APPENDIX 4-M

FEASIBILITY STUDY AND CORRECTIVE ACTION PLAN (SWMU #49)

FEASIBILITY AND CORRECTIVE ACTION PLAN

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SECTION 1

INTRODUCTION

1.1 INTRODUCTION

This Feasibility Study and Corrective Action Plan (CAP) is being submitted in accordance with Section III.D.5 of the Hazardous Waste Facility Permit (Part B Permit) for the Bon L Manufacturing Company, Inc. (Bon L). This CAP is submitted as an application for a Permit Renewal pursuant to 40 CFR §270.14. The permit was issued for post-closure care of four hazardous waste management units (HWMUs): the AlOH Land Treatment Unit, the Chromium Hydroxide (CrOH) Landfill, the Surface Impoundment, and the CrOH Sand Drying Beds. The CAP outlines the steps required to meet the clean-up objectives for corrective action of groundwater stated in 40 CFR §264.100(a) using acceptable engineering methods. The CAP addresses the releases from the HWMUs as well as those solid waste management units (SWMUs) known to have contributed to the two volatile organic compound (VOC) plumes that are otherwise regulated in Section IV.A of the Part B Permit. Although the primary plume of VOC contamination was generated from a degreasing operation (SWMU-49) that existed in the 1950s, this CAP contains steps for the remediation of concerns associated with both of the VOC plumes and both of the chromium plumes. By combining corrective action for the SWMUs that have contributed to the VOC plume and the HWMUs, a more comprehensive, integrated, effective, and efficient treatment scheme has been developed.

In addition to the Part B Permit, Bon L has submitted the following three documents to EPD which are relevant to understanding this CAP:

1. Part B Permit Application, 1992 (including all referenced documents and data),
2. Bedrock Groundwater Investigation Report, 1992, and
3. Stage I PCE/TCE Source Area Investigation, 1993.

This document is divided into five sections, which are as follows:

1. Section 1, Introduction, which provides some brief background information, states the objectives, and outlines the scope of this plan;
2. Section 2, Summary of Monitoring Well Construction, which provides a description of the regional geology and hydrogeology and the local geology and hydrogeology for the site (Most of this information has

been presented in the Part B Permit Application; however, additional information gained from the Bedrock Groundwater Investigation is also included);

3. Section 3, Aquifer and Well Testing, which describes the aquifer testing at the site and summarizes the hydrogeologic parameters measured at the site;
4. Section 4, Groundwater Modeling and Drawdown Analysis, which describes the two groundwater models used at the site; and
5. Section 5, Corrective Action, which discusses various remediation alternatives and describes the proposed treatment systems, the operations and maintenance procedures, the monitoring criteria, the remediation plan, the termination criteria, the schedule for implementation, and the financial assurance requirements.

1.2 PROJECT BACKGROUND

Bon L, a subsidiary of Tredegar Industries, Inc., produces aluminum extrusions for use in residential and commercial construction materials, vehicle manufacturing, and recreational products. The Bon L facility is located in Newnan, Georgia, at 25 Bonnell Street. Plant operations at the facility include a trucking terminal and maintenance area, technical support services, and plant administration. The operations at the site are more fully described in Section B of the Part B Permit Application.

Groundwater monitoring has been conducted at the facility since September 1989. Volatile organic compounds (VOCs) were detected in the groundwater samples collected in January 1990. In 1989 and early 1990, chromium was also detected above the maximum contaminant level (MCL) of 50 micrograms per liter (µg/1) at monitoring wells 2S and 4S.

Monitoring wells 2S and 2D were damaged and removed in 1990 during the partial closure activities related to the former CrOH sand drying beds. New monitoring wells (2SR and 2DR) were installed as replacement monitoring wells in November 1990. As a result of closure of the CrOH sand drying beds, groundwater samples collected to date from these two wells have shown dramatic reductions in chromium. A more thorough discussion of groundwater sampling associated with chromium is included in Section E of the Part B Permit Application.

The primary VOCs detected in groundwater include tetrachloroethene (PCE) and trichloroethene (TCE). Because these compounds are spent solvents presumably from a former degreasing operation, they are classified as an

F001 hazardous waste. Bon L began to investigate the source, extent, and impact of these releases of hazardous constituents in groundwater upon receipt of the certified laboratory reports in late February 1990. All of the certified analytical reports that were received as of June 1992 are also included in the Permit Application. Any reports relevant to the CAP received after June 1992 are included in Appendix A of this report.

1.3 OBJECTIVES

In order to comply with Section III.D.5 of the Part B Permit and because Bon L considers it prudent to protect the environment, Bon L is proposing the corrective actions included in this CAP. The CAP is designed to meet the following goals:

1. to protect human health and the environment,
2. to comply with standards for management of wastes and contaminated media,
3. to achieve media clean-up standards,
4. to remediate the contamination in the groundwater and the source(s) of release to the environment, and
5. to prevent hazardous constituents from exceeding their respective concentration limits at the compliance point by removing the hazardous constituents or treating them in place.

Important considerations in developing this program included a) establishing a remediation and monitoring methodology that would have as a goal definite termination criteria, and b) using the best available technology in an economically feasible manner. As discussed in Section 5, due to the nature of the PCE and TCE and the variability in saprolite hydrogeologic properties, meeting all of the above objectives is difficult.

Site investigations to date have shown three areas of VOC groundwater contamination:

- a small plume of toluene, ethylbenzene, xylenes, and trimethylbenzene (BTEX) on a hillside where a former tank farm was located,
- a plume of PCE and TCE extending from the plant building in a southwesterly direction across West Washington Street to the creek, and
- a smaller VOC plume near the southwest portion of the Surface Impoundment, which was considered to be commingled with the F019

sludge present in the surface impoundment. This plume has been remediated and no longer exits.

The relatively small release of BTEX has been contained and is being addressed through the use of the groundwater collection and treatment system described in Section 5.

Groundwater monitoring has shown that the two VOC plumes are contained by hydrogeological barriers formed by Mineral Springs Branch. Results from the Bedrock Groundwater Investigation also show that the low levels of PCE and TCE detected in BR-3 are contained by this same stream. Because this area is served by a public water supply, groundwater in the vicinity of the site is never expected to be used for domestic or commercial purposes.

In 1993, a small chromium groundwater contamination plume centered around monitoring well 2SR and a small chromium groundwater contamination plume centered around monitoring well 4S extending to West Washington Street also existed at the site.

The two small chromium plumes were limited in extent because chromium is adsorbed to the clay and silt present in the saprolite. Groundwater monitoring since 1998 indicates that the plumes are below detection limit and are no longer present.

1.4 Scope of the Project

The corrective action program mandated by Section III.D.5 of the Part B Permit, and more fully described in Section 5, consists of the following:

1. Sources of PCE/TCE contamination will be remediated.
2. Thirteen groundwater recovery wells will serve as extraction points. Seven wells were installed in accordance with the original CAP. Six additional recovery wells were installed in late 1997 and brought online in early 1998. The locations for all recovery wells are shown in Figure 1.
3. An existing spring containment system and low point collector system will be used to collect contaminated groundwater at the Hillside Area.
4. Two groundwater treatment systems will be used to treat the groundwater to below the Groundwater Protections Standards for metals and VOCs. One groundwater treatment system will consist of sock filters for sediment removal and two carbon adsorption canisters for VOC removal to treat groundwater extracted from RW-1, the Hillside Spring Containment System, and the Low-Point Collector System. The other groundwater treatment system will consist of sock

filters for sediment removal and two carbon adsorption canisters to treat groundwater extracted from wells RW-2 through RW-13.

5. The effluent from the groundwater treatment units will discharge into the Mountain Springs Branch through an existing NPDES permitted outfall.
6. Groundwater monitoring will be conducted at all recovery wells, compliance point wells for the surface impoundment unit/CrOH sand drying beds HWMU and the CrOH landfill unit, and additional wells needed to track the plume.
7. Extraction of contaminated groundwater will continue at all the recovery wells until the groundwater at the compliance point meets the groundwater protection standard.

1.5 SUMMARY OF MONITORING WELL CONSTRUCTION

1.51 Description of Monitoring Well System

All Type II monitoring wells at Bon L have been used for collecting groundwater samples. In addition to the Type II wells, four temporary wells and five additional direct-push probes have been used for collecting groundwater samples to accurately determine the extent of organic compounds in groundwater. Five deep bedrock wells (BR-1 through BR-3, BR-5, and BR-6) were also installed to determine the vertical extent of VOC contamination and test and calculate hydraulic characteristics of the bedrock aquifer.

SECTION 2

HYDROGEOLOGIC SETTING AND EXTENT OF PLUMES

2.1 REGIONAL GEOLOGY

The Bon L site lies in the Piedmont physiographic province of Georgia, which is an igneous and metamorphic geologic terrain. Rocks of the Piedmont are collectively termed bedrock. Over most of the Piedmont, weathering of the parent bedrock has produced an upper veneer of semi-consolidated, sandy, and clayey soils known as saprolite. Residual soil (saprolite) thicknesses vary, ranging from a few feet to as much as 100 feet, depending on the resistance of the original rock type and a number of other factors. Remnant geologic structure (small layering and foliation) within the parent bedrock is often retained within the saprolite.

Regional geologic maps (McConnell and Abrams, 1984) indicate the bedrock of this region lies within the undifferentiated Clarkston Formation. The state geologic map describes this unit as a sillimanite schist. Biotite gneiss, muscovite schist, and amphibolite are also noted in the vicinity of the site.

The Bon L site is approximately 12 miles southeast of the Brevard Fault Zone on the upfaulted, hanging wall side of the thrust fault. The relationship to the fault is important because major fold axes, topolinears, and primary fracture orientation tend to be parallel to or orthogonal to the northeasterly trend of the fault zone.

2.2 SITE GEOLOGY

The primary rock types observed at the site, both in wells, outcrop, and as scattered rock float in soils, are sillimanite schist, biotite-quartz schist, and gneiss of various mineral compositions. Different rock types and their associated geometry occur in a complex pattern over the site. The rocks, or their weathered saprolitic remnants, appear to occur in bands with dimensions ranging from a few inches to several hundred feet in width. With such variability, and with exposures limited to creek banks and split spoon samples (which are difficult to describe in terms of mineral compositions), the exact distribution of rock types cannot be determined accurately. Pegmatites and/or compositional interlayers containing relatively large crystals or grains of muscovite, quartz, and feldspar occur sporadically throughout the area. Veins or compositional layers of quartzite are also present at this site in minor amounts.

Structural measurements were taken at the Bon L site to determine the primary orientation of the rock units in the subsurface because the patterns of rock layering and foliation can affect groundwater flow. The attitude (orientation) of a rock is determined by its strike, which is the direction of a horizontal line placed on a rock layering, and its dip, which is the angle and direction the layering descends vertically into the subsurface. The two measurements define a plane that can be oriented on any horizontal or vertical axis.

In the southwest area of the site, just south of West Washington Street, rock attitudes have a due north-south strike with a dip of 60 degrees east. This measurement was taken in the stream bank between wells OS-3 and OS-5. In the northwest area of the property, near the railroad spur, rock foliation attitudes are N12W with a dip of 56 degrees east. Four structural attitudes were taken near the southeast corner of the polishing pond in a saprolite cut. These values of strike and dip are N13W, 45E; N502, 39E; N30W, 36E; and N-S, 45E (Bedrock Groundwater Investigation Report, 1992). As an approximation, the average rock attitude at Bon L is approximately N15W strike, and 45 degree east dip. However, the overall structural trend at Bon L is apparently part of a syncline or synclinorium that plunges to the northeast. This broad structure is evident on a regional map of the area (see Figure 2-1 from Cressler, et al., 1983). The predominant groundwater flow direction, as verified by the computer model and contaminant plume delineation, is at least partially controlled by the geologic strike at this site.

2.3 POROSITY AND PERMEABILITY

Several factors control subsurface aquifer characteristics, and hence the ability of earth materials to store and convey groundwater. The most significant factors are:

- the depth of weathering,
- the parent rock type,
- the amount of formation contacts or interlayering contacts, and
- the presence or absence of stress-induced fractures.

Groundwater at Bon L is primarily stored and transmitted in the soil and deeply weathered saprolite layers because the underlying bedrock is relatively impermeable compared to this zone. Unweathered crystalline bedrock has a very low intergranular porosity and hence has little capability to store water. However, geologic faulting and unburdening of the rocks can create varying amounts of fractures and joints within the rocks. Such secondary openings can provide a conduit for the transmission of groundwater, although the productivity of individual wells is highly dependent upon fracture concentration and the degree to which the openings are interconnected.

Because of their more granular nature, the overlying residual saprolite and soils of the weathered zone have porosities ranging from about 10 percent to 30 percent, as compared to average bedrock porosities of only .01 percent to 1 percent (Heath, 1980). Therefore, the saprolite has a much higher capacity to store water. In areas where the saprolite is also more permeable than the underlying bedrock, as is the case at the Bon L site, the saprolite layer will store and transmit the vast majority of water moving through the groundwater flow system.

The unsaturated zone and the uppermost aquifer at the site include both soil profiles and deeply weathered saprolite. The shallow soil zone has undergone considerable weathering, which produced a slightly sandy silt overlain by a clayey silt material at the ground surface. This residuum is expected to be relatively less permeable than the weathered saprolite. With increasing saprolite depth, the amount of chemical weathering is less pronounced and the material consists of a silty sand-sized media. This effect is expected to increase both porosity and permeability as compared to the original parent rock.

Porosity and permeability within the underlying bedrock is a function of the amount of fracturing present as well as the amount of formation or interlayer contacts present. Some layers, such as quartzite, undergo little chemical weathering but are mechanically broken up into sandy layers. The presence of these numerous discontinuous, compositionally contrasting interlayers (e.g., 3″ quartz layer, 12″ gneiss layer, 8″ pegmatite layer, 48″ schist layer) within the saprolite is expected to create preferred flow directions in the subsurface oriented along the strike of the foliation. In the lower saprolite, near bedrock, chemical weathering is less pronounced but the effect of compositionally contrasting interlayers is still expected to be apparent.

During the preparation of the Part B Permit Application, a series of in-situ hydraulic conductivity tests (slug tests) were conducted at the Bon L site. Based on this data, the geometric mean of hydraulic conductivity for the residual saprolite (silty sands) is about 1.3 feet per day. Using the range of measured hydraulic gradients and an estimated effective porosity for silty sands of about 0.25 (Fetter, 1981), the estimated groundwater flow velocity ranges from 50 to 150 feet/year (Part B Permit Application, 1992).

There is no discreet hydrogeologic barrier between the saprolite and bedrock aquifer, so the two units are hydraulically interconnected. This is evidenced by drawdown observed in saprolite wells during bedrock well development and purging (EMCON, Bedrock Groundwater Investigation Report).

2.4 REGIONAL GROUNDWATER DESCRIPTION

This section discusses the surface and groundwater behavior on a regional scale, and then more specifically at the Bon L site. Regional trends of recharge and drainage play a major role in understanding groundwater flow at the site.

Groundwater in the Piedmont Province is present in the residual soils and saprolite a few feet to tens of feet below the land surface, and in some areas extends into the underlying crystalline rock. Groundwater usually occurs in pore spaces in the residual soils and in fractures and weathered zones within shallow rock. In deep, unweathered rock, the quantity of groundwater available depends on the number of fractures and the degree to which they are interconnected. Gneiss, schists, and amphibolites may have variable openings and yield small to moderate quantities of water. Zones of greater yield are often related to variations in lithology. Typically, water supply wells in the Piedmont tap the upper 100-400 feet of bedrock and case off the overlying structure.

The Newnan area currently obtains drinking water from two surface water sources: White Oak Creek and Line Creek. Additional water is purchased from the City of Atlanta. However, the City of Newnan used four public water supply wells until 1973. These wells are presently inactive but have not been abandoned. These wells, about 350 to 500 feet deep, were installed into a bedrock (gneiss/schist) water-bearing unit and only yield between 75 and 100 gallons per minute each, which is a low flow rate for municipal water supply wells. Groundwater from bedrock in the Newnan area can potentially be used to supply drinking and irrigation water to some area businesses and residences. Some of the public schools, private residences, country clubs, churches, and private businesses in Newnan have water supply wells on record with the Georgia Geologic Survey (Cressler, et al., 1983). According to the water well inventory included in the Part B Permit Application, over 64 private and commercial wells were on record in the County as of 1983. With the exception of the four inactive Newnan public water supply wells, it is not known how many of these wells are currently active. The water supply wells on record within a one-mile radius of the site are shown on Figure 2. Pertinent information (e.g., well depths, coordinates, date installed, etc.) about the wells shown on Figure 2 is provided in Table 1.

Groundwater recharge is from rainfall percolating downward through the residual soils into the saprolite and/or bedrock aquifer. Groundwater then begins its slow migration to area streams, springs, and rivers, which serve as discharge points. Other than through minor pumping, discharge to these streams and tributaries is the primary mechanism for draining the saprolite groundwater system. Thus the characteristics of area surface water play a definitive role in the flow patterns of groundwater.

Figure 3 illustrates the site’s location with reference to regional area streams. These include a primary tributary to Mountain Creek about 3/4-mile south of the site and a tributary to Little Wahoo Creek northeast of the site. The main stream immediately west of the polishing pond, Mineral Springs Branch, flows into the southern tributary and then into Mountain Creek. All surface water from the area eventually flows into the Chattahoochee River about seven miles northwest of the site. The Newnan Waterworks Lakes, south of Newnan, occur in a separate surface water drainage basin and therefore cannot be affected by discharges from the Bon L site.

As precipitation infiltrates into the ground, a mound in the water table occurs in the intra-stream area between these major regional tributaries. In the Bon L area, the mound should roughly trend, as shown on Figure 3, southeast to northwest. Also, groundwater divides occur along the crest of the water table mounds. These drainage divides separate both surface and groundwater flow from one stream to another in the local area. The suspected regional divides shown on Figure 3 define the individual groundwater basin that includes the Bon L plant. These groundwater divides form the basis of the regional computer model developed in this study.

2.5 SITE GROUNDWATER DESCRIPTION

The uppermost aquifer at the site extends from the groundwater surface (water table) down to competent rock. "Competent rock" is defined here as drill core yielding greater than 90 percent recovery (REC) and greater than 80 percent rock quality designation (RQD). Groundwater occurs at the site under unconfined (free surface or water table) conditions at the site. The water table occurs at depth ranging from about three to 25 feet below the ground surface. Figure 4 illustrates the elevation of the water table in the shallow saprolite aquifer at the site. In general, the "shallow" well data were used to prepare this map; however, selected "deep" wells were also used extensively as an indication of the water table elevation. Exhibit E-2.9 in Section E of the Part B Permit Application presents a listing of all water level data collected from monitoring wells at the site through June 1992.

In general, the direction of groundwater flow is southwest to the main creek along the site/s western boundary. However, the on-site ponds, drainage ditch, and area streams superimpose additional features onto the primary hydraulic gradient. The two ponds, which create a mounding of the groundwater, artificially impose a strong hydraulic head on the groundwater in their immediate vicinity. To the south, water discharged from the ponds and into the groundwater system quickly discharged to the on-site drainage ditch. The closure of these ponds changed the water table and groundwater flow slightly in their immediate vicinity. The on-site drainage ditch appears to receive groundwater along its entire length as evidenced by the "V-shaped" water table patterns.

The observed horizontal hydraulic gradients in the groundwater range from about 0.025 to 0.077 feet/feet (Part B Permit Application, 1992). Both upward and downward vertical hydraulic gradients were observed in groundwater elevations measured in the monitoring well clusters. A downward hydraulic gradient was generally observed in well clusters located adjacent to the settling pond and polishing pond indicating that these recharge groundwater. Upward hydraulic gradients were observed in well clusters located adjacent to creeks, which verifies that groundwater discharges to local streams.

2.6 SUMMARY OF LABORATORY DATA

A large amount of groundwater quality data has been collected by Bon L since September 1989 through the interim status monitoring program, a delisting petition program, Regulated Unit Groundwater Quality Assessment, and additional testing initiated by Bon L to determine the extent of possible groundwater contamination from volatile organic compounds. Almost all of the sampling and analysis at this site has been performed by Analytical Services, Inc. (ASI) of Atlanta. The monitoring program protocol is well documented in Section E of the Part B Permit Application. Sampling and analysis protocol used for the groundwater assessments are described in ASI's Laboratory Quality Assurance Manual.

All of the sample analyses up to June 1992 are included in the Part B Permit Application. For the sake of brevity, only analyses that are pertinent to the CAP and were collected after June 1992 are included in Appendix A of this document.

A more thorough discussion of groundwater testing in the saprolite is included in the Part B Permit Application. Additional testing has been performed 1) to determine the vertical extent of VOC contamination, and 2) to comply with the facility monitoring requirements in the Part B Permit since the application was submitted in September 1992.

2.7 EXTENT OF GROUNDWATER PLUMES

2.7.1 Extent of Chromium Plumes

2.7.1.1 Extent of Chromium Plume Near the Former CrOH Sand Drying Beds

A set of ten samples collected between October 1989 and February 1990 from monitoring well 2S contained chromium concentrations from below detection limit (BDL) to 189 µg/1. The maximum concentrations detected in monitoring well 2D for four sampling events during the same period ranged from BDL to 18 µg/1. These results indicate there was groundwater contamination in the upper part of the shallow aquifer adjacent to the former CrOH sand drying bed unit. The source of this contamination has been attributed to this unit.

More recent lab analyses for chromium in monitoring wells 2SR and 2DR (replacement wells for 2S and 2D) have shown much lower concentrations. Analytical results for chromium in monitoring well 2DR have essentially remained at or below the detection limit. The last year of sampling results for chromium (four events) have ranged from BDL to 12 µg/1, which is only slightly above the detection limit of 10 µg/1. Based on available information, there is no mappable plume of chromium dissolved in groundwater onsite.

2.7.1.2 Extent of Chromium Plume Near the CrOH Landfill

Representative samples from monitoring well 4S contained total chromium concentrations ranging from BDL to 132 µg/1 during fifteen sampling events performed from September 22, 1989 to September 15, 1991. Monitoring well 5S is located downgradient from the CrOH landfill about 110 feet west of monitoring well 4S and is screened at a depth similar to monitoring well 4S. Total chromium concentrations in monitoring well 5S have ranged from BDL to 24 µg/1 for the sixteen samples collected in that same period. Samples collected in January 1993 from monitoring wells 4S and 5S have both been BDL (ASI, Report No. 39930). The CrOH landfill unit has been attributed to be the suspected source of the elevated levels of chromium observed in monitoring well 4S.

Monitoring wells 4S and 5S were closed in 1993. Chromium has not been detected in groundwater samples from monitoring well 4SR, the replacement well for 4S, since installation in May 1993.

The horizontal extent of this plume was delineated by monitoring wells 19S, 19D, and 5S. The vertical extent is defined by the top of monitoring well 4D. The approximate horizontal and vertical extent of this chromium plume as of March 1993 is shown in Figures 5 and 6. At present, the absence of chromium in well 4SR and 19S indicates there is no longer a plume of chromium in groundwater onsite.

2.7.2 Extent of PCE/TCE Plume
2.7.2.1 Primary Source of PCE/TCE Plume

Two primary VOCs, PCE and TCE, are observed in the groundwater. PCE is observed in greater concentrations and with a broader spatial distribution than TCE. PCE in the µg/1 range (generally equivalent to parts per billion) is present in groundwater on-site. The primary source of PCE and TCE detected in groundwater at Bon L were releases from a former degreasing operation at the Bon L plant. Additional sources may include the surface impoundment, the inactive oil/water separator (SWMU-23), and the waste solvent tank (SWMU-7). These possible sources will be addressed during closure of the surface impoundment unit and during the RCRA Facility Investigation (RFI).

An area in the Main Plant Building near the former Number 2 Anodizing operation was dedicated to degreasing. Interviews with plant personnel reveal that the operation included the use of PCE, but not TCE, and operated for two to three years between 1954 and 1957. TCE, however, is commonly a PCE contaminant or a breakdown product of PCE. The former degreasing operation served the function of removing buffing compound (clays, aluminum oxide, and fat) from buffed aluminum prior to anodizing. Buffing is a mechanical process for polishing a metal, but includes the use of buffing compound as a gentle abrasive.

Interviews with personnel indicate the degreasing was accomplished in a steel tank located in a concrete sump. The tank had a small solvent sump in the bottom that was heated to vaporize the cleaning solvent. Buffed aluminum extrusions were lowered into the tank and exposed to the solvent vapors. At the top of the tank were cooling coils that condensed the PCE vapor, forming small droplets of PCE that fell off the metal and back into the sump at the bottom of the pit.

The tank did not have a regular discharge, so it is assumed that spent solvents were periodically cleaned manually and, in the process, spilled inside the former degreasing area, mainly in the sump. This activity is probably the source of the PCE in the groundwater. The spent solvent in the sump probably has leaked slowly into the surrounding soils due to cracks in the concrete. The PCE probably exists as residual dense non-aqueous phase liquid (DNAPL), so direct contact with the pore water is fairly limited due to the absence of rainwater percolation because the unit is housed within the Main Plant Building.

Due to its high Henry's Constant, the spent solvent in the soil would volatilize quickly. Because the spent solvent vapor is significantly heavier than water vapor and has a tendency to diffuse, it probably contacted the water table, then began to dissolve along the top of the groundwater table. This transfer mechanism probably accounts for the low levels of PCE in monitoring well 40D.

From this release, the contaminant plume has migrated about 2800 feet southwesterly, generally following the course of the on-site drainage ditch. However, near the polishing pond, the plume now deviates from the stream course and follows groundwater flow toward the streams south and west of the site.

Some preliminary calculations of vapor phase transport to the groundwater indicate that approximately 0.6 pounds of PCE are transferred to the shallow aquifer per year (Appendix B). This number correlates well with the total mass of PCE in the groundwater. The point of this analysis was not to calculate mass transfer rates, but to establish the former PCE Degreasing Unit as the primary source of PCE at Bon L. This is also evident by inspection of the groundwater plume map shown in Figure .

2.7.2.2 Extent of PCE/TCE Plume

Figure 7 showed the approximate extent of PCE within the shallow and deep horizons of the saprolite aquifer in 1992. Figure showed the approximate horizontal extent of TCE in the shallow and deep wells in 1992.

The vertical extent of the contaminant is considered to be the top of the bedrock throughout most of the plume. In order to define the vertical extent of the VOC contamination, five bedrock wells were installed along the length of the two VOC plumes (BR-1 through BR-5) and one on the southwest side of Mineral Springs Branch (BR-6). The analytical results of groundwater samples collected in the bedrock from these wells indicated VOC levels below the method detection limits (EPA Method 8260) at BR-1, BR-2, BR-4, BR-5, and BR-6. Well BR-3 was drilled near the farthest known downgradient extent of the PCE plume as observed in saprolite wells, in 1992, just downgradient of the off-site wells OS-3S and OS-3D. PCE was detected at 29 µg/1 in the upper bedrock zones between 37.5 and 63.0 feet below ground surface (BGS). PCE was also detected at 19 µg/1 in groundwater samples collected in the interval between 63 and 88 feet, and at 9 µg/1 in the interval between 88 and 108 feet. PCE was not detected in groundwater samples collected in the interval between 160 and 166 feet BGS. Therefore, PCE contamination diminished with depth.

The June 1992 saprolite groundwater sample results and the bedrock sample results were used to determine the horizontal and vertical extent of PCE contamination. In general, the depth of the PCE plume increases with distance from the upgradient source area of the plume. No PCE was detected in the bedrock (well BR-2) near the area of the suspected PCE release. PCE occurs in the uppermost portions of the bedrock and partially weathered rock (PWR) in the mid-sections of the plume (e.g., wells BR-1, BR-4, and BR-5). PCE was detected at depths of up to 108 feet BGS near the downgradient end of the plume (well BR-3). Mineral Springs Branch appears to act as a groundwater boundary in both the saprolite and bedrock. This is evidenced by sampling results from wells OS-5D and BR-6, which are across Mineral Springs Branch relative to well BR-3.

As discussed further in Section 3, the hydraulic conductivity of the underlying bedrock is at least an order of magnitude less than the overlying PWR and saprolite. Also, head gradients between the saprolite and bedrock have only slight differences in head potential (EMCON, Bedrock Groundwater Investigation Report). Therefore, VOC migration into the bedrock has been minimal as evidenced by the results of the bedrock drilling plan.

Differences in contaminant concentrations are observed between wells screened across the water table (shallow) and those wells screened at the top of bedrock (deep). Contamination is generally less widespread in the shallow wells near the water table than in the deeper screened wells. In some situations, only one well existed so this concentration value was used for both the shallow and deep plume maps. The observed variations are related to permeability differences in the subsurface, the distance from the point source, selected removal by shallow streams, and flow along remnant geologic strike as opposed to strictly following patterns suggested by the groundwater gradient. Due to the extremely low concentrations present in the groundwater, however, a significant density contrast does not exist between fresh water and water containing the detected PCE. Therefore, higher observed PCE concentrations with depth are likely the result of groundwater flow patterns and dispersion rather than a "sinking plume."

2.8 SURFACE WATER QUALITY

In July 1990, surface water and stream sediment samples were collected on-site and in streams surrounding the plant property. A total of 21 surface water samples were collected and analyzed for volatile organic compounds. Table 2 summarizes the results of these analyses. Organics were only detected in two general locations:

1. at West Washington Street Branch, a tributary to Mineral Springs Branch, and
2. at groundwater seeps and the on-site drainage ditch between the main plant building and the waste water treatment pond.

West Washington Street Branch bisects the detected PCE plume between monitoring wells pairs OS-1 and OS-3. Due to the relatively small drainage area for this creek and the extremely dry conditions in July 1990, groundwater discharge probably accounted for a major portion of the base flow. PCE was detected in surface water sample in concentrations of 3 µg/1 to 7 µg/1. A sample was also collected from a small groundwater seep in the stream bank. This also had detectable levels of PCE (3 µg/1). Although these concentrations are very low and close to or below the drinking water standard of 5 µg/1, these data support the conclusion that groundwater discharges to streams in this area.

On October 20, 1992, additional surface water samples were collected on-site and in streams surrounding the plant property. A total of ten surface water samples were collected and analyzed for benzene, toluene, total xylenes, trichloroethylene, and percholoroethylene. Table 2 summarizes the results of these analyses. Of these samples, only the samples collected at the seep near the storm sewer pipe, the spring, and West Washington Street Branch contained any of the above listed compounds.

A comparison of the 1992 data to 1990 data yields the following:

1. 1992 data from the on-site drainage ditch shows much lower concentrations than in 1990 due to the installation of the Hillside Treatment System which is operating effectively. This system is capturing the spring effluent and contaminated groundwater emanating from near the solvent tank farm area.
2. PCE and TCE concentrations within West Washington Street Branch have remained steady.
3. PCE and TCE concentrations within Mineral Springs Branch have remained BDL.

Additional surface water data is available to add here

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The seeps and surface water in the "Hillside Area" between the main plant and settling pond contained much higher levels of PCE as well as toluene, xylene, and ethylbenzene. Due to the steep ravine, groundwater flowing under the plant discharges to the on-site drainage ditch in this area. This is the center, or area of highest concentration, of the PCE groundwater plume. PCE was detected in one seep sample at 506 µg/1. The other organics detected in these samples were released from SWMU-7 and SWMU-46 located at the top of the ravine. Soil and soil gas samples from around the SWMUs also indicate that a release has occurred from this source. This is discussed further in Section 4.6 and in Appendix L-10 of the Part B Permit Application. Because of the relatively high levels of organics detected in this area, Bon L immediately implemented interim corrective measures to contain and treat this water. This project is discussed briefly in Section 5-4.

2.9 DRINKING WATER WELL QUALITY

As discussed in Section 2.4, a few private drinking water wells are located within one mile of Bon L. They will not be affected by the organics because they are located beyond the natural streams that contain the PCE plume and are not downgradient of the plume. The three closest wells were sampled and analyzed for volatile organic compounds. No VOCs were detected in these wells.

Laboratory reports for these samples are included in the Part B Permit Application.

SECTION 3

AQUIFER AND WELL TESTING

3.1 INSTALLATION OF TEST WELLS

Test well DW-1 was installed just south of the inactive oil/water separator (SWMU-23) on November 23, 1992. The well was drilled to a depth of 42 feet and screened with four-inch diameter, 0.010-inch slotted PVC screen. Four piezometers, PZ-1, PZ-2, PZ-3, and PZ-4, were also installed to observe the drawdown.

Test well DW-2 was installed southeast of monitoring well 4S on December 7, 1992. The well was drilled to a depth of 31 feet and screened with four-inch diameter, 0.010-inch slotted PVC screen. Two piezometers, T-5 and T-6, were installed to observe the drawdown in the aquifer during pumping of the test wells.

Test well PW-1 was installed near former monitoring well 2S by ATEC in March 1990. This well was completed with a six-inch diameter screen to the bottom of the shallow aquifer. Six piezometers, PZ-1 through PZ-6, were also installed.

Construction diagrams and boring logs for wells DW-1 and DW-2 are included in Appendix B. No construction diagram or boring log was available for test well PW-1.

3.2 STEP PUMPING TESTS

3.2.1 Step Pumping Test Methodologies

Test well step testing was accomplished between December 2 and 11, 1992. Water level measurements were obtained using electric well probes in the recovery well. All water removed during the step testing was treated by the carbon adsorption unit prior to discharge to the existing NPDES outfall.

Pumping was performed in test wells DW-1 and DW-2 using a one-third horsepower (hp) submersible pump. Well PW-1 was tested by ATEC in March 1990 and no step test data is available. Well DW-1 was pumped at increasing rates of 0.2, 0.3, and 0.85 gallons per minute (gpm) for a period of approximately one-half hour for each step. Well DW-2 was pumped at increasing rates of 1, 2, 5, 7.5, and 8 gpm for a period of about 20 minutes for each step. Table 3 summarizes the data on the step testing.

3.2.2 Step Testing Results and Analyses

Pump test data collected from the two step tests were used to estimate optimum pumping rates for each recovery well. The data were also used to obtain preliminary estimates of aquifer parameters.

The step test data were evaluated by plotting the drawdown(s) versus the pumping rate. The efficiencies were calculated by dividing the pumping rate by the drawdown. The efficiency in well DW-1 remained constant, probably due to the low flow rates. The efficiency in DW-2 was reduced at pump rates above 7 gpm. Drawdown data and plots from each pumping well are included in Appendix B.

Step test results indicate the heterogeneous nature of the saprolite at the facility. The aquifer transmissivities were calculated between 9.1 and 9.4 ft2/day and 662 and 663 ft2/day for DW-1 and DW-2, respectively. An area of low transmissivity sediment appears to exist near test well DW-1. Estimated aquifer parameters derived from step test data were consistent with those derived from both slug testing and constant rate (48-50 hours) aquifer tests.

3.3 CONSTANT RATE AQUIFER TESTS

3.3.1 Constant Rate Aquifer Test Methodologies

Constant rate aquifer tests were performed on test wells PW-1, DW-1, and DW-2 to refine estimates of aquifer parameters (transmissivity, hydraulic conductivity, and storativity). The locations of these wells and their associated observation wells (existing monitoring wells) and piezometers are shown on Figure 9.

Test well PW-1 was tested at a rate of approximately 0.5 gpm for a period of 51 hours between March 9 and 10, 1990. During well PW-1 aquifer testing, water levels were recorded using an electric well probe at monitoring wells 2S and 2D, and piezometers PZ-1, PZ-2, PZ-3, PZ-4, PZ-5, and PZ-6. After pumping ceased, water levels were monitored for a period of 26 hours. Test well PW-1 and all the associated piezometers have been properly abandoned.

Test well DW-1 was tested at a rate of approximately 0.45 gpm for a period of approximately 67 hours between December 3 and 5, 1992. During well DW-1 aquifer testing, water levels were recorded using an electric well probe at monitoring wells 29S, 29D, 47S, and 10S and piezometers T-1, T-2, T-3, and T-4. Due to the low transmissivity and the test being affected by rain, none of the monitoring points showed a significant drawdown.

Test well DW-2 was tested at a rate of approximately 7 gpm for a period of approximately 48 hours between December 18 and 20, 1992. During this aquifer test, water levels were monitored using electric well probes at monitoring wells 4S, 4D, 5S, 17S, 17D, 18S, 18D and piezometers T-5 and T-6. After pumping ceased, water levels were monitored for a period of 41 hours.

3.3.2 Constant Rate Aquifer Test Results and Analyses

The constant rate aquifer pump test data were evaluated using methods developed by Cooper and Jacob (1946) and Theis (1935). Analyses for each of these methods were performed graphically from semi-long plots and log-log plots. Results of the analysis are summarized on Table 4. All pumping recovery data are included in Appendix B.

Transmissivity and storativity estimates from the PW-1 test were calculated using drawdown data from piezometers PZ-4 and monitoring well 2S. Transmissivity values ranged from 27.4 ft2/day to 22.3 ft2/day; storativity values varied from 8.5 x 10^{-4} to 3.5 x 10^{-3}, respectively. The capture zone for this test is shown in Figure 10.

Only the transmissivity was estimated from the DW-1 test, since drawdown data in the surrounding observation points were unreliable due to rain and man-made heterogeneities in the subsurface. Apparently there was once a gravel road traversing the area where DW-1 is located, the top of which is located about three to four feet below the present ground elevation. There may also be other man-made subsurface features in this area because the inactive oil/water separator is located about 20 feet northeast of DW-1.

The transmissivity and storativity values from the DW-2 test were calculated using drawdown data from piezometers T-5 and T-6. Transmissivity values ranged from 745 ft^2/day to 586 ft^2/day; storativity values varied from 2.1 x 10^{-2} to 1.6 x 10^{-2}, respectively. The high transmissivity in this area is probably due to the degree of weathering in the saprolite. The saprolite in this area is weathered gneissic material that still exhibits layering and foliation. The layers are oriented so the horizontal hydraulic conductivities are greater than the vertical hydraulic conductivity. A triaxial conductivity test was performed by Chattahoochee Geotechnical Consultants. The vertical hydraulic conductivity of the sample was determined to be only 2.05 x 10^{-6} cm/sec. This is about three orders of magnitude less than the horizontal hydraulic conductivity. The capture zone for this test is shown in Figure 11.

3.3.3 Water Quality Sampling and Analyses

Water samples were collected at DW-1 and DW-2 at the beginning of the aquifer test and every 24 hours thereafter. The samples were analyzed for permit VOCs (EPA Method 8260) (i.e., PCE, TCE, toluene, vinyl chloride, ethylbenzene, 1,1-dichloroethene, and total xylenes). Laboratory reports are included in Appendix A.

Results of the four samples collected from DW-1 indicate that the only permit VOCs present in the groundwater were PCE and TCE. The first sample contained 120 µg/1 of PCE and & µg/1 of TCE. The three subsequent samples showed PCE ranging from 280 to 300 µg/1 and TCE ranging from 12 to 14 µg/1. This is consistent with a groundwater sample collected in June 1992 from monitoring well 29D, which contained 380 µg/1 of PCE (Report No. 35645-24), and the last groundwater sample collected in June 1990 from monitoring well 29S, which exhibited 103 µg/1 of PCE (Report No. 21773-48).

Results of the three samples collected from SW-2 also indicated that the only permit VOCs present in the groundwater were PCE and TCE. The initial sample contained 70 µg/kg of PCE and 10 µg/kg of TCE. The other two samples contained levels of PCE ranging from 10 to 80 µg/kg and TCE staying steady at 10 µg/kg. These levels are also consistent with recently collected samples from monitoring well 4S, the closest monitoring well to DW-2.

Since DW-2 was located in the chromium plume, a sample was collected during the beginning of the test and analyzed for chromium. Results indicated that the level of chromium was BDL.

3.4 SLUG TESTING

Slug testing was performed at the site on December 23 and 26, 1992. Testing was performed using an In-situ Hermit Data Logger and its associated transducers. Tests were performed on 11 existing monitoring wells and test wells DW-1 and DW-2. All of the wells tested were located within existing plumes. The average hydraulic conductivity value was calculated to be 3.9 ft/day using the Bouwer and Rice Method. The minimum value was 0.08 ft/day and the maximum value was 19.77 ft/day at wells 26S and 7S, respectively.

Previous hydrogeologic conductivity tests (slug tests) for the residual soils at the site were performed for the Part B Permit Application. The maximum and minimum values obtained during these tests were 4.9 ft/day at well 9S and 0.05 ft/day at well 9D, respectively. The average value obtained was 2.5 ft/day. All of the slug test data performed to date is summarized in Table 5.

Very good correlation was obtained when comparing the slug test data to the aquifer test data. At test well DW-1, values of 0.25 ft/day and 0.22 ft/day were obtained during the slug test and aquifer test (single borehole, using Hvorslev's Method), respectively. At test well DW-2, values of 13.4 ft/day and 31.6 ft/day were obtained during the slug test and aquifer test (average of two tests), respectively.

3.5 BEDROCK AQUIFER TEST DATA

Compressed air was used to remove water from the bedrock wells during well development and purging. With a constant flow of air, water was produced from the well at the same rate fractures recharged the well. Following this approach, several hydraulic conductivity determinations were also made during the air lift purging, assuming that drawdown was equal to the approximate depth of the static water column in relation to the base of the hose, and that pseudo steady-state flow conditions existed.

Hydraulic conductivity values were determined at various zones in bedrock wells BR-2, BR-3, BR-4, and BR-5 (EMCON, Bedrock Groundwater Investigation Report, 1992). The highest conductivity value, 0.26 ft/day, was observed in BR-3 at an interval of 63 to 88 feet BGS. The lowest value, 0.017 ft/day, was observed in well BR-5 between the depths of 85 and 109 feet BGS. Of course, intervals of these wells that contained no productive fractures had no measurable conductivity at all. In general, the bedrock is relatively unfractured and has a hydraulic conductivity approximately an order of magnitude less than the saprolite.

3.6 PSEUDO STEADY STATE HYDRAULIC CONDUCTIVITY TESTING

Additional hydraulic conductivity data was previously obtained during the preparation of a report entitled "Assessment of Potential Sources of Release of Volatile Organic Compounds" (EMCON, 1991). Hydraulic conductivity values observed with the surficial aquifer during this testing varied from a maximum value of 19.8 ft/day for well 17S to a minimum value of 3.3×10^{-2} ft/day for well 3S. Results of this testing are summarized in Table 5.

3.7 LABORATORY DETERMINATION OF THE RETARDATION COEFFICIENT

To determine of soil adsorption characteristics affect the PCE distribution and transport within the aquifer, a series of analytical tests were performed on soil samples from DW-1 and DW-2. After an extensive literature review, batch testing was selected as the most reliable method to determine the adsorptive characteristics of the soils. The general concept is to apply a known concentration of PCE to a known mass of soil and then determine how much PCE is removed from the solution by adsorption onto the soil material. Columbia Analytical Services (CAS) was contracted to perform this analysis. The CAS report and retardation coefficient calculations based on the report data are included in Appendix B.

A series of batch tests were performed by mixing varying proportions of soil with a known concentration of water spiked with PCE. The mass of PCE adsorbed per mass of soil was determined by subtracting the equilibrium concentration of PCE from the initial concentration of PCE and multiplying this difference by the total volume of the solution added. The ultimate objective of this test was to obtain the Kd value from the Freundlich isotherm. The Freundlich isotherm is applicable where adsorption onto a solid phase is proportional in a log distribution of the solute concentration.

The data obtained from the batch test was plotted as a function of the equilibrium concentration against the mass of PCE adsorbed per gram of soil. Data points should form a linear relationship when plotted log-log, provided equilibrium concentration times have been achieved. Once these data are plotted, the slope is used in the Freundlich isotherm equation to solve for Kd, the mass partitioning coefficient, which is the mass of PCE adsorbed per mass of soil divided by the equilibrium concentration. In more practical terms, the Kd value is the amount of contaminated solution that passes through a given mass of adsorbing media.

The measured Kd value was then used to obtain a retardation coefficient for PCE in the soils. The retardation coefficient is an indication of the amount of water containing a specific solute (PCE in this case) that must pass through a given media (soil) so that 50 percent of the initial concentration is observed at the boundary of the flow region. The retardation coefficient (R) is the ratio of the velocity of water flowing through an aquifer with respect to the velocity of the contaminant flowing through the aquifer. The relationship between R and Kd is expressed as

where:

- = velocity of water from unit,
- V = velocity of contaminant from unit,
- = bulk density,
- n = porosity, and
- = mass partitioning coefficient.

When R equals 1, there is no retardation. When R exceeds 1, retardation is observed. The higher the value of R, the higher the retardation.

The laboratory Kd values calculated for the soils at DW-1 and DW-2 averaged about 0.6 ml/g. The corresponding retardation coefficient (R) for PCE in the soil samples was determined to be 3.4. This means that the cleanup of this type of aquifer will take at least three times as long as an "unretarded" contaminant.

A similar type of solid-water partitioning analysis was undertaken using a soil sorption coefficient. The most common soil sorption relationship is the Koc coefficient, which is based on the sorptive capabilities of organic carbon.

Once the organic carbon fraction (foc) is known for a particular soil or sediment, the following relationship can be established:

The foc value for soil collected at 25 feet BGS at test well DW-1 was 0.0013 and at the same depth in DW-2 was 0.0015. Using an after foc value of 0.0014 and a Koc value of 359 yields a Kd of 0.5. The retardation factor using this Kd value is 3.0. The Kd values are very similar when using this analysis method and the batch testing method described above.

SECTION 4

GROUNDWATER MODELING AND DRAWDOWN ANALYSIS

4.1 INTRODUCTION

As a part of the groundwater investigation, two groundwater models were used. The first, the SWIFT III model, was originally developed for Sandia National Laboratories by three consulting firms (Intercomp, Inc., Intera, Inc., and Geotrans, Inc.) over a ten-year period. The SWIFT III model was used to calculate discharge into the surrounding surface water bodies. The second, the MODFLOW model, was used to calculate the capture zone of the proposed groundwater collection system. Although this can be done by hand, the model simplified the calculation process.

The role of the models was to provide quantitative answers of sufficient accuracy to guide the decision-making process for groundwater monitoring and remediation.

4.2 SWIFT III MODEL DEVELOPMENT

4.2.1 Regional Flow Modeling

The existing database at the site includes 94 monitoring wells and several rounds of sampling and water level measurements. Except for 16 wells, all data lie within the boundaries of the site. Additional regional groundwater system factors that have a controlling influence on groundwater movement and contaminant migration at the site must also be considered. To incorporate the regional effects, two flow models are employed. The first is a regional-scale model extending over a wide area. While data on this scale are limited, a reasonably accurate simulation of the regional groundwater system has been obtained. Subsequently, a local-scale model is constructed within the overall framework of the larger model. The local model includes most of the Bon L property and areas outside of the site that are potentially affected by the groundwater release from the plant. Water level data computed by the regional model were used to establish the outer boundary conditions for the local scale model. In this way, the site area could be modeled with much higher resolution than would otherwise be possible, while transferring the characteristics of the regional three-dimensional flow system into the local scale. A further description of this process and the regional model results is contained in Appendix C.

4.2.2 Local Scale Groundwater Flow Modeling

In the first phase of the modeling analysis, regional and local-scale flow models were developed and calibrated to simulate the present average annual (steady-state) groundwater levels within the site area. During the calibration process, model parameters were adjusted until a reasonable reproduction of the observed water level pattern was obtained. This process also enabled the determination of the model's relative sensitivity to a range of hydraulic conductivity and recharge infiltration values.

Of these two parameters, recharge appears to be the most sensitive in this model. A final value of four inches per year was selected. This is considered to be a reasonable value given the hydrologic characteristics of the site and the estimated infiltration rate based on precipitation, runoff coefficient, and evapotranspiration rate in this area.

Hydraulic conductivity was less sensitive in this model. A value of one ft/day was found to provide the most reasonable amount of subsurface drainage within the saprolite aquifer. This hydraulic conductivity estimate is consistent with recent aquifer tests conducted at the site discussed in Section 3.

The finite-difference computer grid for the local model is shown in Figure 12. Each rectangle in the grid represents a model cell, each of which can be assigned a set of hydraulic characteristics representative of the aquifer. In plan view, the local model consists of 53 "i" coordinate cells and 43 "j" coordinate cells. In cross-section, three cells are stacked on top of one another in order to break the saprolite aquifer up into three depth horizons extending from the approximate water table to the bedrock. Therefore, layer thicknesses and elevations vary according to the thickness of the aquifer and the depth of bedrock across the model area. The blacked out cells in Figure 12 are the computer representation of area streams and ponds. The orientation of the "j" axis, along a north-northwest direction, coincides with the approximate average geologic strike.

From the model, the calculated water levels in the upper aquifer are shown in Figure 13. This compares very favorably with the potentiometric surface from monitoring wells. The small arrows in Figure 13 indicate the groundwater flow direction (one should look at the general trend indicated rather than each individual arrow). In ideal circumstances (in a homogenous aquifer), the flow direction is by definition perpendicular to the water level contours. However, in a heterogeneous aquifer, groundwater flow may not follow this rule precisely. In an attempt to simulate the heterogeneous effects of geologic strike within the saprolite, a 2:1 anisotropy was introduced in the model, with the strongest permeability component aligned with the "j" axis of the model (coincident with the approximate average geologic strike). This produces the slight southerly angle the arrows have in Figure 13 relative to the water level contours.

Some trends shown in Figure 13 are also forced to occur, based on knowledge of the groundwater system. One occurs when a section of a stream receives or produces groundwater. The trend will depend upon the stream elevation supplied to the model. While most stream reach elevations are well-defined, the section of the drainage ditch adjacent to the polishing pond is particularly sensitive. In the area of the small dam (road) just southwest of the polishing pond, a change of stage in the ditch of only a few inches can determine whether groundwater is discharged to the ditch or the ditch discharges to the groundwater. A stream stage that produces infiltration from the stream to the aquifer in a southerly direction in this one area was used in the model. This decision was based on the contamination pattern observed, which shows movement away from the ditch in the immediate western pond area.

The groundwater flow arrows (vectors) of Figure 13 indicate that Mineral Springs Branch along the western site border receives groundwater from both sides, while the drainage ditch (along the ponds) and West Washington Street Branch apparently receive water only from the north, and also from the upper portion of the aquifer. Water appears to flow underneath these smaller creeks on its way to Mineral Springs Branch. This condition is produced mainly by the fact that Mineral Springs Branch lies at a considerably lower elevation than the other streams, and because West Washington Street Branch and the drainage ditch do not penetrate significantly into the aquifer. Mineral Springs Branch acts as a hydrologic barrier to the plume. This is supported by groundwater monitoring performed at wells located on the western side of this stream. Figure 14 shows the behavior of groundwater flow in a cross-sectional plane across West Washington Street Branch and Mineral Springs Branch (from Figure 12, along the j = 32 line of cells).

Figure 15 illustrates the relative amount of groundwater discharge (or recharge) to each of the area streams and ponds as computed by the SWIFT III flow model at the local scale. The numbers shown represent maximum values. Silting of the stream beds, a parameter not incorporated into the model, most likely will inhibit the actual amount of water moving into and out of the streams. For analysis purposes, the drainage ditch and Mineral Springs Branch have been broken up into several stream reaches.

The drainage ditch has a net gain along all three reaches considered. The two reaches along the polishing pond (B and C) probably both receive equal amounts of water from the pond. However, considering flow to and from both sides of the ditch, the middle reach (reach B) gains significantly less than the upper section. The difference (11.2 gallons per day per foot) represents the loss of water southward into the aquifer in the vicinity of the small dam.

Mineral Springs Branch, along the western site boundary, is broken up into three stream reaches. The upper reach (reach B) receives the greatest amount of groundwater. This is due in part to the relatively large hydraulic gradients produced by the polishing pond toward this portion of the creek. The lower portion of Mineral Springs Branch (reach G) receives slightly more water than the middle section. This is likely due to increased aquifer thickness in this area.

4.3 DEVELOPMENT OF THE MODFLOW MODEL

MODFLOW is a finite difference groundwater model developed by the United States Geologic Survey (USGS) to simulate groundwater flow under many different conditions. The model calculates head values, specific discharges, and volumetric total discharges at user specified time increments. User definable input includes evaporation, recharge, constant heads, aquifer thicknesses, aquifer hydraulic conductivities, number of layers, discharge wells, drains, and no flow boundaries. The MODFLOW model is distributed by the USGS Water Resources Division. All of the calculations and notes used to calculate the capture zone are included as Appendix C.

MODFLOW calculates head values at specified locations in a finite difference grid. The grid consists of rows, columns, and layers. At the Bon L site, a local area grid consisting of 35 rows, 35 columns, and one layer was used. In this case, local means that only a localized portion of the entire site was evaluated at any one time.

This grid was used to simulate drawdowns in the saprolite aquifer at each location where a discharge well is planned. The grid consists of 60-foot wide rows and columns near the outer edges. At the interior of the grid, where a discharge well is located and the aquifer drawdowns are the greatest, the rows and columns are two feet wide. This grid spacing allows for a higher resolution or degree of accuracy near the center of the local grid during each drawdown calculation. The horizontal dimensions of the Bon L MODFLOW local grid are 880 by 880 feet. However, the vertical thickness of the aquifer layer varied for each modeled area.

The saprolite aquifer thickness was contoured across the majority of the Bon L site where the model simulations were planned. From the aquifer isopach map, it was possible to select a single aquifer thickness for each model run. This thickness was selected at each location to most accurately represent the aquifer conditions in the interior potions of the local model grid.

Hydraulic conductivity values are also required as input into the MODFLOW model. Aquifer hydraulic conductivities have been determined from slug tests and aquifer tests at numerous locations across the site. The values were plotted on a site map and contoured to extrapolate between known values. Using this data, it was possible to select a single hydraulic conductivity value that most accurately represents aquifer conditions near the middle of each model simulation.

Streams and ponds at the site corresponding to grid cells required special consideration. Most streams at the site are constant head boundaries that do not vary during the model simulation. Stream elevations were determined from a topographic map and input into the MODFLOW model as constants. West Washington Street Branch was not considered a constant head in one simulation center on West Washington Street Branch near the confluence with Mineral Springs Branch because this well placement will dry up the seasonal West Washington Street Branch.

Additionally, the two ponds on site are not considered true constant head boundaries since earlier investigations have determined that they are not in direct hydraulic connection with the underlying saprolite aquifer due to the bottom accumulation of aluminum hydroxide sludge which was once treated within the two ponds. Therefore, where a local grid overlapped a pond at the site, only a few of the grid cells were selected as constant heads.

In general, the pond constant head cells were selected near the center or uppermost reaches of the pond. This placement of constant heads near the centers of the ponds most accurately portrayed site conditions. This would also have the effect of maintaining some head under the pond while having a minimal effect upon discharge simulations. When ponds were treated as true constant head boundaries, calculated head values did not accurately portray site conditions. The ponds, as of January 1993, are in the process of closure and will be dewatered within approximately one year. This treatment of the ponds as "semi-confined" also helped to portray conditions as they will exist after the ponds are closed.

The MODFLOW model was used to calculate head values at the center of each cell within the local grid. Two solution techniques are possible with the MODFLOW model. For the Bon L simulations, the strongly implicit procedure (SIP) was used repeatedly until the model head values stabilized. Approximately 25 to 50 SIP iterations were required for each model simulation to converge on a stable answer.

Output from the MODFLOW model includes input arrays, output arrays, and water budgets. Twenty-one values were selected from the output arrays and tabulated for comparisons with actual field values of hydraulic head. From this simplified tabulation, it is observed that the simulated head values most accurately represent field conditions around the center cell (i.e., cell 18, 18) of each grid. This was expected because aquifer parameters were selected to provide the greatest accuracy near the center of each local model.

Two simulations, one termed steady-state and the other termed discharging or pumping, were conducted at each local grid location. The steady-state model run was conducted to simulate the aquifer without the presence of a discharge well. Another simulation was conducted with a discharge well located at the center of the local grid (cell 18, 18). Differences between these two model simulations were tabulated for each local grid and used to determine the simulated drawdowns from discharging wells at different distances from the discharge well.

Simulated drawdowns from each local model were plotted on a site map. Where two grids overlap, simulated drawdowns may overlap and increase the effective drawdown in that area. The law of superposition states that the drawdowns are cumulative where they overlap. After plotting the drawdown values and adding any cumulative drawdowns, the aquifer drawdowns were contoured for the entire Bon L site. The August 21, 1992 water table map was overlaid on top of the drawdown map and redrawn to account for aquifer drawdowns during a simulated recovery operation. Although the actual water table may vary, using the results of the steady-state and discharging or pumping simulations, drawdown is relative and the starting water table elevation is not important. Groundwater flowpaths were drawn on the revised recovery water table map to determine groundwater capture zones.

SECTION 5

CORRECTIVE ACTION

5.1 INTRODUCTION

The Corrective Action Plan deals with three areas: the PCE/TCE groundwater plumes, the chromium groundwater plumes, and the Hillside Area. Natural and man-made measures can act to protect groundwater resources. These include physical features such as area streams, which by intercepting and receiving groundwater, serve as natural hydrogeologic boundaries. At Bon L, Mineral Springs Branch forms this natural boundary. Within a contaminant plume, the natural processes of adsorption and dispersion act to reduce contaminant concentrations. Active measures that can augment these natural processes include source control and groundwater recovery and treatment.

The most important aspect of the remediation is to contain or treat the sources of contamination (or at least mitigate their impact to groundwater). For chromium, one of the sources has been controlled by closing the former CrOH sand drying beds. Although clean closure could not be achieved, the bulk of the contaminant was excavated and properly disposed. This is evidenced by the significantly lower groundwater concentrations observed in wells 2SR and 2DR. The former CrOH landfill, which has been attributed to be the other suspected source of chromium, is scheduled to be closed by constructing an HDPE cap over the landfill as mandated in Section II.D of the Part B Permit. The identification and delineation of PCE/TCE sources during the RFI will allow for timely and efficient source removal.

Closure of SWMU 7/46, the Tank Farm Unit was certified in January 1999. A remediation system at that location was installed in late 1997 and brought online in early 1998.

This section describes available source control techniques, groundwater recovery and treatment techniques, and wastewater disposal options. It evaluates each alternative and describes Bon L's proposed remediation measures to meet the groundwater protection standards set forth in the Part B Permit. It also describes Bon L's proposed monitoring plan and termination criteria and projects remediation time frames. Finally, it describes Bon L's reporting methods and the proposed implementation schedule.

5.2 DESIGN CONSIDERATIONS

The corrective action program was developed based on the following conclusions resulting from assessing the groundwater at the site:

1. the primary source of release of PCE and TCE was from the degreasing operations conducted between 1954 and 1958,

2. no public health risk to existing local groundwater users exists due to the direction of groundwater flow and the natural plume boundaries formed by "gaining" streams in the plant area,
3. laboratory analyses of samples verify that no water supply wells have been affected,
4. the entire depth or column of the saprolite aquifer is assumed to be contaminated by PCE and TCE in areas where the PCE/TCE contaminant plumes exist,
5. only the uppermost column of the saprolite aquifer is contaminated by chromium in areas where the chromium plumes exist,
6. the center of the plume will move about 30 to 90 feet per year,
7. bedrock serves as a vertical barrier to plume migration for most of the site with the exception of the southernmost part of the PCE/TCE plume, and
8. Mineral Springs Branch serves as a horizontal hydrogeologic barrier to the plume.

In addition to the remediation objectives stated in 40 CFR §264.100, the CAP should:

1. use proven technology and readily available standard equipment and methods,
2. achieve the remediation objective at the point of compliance in the shortest reasonable period of time,
3. provide a permanent remedy, if possible,
4. comply with other relevant environmental standards and permits,
5. provide an economically feasible solution, and
6. minimize maintenance problems, thereby improving overall system performance and effectiveness.

5.3 CORRECTIVE ACTION ALTERNATIVES

The proposed corrective action system includes:

1. removing contaminated groundwater with a dewatering system and pumping the water to a central location,
2. processing the water through an on-site treatment system to remove volatile organic and metal contaminants,
3. disposal of the treated effluent in an acceptable manner, and
4. remediating known sources of contaminants.

The following is a discussion of implementation of these alternatives in each area of concern.

5.4 HILLSIDE AREA

5.4.1 Interim Corrective Measures for the Hillside Area

As discussed in Section 2, volatile organic compounds were detected in seeps and a spring from an embankment between the Main Plant Building and the settling pond. This area, a steep embankment referred to as the Hillside Area, is where the on-site surface drainage ditch originated in 1990. Before the plant was built, this ditch extended further north under the present location of the plant building. In 1990, a stormwater drainage culvert entered the ditch at this location. This culvert drained runoff from the plant property and parking area, as well as residential and commercial areas north and east of Bon L. The storm drain was extended further downstream in 1990.

Groundwater in the Hillside Area contains concentrations of xylene, ethylbenzene, and toluene related to releases from SWMU-7 and SWMU-46; and concentrations of PCE related to releases from SWMU 49. This water has the highest reported concentrations of VOCs at the site. The total VOC concentration of the influent is about 500 to 700 µg/1, and the major compounds are PCE and toluene. After discovering this source of VOCs, Bon L began to implement the following immediate corrective measures to control this release:

1. measures to prevent additional soil contamination (source control),
2. placement of absorbent “socks” across the ditch,
3. isolation of the contaminated soil from the stormwater management system,
4. collection and removal of organics before they contact surface water, and
5. studies for remediation beyond source control, described in the Draft RFI Workplan.

The EPD was notified of these immediate corrective actions in a letter from Bon L to Mr. Mark Smith dated August 17, 1990.

After the above corrective measures were implemented, the Hillside Area was modified to route stormwater away from the seep and to collect and treat contaminated groundwater in an oil water separator and a carbon adsorption unit. The interim corrective actions included capturing the “spring” and other seepages, routing stormwater drains to points beyond the Hillside Area, and installing pumps and controls in the Hillside Area just south of the main plant building. The influent flow rate varies in relation to rainfall, but averages about 13 gallons per minute (gpm). The collected water is pumped through a carbon adsorption unit located at the wastewater treatment plant. This system has been in operation since July 1990. Influent to the unit is collected at two locations: a low point collector (LPC) and the spring. These collection points captured most of the shallow groundwater in the Hillside Area. Sample results indicated that this unit facilitated removal of PCE and other VOCs to below detection limits. The effluent met drinking water standards.

5.4.2 Additional Corrective Measures for the Hillside Area

The corrective action measures described in Section 5.4.1 effectively captured groundwater in the Hillside Area. Therefore, Bon L continues to collect groundwater discharge from the Hillside Area for treatment in the selected groundwater treatment system as described in Section 5.6.2.2.

Additionally, source control for the Hillside Area was investigated during the RCRA Facility Investigation. The RFI Workplan was submitted to EPD under separate cover.

5.5 SOURCE CONTROL

Section 5.5 describes techniques that Bon L has and will implement to control sources of chromium, PCE, and TCE, as well as VOCs associated with SWMUs 7 and 46. Section 5.5.1 describes Bon L's proposed PCE/TCE source control techniques. First, the investigation steps that Bon L has and will undertake to define contaminant distribution at the source are discussed. Second, available soil treatment options for remediation of the source are described. Third, the effectiveness and feasibility of each option are analyzed and a specific treatment option is chosen based on those analyses. And finally, Bon L proposes an implementation plan for PCE/TCE source control and remediation that has and will continue to be implemented as discussed below.

Section 5.5.2 then describes steps that Bon L has undertaken to control sources of chromium. Because chromium source control has been addressed by the closure of the CrOH sand drying beds and the CrOH landfill, Section 5.5.2 provides a brief description of chromium source control.

Section 5.5.3 describes steps that Bon L has undertaken to control sources of VOC from SWMUs 7/46.

5.5.1 PCE/TCE Source Control

Preliminary calculations based on data collected during the Stage I PCE/TCE Source Area Investigation indicate that the mass of the PCE contained within the plumes can be attributed to the former PCE Degreasing Unit. The calculations are shown in Appendix B.

These calculations were performed by determining:

1. Henry's Constant (H) of PCE (ratio of vapor concentration and liquid concentration),
2. the area of the 1000 ppm and 100 ppm concentrations of VOCs (the area contained within the 10.0 ppm contour was excluded from the calculations),
3. the concentration of PCE in the porewater using the relationship of CW = Cg/H, where,

    - CW = porewater concentration (g/L),
    - Cg = vapor concentration (g/L), and
    - H = Henry's Constant (dimensionless),
    - the mass of PCE in one volume of groundwater contained within the 1000 ppm contour and 100 ppm contour, respectively, assuming three feet of the total aquifer thickness came into equilibrium with the vapor, based on the concentrations of PCE in monitoring well 40D, and
    - the mass of PCE transferred to the aquifer per year, using a groundwater velocity of 60 feet per year.

Based on the above information, it was calculated that between 1954 and 1992, approximately 0.64 pounds per year of PCE discharged into the groundwater from vapors remaining in the soil resulting from releases from the former PCE Degreasing Unit. This number compared favorably with previous data indicating that approximately 25 pounds of PCE are contained in the main groundwater plume (EMCON, Groundwater Assessment for VOCs, 1991, Rev. 1.1). Assuming the release of PCE started during the operation of the unit in 1954 and 1992, the following relationship can be written:

38 years (1954-1992) x 0.64 pounds per year = 24 pounds.

The 24 pounds is only an approximation and assumes that all of the contamination has been transferred via the gaseous phase. The purpose of this exercise was to show that the former PCE Degreasing Unit was the primary source of PCE contamination to the aquifer, was in 1993, still contributing a significant amount of PCE to the system, and if not removed, the VOC plume would not diminish in size or concentration in the future.

5.5.1.1 Former PCE Degreasing Unit Investigation Steps

There were four primary steps undertaken to define the contaminant distribution and perform the remediation at the former PCE Degreasing Unit. All four steps were initiated in 1993. The first three steps were performed in 1993. The fourth step is ongoing. The SVE system, although accomplishing its design objectives, has reached a point of asymptotic recovery, and can be shut down.

Step 1. Removal of the surface concrete and approximately three feet of fill sand above the second layer of concrete.

Step 2. Use soil gas, soil sampling, and material sampling to identify the location and the contents of the sump and the condition of soils adjacent to and below it.

Step 3. Removal of the second layer of concrete over the sump and any contaminated materials present in the sump.

Step 4. Remediation of the former PCE Degreasing Unit.

5.5.1.1.1 Step 1, Concrete and Fill Sand Removal

Bon L removed the surface concrete slab (4 to 6 inches thick) over the eastern portion of the former PCE Degreasing Unit as shown on Figure 16. The volume of concrete removed was approximately 40 cubic yards. It was determined in the Stage 1 Investigation that approximately 3 feet of clean fill sand was present below the concrete floor. Bon L removed this sand (approximately 84 cubic yards) to allow access to the second layer of concrete covering the former degreasing sump. The surficial concrete and fill sand was sampled and analyzed for PCE and TCE using EPA Method 8260 to verify that it was not contaminated prior to disposal.

A work area extending 20-30 feet from the northwest and southeast sides of the excavation was kept clear to allow safe movement of heavy equipment and allow for temporary storage of clean fill sand and non-contaminated concrete in a container.

5.5.1.1.2 Step 2, Soil Gas Survey and Soil Sampling

Following the removal of the concrete floor and fill sand (Step 1), EMCON personnel used the same soil gas method utilized in the Stage I Investigation to probe and sample through the second layer of concrete. EMCON then determined the location of the sump and the VOC content of the materials contained within.

The soil gas survey was conducted by first drilling through the six-inch thick concrete flooring using a one-inch diameter carbide tipped drill bit attached to an electric roto-hammer. Then, 5/8-inch diameter, low carbon steel hollow rods were driven into the soil using the electric roto-hammer. The bottom section of the rod was attached via a hollow nipple to a six-inch slotted steel screen (0.020 slot width), through which the vapors were drawn.

A vacuum was applied at the surface by using an electric oil-free compressor equipped with a water trap and capable of 1.3 cubic feet per minute (CFM) volume at nominal vacuum and a maximum vacuum of 23 inches of mercury. Concentration readings in parts per million (ppm) on the photoionization detector (PID) were measured at a “T” on the exhaust side of the vacuum pump.

The maximum and the stable vapor concentrations were recorded for each sample depth and location. These concentrations were measured on a PID calibrated to a 100 part per million (ppm) toluene gas standard and equipped with a 10.6 electron volt lamp. The soil gas rods and the vacuum pump were purged with ambient air between each soil gas probe location until a reading of background (0 ppm) was observed on the PID. The vacuum gauge reading during purging was also recorded.

The number of soil samples collected was based on the observed soil gas concentration data. Soil sampling was accomplished using a two-inch diameter stainless steel hand auger after coring the six-inch thick concrete at each location. Soil sample collection, cleaning of sampling equipment, sample preservation methods, and chain-of-custody procedures was performed in accordance with Appendix IC-F of the Part B Permit Application.

5.5.1.1.3 Step 3, Excavation and Materials Sampling

Following the delineation described in Section 5.5.1.1.2, the second layer of concrete over the sump and as much contaminated material from the sump as was practical and feasible was removed. PCE and TCE are both ideal compounds for identification with a PID due to their high volatility and low ionization potential. Therefore, the extent of materials removed was determined using a PID.

VOC contaminated materials excavated from the former PCE Degreasing Unit were placed into a lined container and covered with 5-mil plastic. The contaminated materials were disposed of at an approved hazardous waste disposal facility.

5.5.1.2 Remediation of the Former PCE Degreasing Unit

5.5.1.2.1 Available Soil Treatment Options

Technologies available for remediating the contaminated soil zone include:

1. excavation and off-site disposal,
2. biodegradation (in-situ or treatment module),
3. chemical degradation (combined with pump and treat),
4. in-situ soil washing,
5. excavation, ex-situ on-site treatment, and off-site disposal, and
6. in-situ air stripping (vapor extraction).

While several of these technologies may provide the desired cleanup level, their inherent limitations or their economic feasibility usually limit their applicability at a site. The following subsections analyze each alternative.

5.5.1.2.1.1 Excavation and Off-site Disposal

In this alternative, soils would have been excavated, loaded onto trucks, and transported to a disposal facility. This was a traditional method for remediation of soils in the early 90s. Excavation is a very effective method in treating soils above the water table, but there is a limit to the depth of excavation below the water table. In addition, it takes up valuable landfill space. Soils that are removed must be replaced with clean fill and compacted according to the structural support needs of the area.

5.5.1.2.1.2 Biodegradation

Although it has been advertised as the treatment technology of the future, only limited full-scale application of biodegradation had taken place in 1993. It reportedly had considerably lower initial capital costs than excavation, but there continue to be limitations to its feasibility. Successful use of biodegradation requires a thorough understanding of the on-site hydrology, microbiology, and chemical characteristics. There are three classifications of biodegradation technology:

1. aerobic, in which oxygen is needed as a terminal electron acceptor,
2. anaerobic, in which sulfates or nitrates are needed as the terminal electron receptor, and
3. fermentation, in which terminal electron acceptors are discharged as reduced organics.

Prior to 1993, relevant literature contained reports that aerobic biodegradation had been successfully used to degrade gasoline, non-halogenated hydrocarbons, and aromatics. Other reports state that halogenated aliphatics, such as PCE and TCE, are not significantly degraded by aerobic biodegradation, but are degraded anaerobically. In 1993, anaerobic degradation of halogenated aliphatics had been conducted only under limited conditions without extensive, full-scale application.

5.5.1.2.1.3 Chemical Degradation

In this process, oxidizing or reducing agents are injected into the contamination zone to degrade the contaminant into other chemicals. This oxidation-reduction reaction degrades the chemical to a by-product that has more favorable characteristics, which may include lower toxicity, increased mobility, volatility, or adsorption properties. In 1993 the most common chemical degradation process was the injection of ozone into the soil matrix. Ozone is capable of oxidizing many compounds, including halogenated hydrocarbons, halogenated aromatics, and pesticides.

The chemical reactivity of a contaminant, as well as the mobility of the contaminant with the soil during application of the oxidizing/reducing agent, determines the chemical’s ultimate fate. The complex physical/chemical interaction at a site complicates the remedial design and frequently is reason to eliminate this technology as an alternative. In addition, unfavorable by-products are often the results of chemical degradation, and they may have decreased volatility or adsorption characteristics, making them more difficult to remove following chemical degradation.

5.5.1.2.4 Soil Washing

This technique solubilizes a substance in water to transfer it from the soil matrix into the groundwater. Typically, an underground piping network or above-ground bermed area or pit is constructed to fit the dimensions of the contaminated area. Water flow is maintained through the soil and the groundwater is pumped to the surface through recovery wells and treated.
Organics having high solubilities (including alcohols, phenols, and other organics with an octal-water coefficient <10) are very easily flushed from the soil. Organics that have medium solubility (including low molecular weight ketones, aldehydes, and aromatics, and low molecular weight halogenated organics) may also be effectively removed. The VOCs on-site have low solubilities.

Water is commonly used as the flushing solution; however, acids, bases, chelating agents, and surfactants also are used to enhance the flushing rate of a chemical from the soil matrix.

Soil washing can be described as an accelerated precipitation and percolation process that can effectively remove VOCs. If a soil washing system is designed properly, the overall length of time for groundwater recovery and treatment can be reduced significantly. A major consideration is the capacity of the groundwater recovery system. The groundwater recovery system must be capable of recovering all the contaminants flushed from the soil. In addition, the treatment system must be designed to handle the added contaminant loading.

5.5.1.2.1.5 Air Stripping

An innovative technology that has been given significant recent attention is in-situ soil treatment of VOCs through air stripping. The technology also is referred to as soil venting and enhanced volatilization. In-situ air stripping relies on the characteristics that cause a contaminant to volatize into the air available in the void spaces within the subsurface soil matrix.

The treatment system consists of one or more withdrawal wells constructed similar to groundwater withdrawal wells, except that the screened interval is located within the unsaturated soil zone. The well is connected to a blower's intake. The blower develops a vacuum or pressure drop across the soil matrix, thus inducing an air flow through the soil. The VOCs are driven into the air phase because of their higher vapor pressure. Equilibrium drives the VOCs from the liquid phase, adsorbed to the soil particles, into the gas phase.

As air moves from outside the contaminated zone through the contaminated zone, air is enriched with VOCs prior to leaving the soil matrix through the withdrawal well and discharge pipe. This technology will work for any volatile compounds in virtually any soil conditions. Operation of the system depends largely on the number of withdrawal wells needed to remediate the area, the time available to achieve cleanup, and the vapor treatment process costs. The VOCs on-site have high vapor pressures.

5.5.1.2.1.6 Excavation and On-site Treatment

The above techniques may be combined to increase overall treatment effectiveness (e.g., when a site's hydrogeology, geochemistry, or other characteristics are less than ideal for any one technology). A common combination is mechanical excavation and biodegradation, soil washing, or above-ground (ex situ) air stripping. The mechanical manipulation involved in removing the soil from the site may change its physical characteristics, which may make for more effective application of one of the other treatment technologies. For example, the use of in-situ air stripping becomes quite feasible in sand and porous soils; increased volatility of contaminants also enhances air stripping. Drawbacks of this method include handling and exposure to high concentrations and residual soils and vapors not removed continuing to affect groundwater.

5.5.1.2.1.7 Excavation and Mechanical Screening

Soil excavation combined with mechanical disking is another such alternative. The mechanical disking device increases the void volume of the soils and thus increases the rate of volatilization of the contaminants from the soil. Similarly, soils may be excavated and placed in a bioreactor. Soil conditions also can be adjusted to obtain maximum biological growth and biodegradation.

Combining technologies does have drawbacks; one must purchase the equipment and labor for both technologies. Quite frequently, combinations may be feasible only for treatment of large volumes.

5.5.1.2.2 Evaluating Remediation Alternatives

In this section, the above-described remediation alternatives will be evaluated based on the following criteria:

- ability to satisfy requirements of 40 CFR §264.100,
- technical feasibility,
- economic feasibility,
- short-term effectiveness, and
- long-term effectiveness.

5.5.1.2.2.1 No Action Alternative

No remedial action would be implemented under this alternative. In this alternative, public health risks from potential exposure to contaminated soils would not exist because the six-inch thick concrete floor caps the soil. However, this source would still contribute to the existing groundwater plume. This alternative would severely hinder the groundwater clean-up effort because the primary PCE/TCE source at the site would still exist.
This scenario would be the simplest option to implement and the least expensive in capital costs. However, the long-term costs in regard to the effect on the clean up of the underlying aquifer would be significant, making this the least desirable alternative discussed in this plan. Implementation of this alternative would provide no overall protection of human health and the environment.

5.5.1.2.2.2 Excavation and Off-site Disposal

This option would involve removing the existing concrete floor and excavating the contaminated soils underlying the unit. The materials would be incinerated as F-001 waste and properly disposed. The excavation would then be backfilled and compacted, and a new cement floor would then be poured. Excavating the soils would be effective in protecting human health and the environment from potential exposures. The majority of contaminated soils would be removed from the ground, although some low levels of PCE/TCE would likely still exist at the fringes of the excavation. This technique would no effectively remove contaminants within the unexcavated underlying saturated zone. Therefore, an in-situ vapor extraction system would still be needed to remediate the area. During excavation activities, workers could be exposed to contaminated materials. Use of required protective equipment during the remediation would minimize any risks.

This remediation method is technically feasible and has been proven successful for many years on similar projects. The excavation would pose several technical problems. It would require heavy equipment to operate inside the plant. The restricted working area in the operating plant would require arranging access for backhoes, trucks, and roll-off containers to enter and exit the facility.

This option will not be economically feasible because the volume of soils to be incinerated results in high disposal costs. Although this option is very effective in reducing PCE/TCE transport to the groundwater, additional vapor extraction will be necessary to substantially remove the contaminants from the saturated zone. In addition, this option would take up unnecessary space in the landfill.

5.5.1.2.2.3 In-Situ Biodegradation

The first step for this alternative involves removing the sump and any contaminated materials contained within it. A thorough bench scale test would be performed to evaluate the effectiveness of particular microbes to degrade PCE and TCE. Since the area of contamination is shallow, aerobic conditions exist. Although halogenated organics have been degraded to anaerobic microbes (under lab conditions), they are not significantly degraded by aerobic microbes.

Due to the inability of this technology to achieve the cleanup objectives, this is not a viable option.

5.5.1.2.2.4 Soil Washing

This remediation method would involve injecting water into the soils underlying the unit. A small pumping station situated at the unit would inject the water and also could treat the water and either dispose or recycle it back into the soils.

Due to the low solubilities of PCE and TCE, this system would be less efficient than air stripping. The heterogeneity of the soils would probably create preferential flow paths, which also would reduce the efficiency of this system at the former PCE Degreasing Unit.

The capital costs for this alternative would be comparable to in-situ vapor extraction. The O&M costs may be higher due to the inefficiency of the system and costs associated with water disposal.

5.5.1.2.2.5 In-Situ Air Stripping

This alternative includes removing the existing concrete floor and materials within the sump. All contaminated materials encountered during the excavation would be properly disposed. Several vapor extraction wells (VEWs) would be installed in and around the former PCE Degreasing Unit. A small treatment plant, which would include appropriate blowers, demisters, and adsorption units, would be constructed at the unit or outside of the plant. The system would require approximately six months to one year to meet the anticipated cleanup objectives.

The alternative would be very effective in removing PCE/TCE in the soils underlying the unit. PCE and TCE both have high vapor pressures, meaning they will readily desorb from the soils and volatize. The treatment would also be effective in removing dissolved or non-dissolved contaminants from the partially or fully saturated zones. Heterogeneities within the soils could create preferential pathways for the movement of vapor; this would reduce the efficiency of the system. Since the concrete floor will be re-established after the wells are installed, the availability of make-up air may be limited. This may necessitate the need for injection wells. Overall, this is a well-proven technology that would be applicable for this area. The total estimated construction cost for the alternative is $20,500. Additional operations and maintenance (O&M) and reporting costs are approximately $20,000. The most significant factors affecting the cost are the number of wells required and whether make-up air will be required. These additional costs should only be about 10 to 20 percent of the total construction cost.

5.5.1.2.2.6 Excavation and On-site Treatment

This alternative includes removing as much of the contaminated materials and soils as is practical and feasible. These materials would be placed in a lined container outside of the building and covered with plastic. Slotted PVC screens would be placed horizontally within the soils in a manner that would allow the entire volume to be influenced by a vapor extraction system. A small treatment plant similar to the one that would be used for an in-situ air stripping system would be installed. The system would probably require less than six months to meet the anticipated cleanup objectives.

This alternative, like the in-situ system, would be very effective in removing PCE/TCE from these soils. However, this treatment would not remove any dissolved or non-dissolved contaminants from the partially or fully saturated zones. Therefore, an in-situ vapor extraction system would still be needed to remediate the area. Thus, the costs for this alternative would be much higher than for the in-situ treatment since the excavation would have to be backfilled and the flooring re-established over a greater area.

5.5.1.2.2.7 Excavation and Mechanical Screening

The same methods used for excavation would be used for this alternative. However, prior to disposal of the soils, they would be mechanically screened and disked and then spread out in a lined area outside of the building. The volatilization rate would be quite high due to the large surface area. The treatment would continue until levels were below the LDRs. The soils could then be disposed without incineration.

Georgia EPD requires that VOCs emanating as a result of a hazardous waste cleanup be treated prior to being discharged to the atmosphere. Therefore, an elaborate vapor collection system would have to be contrasted, making this type of treatment difficult to implement. The costs for excavation would be minimal, and because VOCs would need to be treated, costs similar to the in-situ vapor extraction system would also be incurred. In addition, transportation and disposal costs for a Class C landfill would be incurred. When these three costs are considered together, this method becomes less economically feasible than in-situ vapor extraction.

5.5.1.2.3 Selected Treatment Method

Based on a combined analysis of the site conditions (Table 6), implementability (Table 7), the ability to achieve cleanup objectives, and the other considerations in Section 5.5.1.2, in-situ air stripping is the selected alternative for remediating soils at the former PCE Degreasing Unit.

5.5.1.3 Proposed Plan of Implementation

Bon L proposed implementation of a step-by-step remedial action plan (RAP) to address soil contamination in the former degreasing area. The plan also considered the economies of scale related to treating VOC-contaminated soils existing elsewhere on the Bon L site. Upon completion of the Stage II Investigation and following the removal of any contaminated materials from the sump, an in-situ vapor extraction system was used for four reasons:

1. to remediate an area of significant soil and soil vapor contamination near the upgradient end of the groundwater plume, a source area of VOCs that is affecting groundwater;
2. to implement remedial action more quickly, and with a high level of remedial benefit at a minimum cost to Bon L;
3. to reduce the workers' exposure to vapors during excavation; and
4. to provide a simple way of determining the Vapor Extraction System radius of influence and concentration versus time profile of extracted vapors, which generates data needed to calculate anticipated removal rates and to select the most economically feasible, long-term soil vapor treatment design.

5.5.1.3.1 General Design Criteria

The area around the former PCE Degreasing Unit be was demarcated to create a treatment area. This was most economically feasible and followed the removal of contaminated materials from the sump. The following steps were proposed to provide a logical and economically feasible approach. These steps are shown diagrammatically on Figure 17.

- Step 1. Perform Stage II Investigation.
- Step 2. Remove and properly dispose of any hazardous materials from the sump.
- Step 3. Install two-inch slotted (0.020-inch slot size) PVC vapor extraction wells in and around the former PCE Degreasing Unit. Vapor extraction wells should be installed using a hand auger, sand fill (20-30 mesh) in the annulus, and a cement-bentonite slurry to seal the upper casing.
- Step 4. Install a skid-mounted explosion-proof blower, demister, and four 160-pound vapor phase activated carbon drums in series (with appropriate sample ports and gauges). Wire for 230V, three-phase power. Connect via a manifold with ball valves to each vapor extraction well and conduct an extended vapor extraction test (VET) as the remediation begins.
- Step 5. Determine the vapor extraction treatment system radius and analyze the concentration versus time data. Calculate removal rate and carbon loading rate in pounds per hour and gallons per day.
- Step 6. Prepare a summary interim report describing the vapor extraction system efficiency and estimated program (schedule) of operation based on the factors previously discussed.

5.5.2 Source Control for Chromium

The former CrOH sand drying beds were closed in 1990. Approximately 1,230 tons of chromium-contaminated soil and debris were removed and disposed of at the Chemical Waste Management, Inc. facility in Emelle, Alabama. Although the unit could not be clean closed, the majority of this source was effectively removed. This was evidenced by groundwater sampling in monitoring wells 2SR and 2DR. Chromium levels since 1993 have decreased to below detection limits in monitoring wells 2SR and 2DR

5.5.3 Source Control for SWMUs 7 and 46 VOCs

The virgin solvent tank and the spent solvent tank in the former Tank Farm Unit (SWMUs 7 and 46) were decommissioned in 1996. Approximately 5,000 gallons of spent solvents were removed and disposed of at Fisher Industrial Service, 402 Webster Chapel Road, Glencoe, AL (ALD 981020894). The unit could not be clean closed. However, a potential source of new contamination from stored liquids was eliminated by tank removal.

Since clean closure was not possible, the Tank Farm Unit was closed and maintained as a landfill. The secondary containment unit for SWMU 46, the virgin solvent storage tank was converted into a concrete cap for the SWMU. The concrete cap will minimize rainfall infiltration through the solvent contamination in the area. In 1997, Bon L initiated recovery of free-phase liquids found in test wells installed as part of a remediation pilot test. Remediation of the unit, currently underway, consists of manual removal of free product, and in-situ bioremediation.

5.5.3.1 Available Soil Treatment Options

Technologies available for remediation the contaminated soil zone at the Tank Farm Unit are the same as those available for treatment of the PCE/TCE source. The primary differences at the Tank Farm Unit are that the unit is outside of the plant, and that excavation and ex-situ treatment of the soil were at least initially, a possibility. Soil removal and treatment were not considered in this case, because the area was crucial to plant operations in that it supports a roadway allowing access to much of the facility operations. Soil excavation would create a major slope stabilization challenge.

The contaminants of concern at the Tank Farm Unit are toluene, xylene, naphthalene, trimethylbenzene, and other non-halogenated solvents. Because of the volatility of these compounds, Bon L initially considered a soil vapor extraction system as the most feasible soil remediation alternative. A CAP describing a soil vapor extraction system was submitted to EPD, and approved in June 1996. Pilot testing conducted as part of the SVE system indicated that in-situ bioremediation would likely be a preferred alternative for soil remediation. Recent advances in the field of in-situ bioremediation, coupled with the fact that soil vapor extraction merely transfers contaminants to another medium for disposal, caused a revision of plans. At present, a CAP describing the results of the pilot test and containing plans for a bioremediation system has been submitted to EPD under a separate cover.

5.6 GROUNDWATER CONTROL FOR CHROMIUM AND PCE/TCE PLUMES

The groundwater corrective action system proposed in 1993 includes:

1. removing contaminated groundwater with a dewatering system and pumping the water to a central location,
2. processing the water through an on-site treatment system to remove volatile organic contaminants and chromium, and
3. disposal of the treated effluent in an acceptable manner.
4. As of January 2000, the chromium plume and secondary PCE/TCE plume have been remediated and no longer exist. Therefore, the following sections only address groundwater control alternatives for the primary PCE/TCE plume.

5.6.1 Groundwater Control Alternatives for Chromium and PCE/TCE Plumes

This section describes available groundwater recovery, groundwater treatment, and wastewater disposal options. First, Section 5.6.1.1 discusses and evaluates groundwater recovery options.

Second, Section 5.6.1.2 discusses and evaluates groundwater treatment options and is separated into discussions about VOC treatment options and chromium treatment options. Finally, Section 5.6.1.3 discussed and evaluates available wastewater disposal options.

5.6.1.1 Groundwater Recovery Options

Two basic methods were considered for aquifer dewatering: 1) subsurface drains, and 2) the use of remedial pumping wells.

5.6.1.1.1 Subsurface Drains

Drains are commonly used on sites where subsurface permeability is relatively low because pumping wells cannot extract water at a significant rate without lowering the water table to unacceptable levels. As an alternative, drains can dewater a large area without exceeding the available drawdown. The main limitation of drains is that their installation using a conventional backhoe is limited to about 12 to 16 feet. At the Bon L site, the depth to groundwater contamination is generally too great for the application of drains.

5.6.1.1.2 Remedial Pumping Wells

The ability of remedial wells to extract the contaminated groundwater at the Bon L site or the "yield" has been investigated in detail. The yield of individual wells will vary, as evidenced by yields observed while bailing existing on-site monitoring wells. Some existing monitoring wells yield almost no water, while others yield up to three or four gallons per minute (gpm). This variability is due primarily to localized low permeability zones. In addition to these factors, long-term pumping yields will also be affected by the thickness of the saturated zone. The greater the thickness of the saturated layer of saprolite, the higher the yield that can be expected at that location. Yields from new pumping wells constructed with five- or six-inch diameter screens, and located within relatively thickly saturated areas, are expected to range from 1 to 7 gpm. Selected existing monitoring wells (deep wells) can be used in some instances, although their yields will be in the low end of this range.

In developing a withdrawal system for the Bon L site, a range of well-pumping scenarios have been investigated using capture zones calculated using the MODFLOW model. First, the number of wells necessary to remove the contamination was estimated. Remedial well numbers and locations were adjusted in a series of model runs intended to optimize capture zones. During this process, the potential for using existing test wells as pumping wells was also evaluated.

Model runs were used to optimize the specific well layout to provide an adequate capture zone. Drawdowns displayed the effects of constant head boundaries across the Bon L site. When a discharge well was placed too close to a stream (e.g., just north of monitoring well 43S), very little influence was predicted by the Model. When wells were placed further from constant head boundaries, they tended to have greater drawdown radii. Wells located in areas where groundwater naturally converges, such as near monitoring wells 33D, 29S, and West Washington Street Branch, had significant capture zones even when drawdowns were not very high. However, discharge wells placed where groundwater diverges, such as near monitoring well 2SR, did not have significant capture zones. An exception is near 7D where a significant drawdown is necessary to capture groundwater. Based upon the model simulations, seven recovery wells discharging between 1 to 7 gpm each will reduce the further spread of contamination and will provide a sound basis for groundwater remediation.

The specific objectives of the groundwater remediation system are to:

1. place recovery wells slightly downgradient of the areas showing the highest concentrations of contaminants,
2. contain the plume and prevent or reduce migration,
3. place wells within the chromium plumes near monitoring wells 4S and 2SR. (These former chromium plumes no longer exist.)

To accomplish the first objective, RW-1 was placed downgradient from the former PCE Degreasing Unit and RW-4 was placed downgradient from the high VOC concentrations near monitoring wells 29S and 35D.

To accomplish the second objective, RW-5 and RW-6 were placed perpendicular to groundwater flow near the end of the on-site VOC plume. The placement of RW-2 and RW-5 (existing well DW-2) meets the third objective.

In late 1997, Bon L installed 6 additional recovery wells, designated RW-8 through RW-13. The locations of these wells were based on observations of the existing VOC plume, and were selected to intercept VOCs migrating in groundwater. The new recovery wells were brought online in March 1998.

The recovery well layout ultimately selected for this CAP includes existing test well DW-2, new pumping wells, and the continued use of the spring and low point collector now in operation. The recovery well layout is presented in more detail in Section 5.6.2.1.

5.6.1.2 Groundwater Treatment Options

Several treatment options were considered for treating volatile organics and chromium at the site. For treating VOCs, three technologies were considered: air stripping (tower), diffused air stripping, and carbon adsorption. The contaminants of concern are the permit VOCs. All of these technologies are considered to be effective and reliable for this application.
Two treatment options were considered for treating chromium at the site. These options include carbon adsorption and chemical treatment. Both of these technologies are effective and reliable for this application. Carbon adsorption coupled with pre-treatment to remove suspended solids by means of a settling tank and filters was ultimately selected based on the cost of initial startup, annual operating costs, and ease of operation. Target effluent concentrations for NPDES permit metals and permit organics are the groundwater protection standards for each parameter.

Any of these systems will require pre-treatment to remove suspended solids by means of a settling tank and filters.

5.6.1.2.1 Treatment of VOCs

5.6.1.2.1.1 Air Stripping

The air stripping process uses an intense air flux to volatilize dissolved VOCs from the groundwater. A "packed" tower with countercurrent flow of air and water is the most efficient method of air stripping. Contaminated water is introduced into the top of the tower, which is a cylinder typically one to four feet in diameter and about 12 to 20 feet high. The water then flows over an internal packing material as air is blown into the base of the tower and flows upward, contacting the water. This causes a high level of turbulence and a very large surface area for mass transfer. Volatile organics are transferred from the water to the air and carried out the top of the column.

One criterion that defines the effectiveness of this method for particular contaminants is Henry's Law. It states that the partial pressure of gas or volatile compound in the air above an aqueous solution is directly proportional to its concentration in the solution at equilibrium. As a rule of thumb, compounds having a Henry's Constant above ten atmospheres (atm.) are good candidates for air stripping. For comparison, the compound of interest having the highest Henry's Constant is PCE (11000 atm.) and the lowest is benzene (240 atm.).

Currently the EPD Hazardous Waste Management Branch prohibits the use of air strippers (without air treatment) because contaminated air is discharged to the atmosphere.

5.6.1.2.1.2 Diffused Air Stripping

This process is accomplished by injecting air into an aeration tank through a bubble diffuser. Mass transfer is accomplished when the contaminants are transferred to the air at the water-air interface of the air bubbles. This method is not as efficient as a packed tower because the contact time with air is less. Recent studies have shown that the process is very dependent on the diffuser used, because smaller air bubbles in higher concentrations are more efficient than larger, less numerous air bubbles.

Currently the EPD Hazardous Waste Management Branch prohibits the use of air stripping (without air treatment) because contaminated air is discharged to the atmosphere.

5.6.1.2.1.3 Carbon Adsorption

The carbon adsorption process involves passing water through activated carbon filters. In the adsorption process, carbon contains an extensive maze of macro- and micro-scale pores, onto which molecules physically bond to the carbon. Carbon is very effective in treating PCE and

TCE and low concentrations of heavy metals. The carbon adsorption is a closed process that is irreversible expect at high energy levels. Carbon can be regenerated through steam or thermal reactivation, although its adsorption capacity is not restored to 100 percent.

Water is treated until the internal pores of the carbon become saturated with contaminant molecules. As saturation increases, the effluent becomes increasingly contaminated. At "breakthrough," removal efficiencies decline and untreated VOCs would remain in the effluent. As a result, periodic sampling of the effluent is required to ascertain when the carbon needs to be replaced.

5.6.1.2.2 Treatment of Chromium
5.6.1.2.2.1 Carbon Adsorption

The carbon adsorption process for chromium (metals) is similar to the VOC adsorption mechanism. Carbon is known to be effective for treating hexavalent chromium and is believed to be similarly effective for treating trivalent chromium. In a hypothetical example, to treat a 30 gpm flow stream with contaminant concentrations of 80 ppb chromium, 200 ppb PCE, 20 ppb TCE, 10 ppb toluene, and 5 ppb total xylenes, an ethylbenzene manufacturer suggests two sets of two in-series canisters with a contact time of 10 minutes to reduce the chromium concentration to below detection limits. This information was obtained from a manufacturer of carbon adsorption units (American Norit Corporation). Based on chromium analyses performed during the aquifer test at DW-2, much lower influent levels of chromium are expected. The 80 ppb level was chosen to show the effectiveness of this treatment method.

5.6.1.2.2.2 Chemical Treatment

The chemical treatment method requires the construction of an integrated wastewater system including chemical feed, mixing, equalization tanks, pH adjustment tank, flocculation tank, clarifier, and final pH adjustment prior to discharge. The wastewater treatment system treats chromium bearing wastewaters by adding lime or caustic to adjust pH for metal hydroxide precipitation. The existing F019 wastewater treatment system at Bon L could potentially serve this purpose. However, the low concentrations of chromium in the groundwater at Bon L would not warrant such an option.

5.6.1.3 Wastewater Disposal Options

Three options were considered for the disposal of treated wastewater effluent: 1) discharge to the City of Newnan sewerage system, 2) discharge into the existing permitted outfall to Mineral Springs Branch, and 3) discharge into a newly permitted outfall and into the existing permitted outfall.

Discharge to the city sewer would require an industrial pretreatment discharge permit under the Clean Water Act. According to the EPD, Newnan does not have an approved industrial pretreatment program as required by the Act, so Bon L would need a permit from the EPD as well as approval from the City.

Bon L already discharges treated wastewater into Mineral Springs Branch under NPDES Permit No. GA0000507, which became effective on January 23, 1990 (Appendix D). The proposed effluent from this corrective action would not exceed any of the NPDES permit limits or conditions or result in a violation of Georgia's water quality standards. Therefore, Bon L proposes to notify EPD of a modification to its wastewater and to discharge effluent from the correction action treatment unit or units into the permitted outfall prior to the sampling and metering station.

An additional discharge point may be permitted to allow for an additional treatment plant to minimize the amount of water transfer around the site. This would reduce the number of pumping stations and simplify the control system. However, because two effluent streams would exist, more sampling would be required.

5.6.2 Selected Groundwater Control for Chromium and PCE/TCE Plumes

This section describes the selected groundwater recovery, groundwater treatment, and wastewater disposal options. Section 5.6.2.1 describes the proposed groundwater collection layout and the anticipated capture zones. Section 5.6.2.2 describes the selected groundwater treatment system the anticipated influent parameters, and the methods for flow equalization and sediment removal. Section 5.6.2.3 describes the proposed wastewater disposal system and the necessary permit modifications for this system.

5.6.2.1 Selected Groundwater Control Recovery System

The components of the proposed groundwater withdrawal system, consisting of seven remedial wells, the on-site spring, and the low point collector, are shown in Figure 18. In 1993 and 1994, Bon L installed seven recovery wells. Bon L installed six additional recovery wells in 1997 and 1998. Figure 19 diagrams well construction. Recovery wells were constructed using six-inch PVC pipe, with screens beginning five to ten feet below the water table and extending to the bottom of the saturated interval of the shallow aquifer. The recovery wells were drilled to the base of the saprolite aquifer with a 10.25-inch outer borehole. The gravel pack was tremied into the recovery well annulus to provide good contact with the subsurface. The recovery wells were equipped with one-half horsepower submersible pumps. One test well installed in 1993 was converted into a pumping well by outfitting the well with the same type of pumps that will be utilized in the new wells.

Remedial wells RW-5 and RW-6 are intended to intercept and prevent further contamination from migrating beyond the facility boundary. Wells RW-1 and RW-4 are located in areas of contamination downgradient of the areas exhibiting the highest concentration of VOCs along the axis of the main plume. The spring and low point collector are expected to intercept contamination in the Hillside Area and, eventually, the PCE underlying the main facility building to the northeast. RW-7 has been positioned downgradient of the property boundary to reduce VOC concentrations within the off-site portion of the plume. Recovery well RW-3 will recover VOCs in the small secondary plume north and west of the polishing pond. RW-8, RW-9, and RW-10 were installed to intercept a portion of the plume immediately upgradient of their location. RW-11 and RW-12 were installed to intercept any portion of the plume moving toward the drainway downgradient of their location. RW-13 was installed south of West Washington Road.

Figure 20 shows the steady-state water levels and capture zones expected, in 1993, after continued pumping in the shallow aquifer. The flow lines on Figure 20 represented the area captured by the pumping system. Groundwater inside the capture zone is removed by the remediation system and treated. In 1996, a similar analysis of the actual water level patterns observed by using the existing monitoring wells, and additional piezometers as needed, was performed. Based on the 1996 analysis, Bon L installed additional recovery wells in 1997 and 1998 to achieve the capture zones stated in this plan.

5.6.2.2 Selected Groundwater Treatment System

Schematic flow diagrams for the groundwater collection system are shown on Figure 21.

5.6.2.2.1 Anticipated Influent Parameters

Table 8 shows the expected flow rate and the concentration of contaminants for each of the recovery wells. This table shows present concentrations that are expected to decrease quickly after the recovery system is in operation. Estimated flow rates were based on actual flow rate data and hydrogeologic conductivity data. The actual flow rate may be less, but should not be more than this amount. Therefore, these influent parameters are conservative for preliminary design purposes. During the design phase of the project, single-well pumping tests on completed recovery wells will be used to verify flow rates and size the necessary piping and pumps for the system.

Based on these data, the expected total influent flow rate is about 45 gpm, and the VOC concentration is approximately 195 µg/1 (total for all compounds). This is shown in Table 8. Concentrations of all permit metals are expected to be minimal. This is based on chromium levels being BDL during aquifer testing at test well DW-2, which is located within the chromium plume at the CrOH landfill. The estimated amount of F001 and F019 waste treated per year based on the anticipated influent concentrations is approximately 18 pounds and 0.4 pounds, respectively.

5.6.2.2 Flow Equalization and Sediment Removal

Most of the recovery wells produce low flow rates. The effluent flows into one equalization tank (see Figure 18). A continuously operated pump and force main transport the influent directly into another equalization tank that is part of the water treatment system. Because of proper recovery well construction and development, suspended solids are not a major problem. The flow equalization tank provides adequate solids (sediment) removal prior to pumping to the treatment unit. The tank has sufficient capacity for a minimum residence time of eight hours based on the actual flow rate. The tank is a circular clarifier with an overflow weir discharging to a wet well for the pump. This provides excellent solids removal prior to entering the treatment system. The tank is manually cleaned of sediment as necessary, and the sediments disposed of as hazardous wastes. Recovery wells are temporarily shut off once or twice a year for a day when cleaning is required.

5.6.2.2.3 Activated Carbon Adsorption

Carbon adsorption units are installed as shown in Figure 21. These units are extremely effective in removing low concentrations of organic and inorganic (metal) contaminants. The minimum design contact time is ten minutes. The expected life of the primary carbon adsorption unit based on 160 pounds of carbon at 20 percent efficiency and the influent flow rate and concentrations listed in Table 8 is approximately 8 years. This is very conservative because the influent concentrations typically decrease substantially during the years of extraction. Upstream filters remove any solids.

5.7 CORRECTIVE ACTION MONITORING PLAN

A corrective action monitoring program will gauge the effectiveness of the corrective action. The monitoring shall also be used to ensure that effluents from the treatment systems are within acceptable limits.

5.7.1 Monitoring for Vapor Extraction System

Monitoring of the VOCs in the vapor extraction treatment system included sampling the influent and effluent air on a monthly basis. In addition, a port between the two carbon units was sampled to determine whether breakthrough had occurred. All measurements were made using a photoionization detector (PID) calibrated to a PCE gas standard. In addition, flow rates at the treatment plant were recorded and combined with the PID readings to determine mass removal rates and total mass removed from the soil.

The vapor extracted from each well was tested with a PID at startup and on a monthly basis. This data was used to maintain the optimum air flow configuration. In January 2000, this system is operating eight hours per day, one day per week. Upon approval of the current permit modification request, the system will be shut down, since the remediation goal was achieved.

5.7.2 Monitoring for Pump and Treat

5.7.2.1 Treatment System Influent/Effluent Monitoring

Monitoring of permit metals and VOCs in the treatment system, including the influent and the effluent, are performed to accurately gauge the total amounts of VOCs and metals treated and to ensure that the effluent is below the Part B Permit's Groundwater Protection Standards.

Extracted water from each recovery well installed in 1993 and 1994 was sampled at the beginning of the program and annually thereafter. Recovery well RW-2, which is located within the former chromium plume but not one of the VOC plumes, was analyzed for permit metals; and recovery well RW-6, located in both the former chromium plume and the VOC plumes, was and will be analyzed for permit VOCs and permit metals. Recovery wells installed in 1997 are tested for permit VOCs and, for permit metals. Long-term testing will be based on the results of these samples.

5.7.2.2 System Operations Monitoring

Operational monitoring requirements for the groundwater pumping system include such things as pump flow rate, pressure, and temperature. Additionally, system parameters such as fluid level in the equalization tanks, total volume of effluent, physical condition of the recovery wells, and status of carbon breakthrough are a few examples. Disposable items, such as filters, will be checked regularly and replaced as necessary to optimize system efficiency.

Water level in the recovery wells, percentage of operational downtime, and other parameters monitored will also be recorded on a weekly basis. The field data form is included as Figure 22.

5.7.3 Groundwater Monitoring

5.7.3.1 Corrective Action Monitoring

As per Section III.D.3.c of the Part B permit, groundwater samples will be collected semi-annually from selected wells within and adjacent to all plumes of contamination and analyzed. Previous semi-annual sampling has shown that the VOC plume is well contained within the natural hydrogeologic boundaries. Samples will be collected from the following monitoring wells:
Analyzed for Permit VOCs

> 2DR, 7D, 13S, 20D, 21D, 24D, 27S, 32S, 36D, 39D, 40D, OS-1S, OS-3D, OS-5D, OS-8D, BR-1, BR-3, and BR-6

5.7.3.2 Compliance Point Monitoring

As of July 1997, corrective action monitoring was being done at one hazardous waste management unit, the CrOH landfill, and one hazardous waste management area, the CrOH sand drying beds and surface impoundment unit. Monitoring wells 2SR, 48S, 49S, and 50S comprise the point of compliance for the CrOH sand drying beds and the surface impoundment unit.

Monitoring wells 4SR, 17D, 17S, and 19S comprise the point of compliance for the CrOH landfill. From 1992 through December 1997, samples from these wells were collected quarterly and analyzed for the permit metals and permit VOCs. Beginning in 1998, samples from these wells were and will be collected semi-annually and analyzed for the permit metals and permit VOCs. Monitoring wells 51S and 52S comprise the point of compliance for the former tank farm unit. Beginning in December 1997, samples from 51S and 52S were collected quarterly for the first year and are currently being monitored semi-annually for permit VOCs, permit metals, and naphthalene. Monitoring well 13S will serve as the background well and will be sampled each time other wells are sampled. Samples from 13S will be analyzed for the same parameters as the other wells.

5.8 TERMINATION CRITERIA

5.8.1Termination Criteria for the SWMU-49 Vapor Extraction System

A target soil clean-up level of less than 50 ppb (as determined using EPA Method 8260) was used to determine whether to request permission to shut down the system. The 50 ppb termination criteria was used for several reasons:

- because this is the current LDR for PCE which is based on its ability to leach using the TCLP test,
- because the area is capped with concrete inside a building, the leaching potential is low due to the lack of rainwater infiltration, and
- because at 50 ppb, the contribution to soil vapors and groundwater is negligible.

In 1998, Bon L pursued testing under shutdown criteria for the vapor extraction system. These criteria are described in "PCE DEGREASER CORRECTIVE ACTION PLAN AND VAPOR EXTRACTION SYSTEM DESIGN REPORT" prepared by EMCON in 1994. A copy of this report is attached as Appendix F. Criteria include testing of unfiltered off gasses at prescribed time intervals, and soil sampling. Procedures, analytical results, and recommendations are included in "FINAL CLOSURE PROCEDURES FORMER PCE/TCE DEGREASING UNIT" prepared by Thomas W. Watson, Inc. in 1998. A copy of this report is attached as Appendix G. In February 2004, at the request of Georgia EPD, Bon L conducted further testing of the system off gasses. A description of the sampling protocol and analytical results are included as Appendix H. All sampling conducted between 1998 and present indicate that the SVE system has reached a point of asymptotic recovery. Therefore, we believe it has accomplished its design objective. For this reason, Bon L will shut down the SVE system upon reissuance of the permit.

5.8.2 Termination Criteria for the Groundwater Extraction System

The primary objective of the recovery system is to remediate the groundwater until the Part B Permit Groundwater Protection Standards for the VOCs are met. To meet this standard, groundwater recovery will continue at each pumping well until the groundwater protection standards are no longer exceeded. When each pump is turned off, the well will be resampled after three months to ensure that these levels are not exceeded in the pumped wells. After this confirmation sampling event, the pumping well will be taken off the recovery system. Groundwater remediation using the well field recovery system will be considered complete after all recovery wells, compliance point wells, and monitoring wells within the contaminant plumes meet the Groundwater Protection Standards. If the recovery well concentrations approach an asymptotic level, Bon L will petition for a technical impracticability waiver. Reaching an asymptotic level will indicate that no benefit is being gained from further pump and treat methods, which may be cause by aquifer heterogeneities, contaminant absorption, or other related factors.

5.9 Projection of Remediation Time Frames

5.9.1 Projection of Remediation Time Frames for the Vapor Extraction System

The goal of the vapor extraction system is to remove the bulk of the contaminants in the soils underlying the former PCE Degreasing Unit. The monthly concentration and mass removal rate data will be plotted against time to give a concentration trend. This trend will be extrapolated to the point equal to the 10 ppm vapor concentration (termination point). This will provide an estimate of the total remediation time for this system. However, Bon L's request for final shutdown of the system was based on confirmatory soil and soil gas sampling.

5.9.2 Projection of Remediation Time Frames for the Groundwater Extraction System

One of the goals in 1994, the first year of operation, was to provide a preliminary projection of the cleanup trends at the site. Two methods of analysis that lend themselves to the evaluation of remediation time trends include time trend evaluation of water quality data at specific wells and a more hypothetical evaluation of the rate of removal of chemical contaminants from the aquifer. The second method results in projections based on mass loading reductions compared to source loads.

During the first year of remediation, contaminant concentrations within each recovery well will be plotted against time to give a concentration trend. This method, while useful, is often not representative of long-term concentrations within each well due to the exponential decrease in contaminant concentrations versus time.

An alternative method for projecting remediation time is to estimate cleanup based on the removal of the mass quantities of contaminants present in the aquifer. This evaluation depends on calculating the mass of contaminant present in the aquifer and the kinetics regarding source areas.

An optimistic estimate of the time needed to achieve the cleanup goals can be made by knowing the total mass of PCE in the groundwater and an average mass removal rate. This analysis assumes the following:

1. source areas don't contribute to the mass of PCE in the groundwater,
2. 25 pounds of PCE are contained in the groundwater at the site (EMCON, Groundwater Assessment for VOCs, 1991),
3. extraction rates (disregarding the Hillside Area) will average 26 gpm,
4. the average concentration of the recovery well PCE effluent is the concentration calculated in Table 8 (40 µg/1), and
5. the retardation coefficient for PCE at the site is approximately 3.

Based on these 1993 assumptions, it will require approximately 16 years to remediate the groundwater for PCE. However, because the efficiency of the recovery system is likely to diminish following initial plume capture and the removal of the highest concentration areas, the projected time frame for remediation is longer.

5.10 REPORTING REQUIREMENTS

In addition to the reporting requirements specified in the Part B Permit, Bon L will submit semi-annually to the EPD a report describing the status of the Corrective Action Program. These reports will enable the state to assess the effectiveness of the program and provide their input on any necessary modifications. The semi-annual report will include:

- estimates of the plume direction and rate of movement,
- laboratory analytical reports,
- annual data regarding the amount of water treated from the recovery well system,
- effluent concentrations of VOCs,
- plume boundary map(s),
- mass of PCE/TCE vapor extracted,
- time trend graphs,
- groundwater elevations for each well in the sampling event,
- potentiometric map, defining recovery well capture zones and groundwater flow directions,
- isopleth maps, and
- groundwater recovery system inspection reports.

5.11 SCHEDULE FOR IMPLEMENTATION

The Corrective Action Plan was initiated in 1994 and modified in 1997. There are currently no plans to modify the existing system.

5.12 FINANCIAL ASSURANCE

Bon L will use the "corporate guarantee" as the method for demonstrating financial responsibility for corrective action associated with groundwater remediation of the chromium and VOC plumes. This includes costs for engineering design, equipment, installation of remedial system, operations and maintenance, and monitoring.

This Corrective Action cost estimate will be kept on file by Bon L. The cost estimate will be adjusted for inflation annually within 30 days after the close of Bon L's fiscal year in accordance with Georgia Rule 391-3-11-.10 (40 CFR §264.144 (b)). Whenever a change in the Corrective Action Plan affects the cost of corrective action, the cost estimate will be adjusted within 30 days after the revision to the Corrective Action Plan in accordance with Georgia Rule 391-3-11-.10 (40 CFR §264.144 (c)).

TABLE 1: OFF-SITE WATER SUPPLY WELLS SURVEY INFORMATION

WELL NO.	OWNER	LATTITUDE	LONGITUDE	DEPTH (FT)	CASING DEPTH (FT)	YEAR DRILLED	ELEVATION (FT)
1	McDowell Brothers Pinehill Estates Newnan	33 21' 52"	84 54' 10"	247	78	1974	800
2	McDowell Brothers Pinehill Estates Newnan	33 21' 47"	84 54' 19"	217	65	1975	820
3	J.W. Hughie 11 Beech St. Newnan	33 23' 19"	84 49' 41"	320	70	1977	890
4	Fred L. Schronder 16 Beech St. Newnan	33 23' 17"	89 49' 45"	255	65	1974	940
5	Garnett H. Shirley 132 Temple Ave. Newnan	33 23' 17"	84 49' 46"	230	71	1972	920
6	Dixie Hill Enterprises McDowell Brothers Wedgewood Subdivision Newnan	33 23' 16"	84 49' 58"	unknown	unknown	1977	960
7	Dixie Hill Enterprises McDowell Brothers Wedgewood Subdivision Newnan	33 23' 17"	84 50' 10"	187	31	1977	840
8	Westside School Newnan	33 22' 27"	84 49' 48"	302	113	1954	860
9	Roy E. Knox Belt Rd. Newnan	33 22' 12"	84 49' 37"	136	19	1958	880
10	Bon L Manufacturing Newnan	33 23' 43"	84 48' 02"	350	83.5	1958	960
11	BPOE Club (Elks) Atlanta Hwy. (Hwy. 29) Newnan	33 23' 51"	84 47' 49"	265	72	1959	920
12	J.B. Peniston 128 Woodbine Cir. Newnan	33 21' 43"	84 48' 12"	450	98	1957	950
13	Sam Willoughby West Washington St. Newnan	unknown	unknown	17	not cased	1905	unknown

TABLE 2: PCE AND TCE CONCENTRATIONS IN STREAMS AND PRIVATE WELLS

SAMPLE NO.	SAMPLE LOCATION	SAMPLE DATE	PCE (µg/l)	TCE (µg/l)	REPORT NUMBER	NOTES
A1	Mineral Springs Branch	5/2/1990	BDL	BDL	21016-3	20' upstream from South prop. line
A2	W. Washington Creek	5/2/1990	5	BDL	21016-4	20' prior to confluence w/ Min. Springs Branch
A3	Mineral Springs Branch	5/2/1990	BDL	BDL	21016-5	Just after confluence w/ W. Wash. Creek
A4	W. Washington Creek	7/26/1990	4	BDL	22517-1	20' before confl. with Min. Springs Branch
A5	W. Washington Creek	7/26/1990	5	BDL	22517-4	Upstream from culvert
1	Mineral Springs Branch	7/5/1990	BDL	BDL	22088-1	After confluence w/ W. Washington Creek
2	Mineral Springs Branch	7/5/1990	3	BDL	22088-3	Just after confluence w/ W. Washington Creek
3	W. Washington Creek	7/5/1990	5	BDL	22088-5	Prior to confluence w/ Mineral Springs Branch

TABLE 2: PCE AND TCE CONCENTRATIONS IN STREAMS AND PRIVATE WELLS

SAMPLE NO.	SAMPLE LOCATION	SAMPLE DATE	PCE (µg/l)	TCE (µg/l)	REPORT NUMBER	NOTES
4	W. Washington Creek	7/5/1990	6	BDL	22088-7	50' east of sample (Report No. 22088-5)
5	W. Washington Creek	7/5/1990	7	BDL	22088-9	50' east of sample (Report No. 22088-7)
6	W. Washington Creek	7/5/1990	4	BDL	22088-11	About 450' east of sample (Report No. 22088-9)
7	Mineral Springs Branch	7/5/1990	BDL	BDL	22088-13	Just south of W. Washington Street
8	Mineral Springs Branch	7/5/1990	BDL	BDL	22088-15	Prior to confluence w/ drainage ditch
9	Mineral Springs Branch	7/5/1990	BDL	BDL	22088-17	Prior to confluence w/ Mineral Springs Branch
10	Drainage Ditch	7/5/1990	7	BDL	22088-19	150' east of sample (Report NO. 22088-17)
11	Drainage Ditch	7/5/1990	44	BDL	22088-21	By southern end of polishing pond

TABLE 2: PCE AND TCE CONCENTRATIONS IN STREAMS AND PRIVATE WELLS

SAMPLE NO.	SAMPLE LOCATION	SAMPLE DATE	PCE (µg/l)	TCE (µg/l)	REPORT NUMBER	NOTES
12	Drainage Ditch	7/5/1990	71	3	22088-23	Towards middle of polishing pond
13	Drainage Ditch	7/5/1990	89	3	22088-25	Towards north end of polishing pond
14	Drainage Ditch	7/5/1990	143	BDL	22088-27	Drainage from above settling pond
15	Drainage Ditch	7/5/1990	77	3	22088-29	Just south of beginning of drainage ditch
16	Drainage Ditch	7/5/1990	157	BDL	22088-31	Beginning of drainage ditch
	Hendrix Private Well	6/28/1990	BDL	BDL	22038-1	
	Willoughby Private Well	6/28/1990	BDL	BDL	22038-2	
	Know Private Well	6/29/1990	BDL	BDL	22038-3	

TABLE 2: PCE AND TCE CONCENTRATIONS IN STREAMS AND PRIVATE WELLS

SAMPLE NO.	SAMPLE LOCATION	SAMPLE DATE	PCE (µg/l)	TCE (µg/l)	REPORT NUMBER	NOTES
17	Drainage Ditch	10/21/1992	BDL	BDL	Mobile Lab 5	Towards north end of polishing pond
18	Maintenance Yard Ditch	10/21/1992	BDL	BDL	Mobile Lab 5	On northwest side of main building
19	Drainage Ditch	10/21/1992	BDL	BDL	Mobile Lab 5	At south end of polishing pond
20	Maintenance Yard Ditch	10/21/1992	BDL	BDL	Mobile Lab 5	On northwest side of main building
21	West Washington Creek	10/21/1992	5	2	Mobile Lab 5	Near OS1D
22	Drainage Ditch	10/21/1992	15	4.5	Mobile Lab 5	North end of settling pond
1 - 7/29/03	Mineral Springs Branch	7/29/2003	BDL	BDL	179586-1	Near OS1D
2 - 7/29/03	Mineral Springs Branch	7/29/2003	BDL	BDL	179586-2	Approximately midway between OS1D and OS3D

TABLE 2: PCE AND TCE CONCENTRATIONS IN STREAMS AND PRIVATE WELLS

SAMPLE NO.	SAMPLE LOCATION	SAMPLE DATE	PCE (µg/l)	TCE (µg/l)	REPORT NUMBER	NOTES
3 - 7/29/03	Mineral Springs Branch	7/29/2003	BDL	BDL	179586-3	Near OS3D
1 - 8/5/03	Drainage Ditch	8/5/2003	40	BDL	179922-1	Near 27S and 27D
2 - 8/5/03	Drainage Ditch	8/5/2003	11	BDL	179922-2	Near RW4
3 -8/5/ 03	Drainage Ditch	8/5/2003	BDL	BDL	179922-3	Near Rw5
4 - 8/5/03	West Washington Creek	8/5/2003	2	BDL	179922-4	West of RW13
5 - 8/5/03	West Washington Creek	8/5/2003	2	BDL	179922-5	Near confluence of West Washington Street Creek and Mineral Springs Branch

TABLE 3: SUMMARY OF STEP TESTING DATA

TEST WELL	DATE TESTED	AVERAGE PUMPING RATES (gpm)				
		STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
DW1	4/5/1989	0.25	0.5	0.85		
DW2	12/12/1992	1	2	5	7.5	8

TEST WELL	AQUIFER PARAMETERS (PRELIMINARY ESTIMATE)		
	TRANSMISSIVITY (ft^2/day)	HYDRAULIC CONDUCTIVITY (ft/day)	PUMPING RATE RANGE (pgm)
DW1	9.1 - 9.4	0.30 - 3.3	0.3 - .85
DW2	660 - 963	33 - 48	1.0 - 8.5

TABLE 4: SUMMARY OF CONSTANT RATE PUMP TESTING RESULTS

PUMPING WELL PW1					
OBSERVATION WELL	**DISTANCE FROM PUMPING WELL (ft)**	**MAXIMUM DRAWDOWN (ft)**	**TRANSMISSIVITY (ft^2/day)**	**CONDUCTIVITY (ft/day)**	**STORATIVITY (DIMENSIONLESS)**
PZ4	12.5	1	27.36	1.15	8.5×10^{-4}
MW-2S	18	0.32	44.64	2.25	3.6×10^{-3}

PUMPING WELL DW2					
OBSERVATION WELL	**DISTANCE FROM PUMPING WELL (ft)**	**MAXIMUM DRAWDOWN (ft)**	**TRANSMISSIVITY (ft^2/day)**	**CONDUCTIVITY (ft/day)**	**STORATIVITY (DIMENSIONLESS)**
T5	10	0.68	744	35.45	2.1×10^{-2}
T6	10	1.31	586	27.36	1.6×10^{-2}

TABLE 5: SUMMARY OF HYDRAULIC CONDUCTIVITY DATA

WELL NO.	TEST METHOD	HYDRAULIC CONDUCTIVITY	
		ft/min	ft/day
1S	Steady State Flow Test[1]	7.5×10^{-4}	1.1
1D	Steady State Flow Test[1]	9.0×10^{-3}	1.3
3S	Steady State Flow Test[1]	2.3×10^{-5}	3.3×10^{-2}
4S	Steady State Flow Test[1]	1.5×10^{-3}	2.15
5S	Steady State Flow Test[1]	3.2×10^{-5}	0.046
6S	Steady State Flow Test[1]	1.1×10^{-3}	2.07
7S	Steady State Flow Test[1]	2.0×10^{-3}	2.89
7S	Slug Test[2]	1.37×10^{-2}	19.77
7D	Steady State Flow Test[1]	2.3×10^{-4}	0.33
7D	Slug Test[2]	7.6×10^{-4}	1.09
8S	Steady State Flow Test[1]	2.0×10^{-4}	0.28
8D	Steady State Flow Test[1]	5.7×10^{-4}	0.82
9S	Steady State Flow Test[1]	9.9×10^{-4}	1.43
9S	Slug Test[3]	3.4×10^{-3}	4.9
9D	Steady State Flow Test[1]	7.3×10^{-4}	1.05
9D	Slug Test[3]	3.4×10^{-5}	0.05
11S	Steady State Flow Test[1]	4.4×10^{-4}	0.63
12D	Slug Test[3]	5.0×10^{-4}	0.72
12S	Slug Test[3]	3.0×10^{-3}	4.32
13S	Steady State Flow Test[1]	3.3×10^{-3}	4.73
13S	Slug Test[3]	1.8×10^{-3}	2.59
14S	Steady State Flow Test[1]	9.8×10^{-4}	1.42
15S	Steady State Flow Test[1]	3.2×10^{-4}	0.46
15S	Slug Test[3]	5.3×10^{-3}	7.63
15D	Steady State Flow Test[1]	6.2×10^{-4}	0.89
15D	Slug Test[3]	2.0×10^{-4}	0.29
16S	Steady State Flow Test[1]	2.7×10^{3}	3.86
16D	Steady State Flow Test[1]	3.4×10^{-5}	0.048
17S	Steady State Flow Test[1]	1.4×10^{-2}	19.84
17D	Steady State Flow Test[1]	1.4×10^{-4}	0.2
26D	Slug Test[2]	1.7×10^{-3}	2.48

TABLE 5: SUMMARY OF HYDRAULIC CONDUCTIVITY DATA

WELL NO.	TEST METHOD	HYDRAULIC CONDUCTIVITY	
		ft/min	ft/day
26S	Slug Test[2]	5.8×10^{-5}	0.08
27S	Steady State Flow Test[1]	1.2×10^{-3}	1.69
27D	Steady State Flow Test[1]	1.5×10^{-3}	2.18
27D	Slug Test[3]	7.5×10^{-4}	1.08
32D	Slug Test[2]	8.9×10^{-5}	0.13
40D	Slug Test[2]	3.9×10^{-3}	5.65
41D	Slug Test[2]	1.6×10^{-3}	2.35
43S	Steady State Flow Test[1]	1.3×10^{-3}	1.85
44D	Steady State Flow Test[1]	1.4×10^{-3}	2
44S	Steady State Flow Test[1]	3.8×10^{-4}	0.54
OS3S	Slug Test[2]	5.9×10^{-4}	0.85
OS3D	Slug Test[2]	8.1×10^{-4}	1.17
2SR	Slug Test[2]	1.7×10^{-3}	2.52
2DR	Slug Test[2]	4.6×10^{-4}	0.66
DW1	Slug Test[2]	1.7×10^{-4}	0.25
DW2	Slug Test[2]	9.3×10^{-3}	13.43
DW2-T5	Aquifer Test[5]	2.5×10^{-2}	35.45
DW2-T6	Aquifer Test[5]	1.9×10^{-2}	27.36
PW1-PZ4	Aquifer Test[4]	9.4×10^{-4}	1.15
PW1-MW2S	Aquifer Test[4]	1.5×10^{-3}	2.25

Notes:

1. Pseudo-Steady State Drawdown, Assessment of Potential Sources of release of Volatile Organic Compounds, SES, 1991.
2. 2.Slug Tests performed by EMCON Southeast, 1992 (Appendix B)
3. 3.Slug Tests, Part B Permit Application, 1992
4. 4.Aquifer Test, ATEC, 1991 (Appendix B)
5. 5.Aquifer Test, EMCON Southeast, 1992 (Appendix B

TABLE 6: APPLICABILITY OF IN-SITU OR EX-SITU AIR STRIPPING

CHARACTERISTIC*	TREATMENT REQUIREMENT	BON L FACILITY
Type of materials spilled	Volatile at room temperature	VOCs (high vapor pressure)
Concentration in soil	g.t. 1 ppm	g.t. 0.1 - 1375 ppm
Volume of contaminated soil	g.t. 200 yd^3	300 yd^3 or more
Depth to groundwater	g.t. 15 ft	15 - 16 ft
Permeability of soil	> 1 x 10^{-8} cms	2.5 x 10^{-2}
Stratification of soil	Minimal	Homogenous fill and saprolite
Structural restraints	Can be implemented in areas close to buildings	Area of contamination in building

TABLE 7: IMPLEMENTATION PROBABILITY OF TREATMENT ALTERNATIVES

TREATMENT ALTERNATIVE	IMPLEMENTATION PROBABILITY	REASONS
Excavation and disposal	Moderate	Effective removal of contaminants. Volume of soil to be incinerated yields high disposal cost. In-situ vapor extraction would still be necessary
In-situ soil washing	Moderate	Possibly effective for removal May be restricted by facility limitations
In-situ biodegradation	Low	Halogenated organics not readily biodegradable with existing site-proven methods
In-situ chemical degradation	Low	Chlorinated hydrocarbons may produce unfavorable by-products Incomplete treatment potential
In-situ or ex-situ air stripping	High	Effective in past installation with similar hydrogeology and contaminant characteristics
Excavation and mechanical screening	Low	Low potential effectiveness High cost

TABLE 8: EXPECTED CONTAMINANT CONCENTRATIONS WITHIN REMEDIAL WELL EFFLUENT

REMEDIAL WELL EFFLUENT CONCENTRATION					
WELL NO.	**PCE (ug/l)**	**TCE (ug/l)**	**TOLUENE (ug/L)**	**OTHERS (ug/L)**	**FLOW RATE (gpm)**
RW-1	60	20			1.5
RW-2	0	0		20	0.9
RW-3	10	0			4
RW-4	130	70			1.8
RW-5	20	10			7
RW-6	70	10		10	7
RW-7	25	5			4
Spring	450	10			10.6
L. P. C.	70	5	280	70	3.7

GROUNDWATER TREATMENT PLANT INLET CONCENTRATION				
PCE (ug/l)	**TCE (ug/l)**	**TOLUENE (ug/L)**	**OTHERS (ug/L)**	**FLOW RATE (gpm)**
150 ug/L	13 ug/L	26 ug/L	9 ug/L	40.5 gpm

NOTES:

Others includes ethylbenzene, total xylenes at the L.P.C., and chromium at RW-2 and RW-6.

L.P.C. - Low Point Collector

Spring and L.P.C. are part of interim corrective measures.

Flow rates are estimates.

APPENDIX A

Laboratory Reports
(Data Collected Since June 1992)

APPENDIX A

Semi-Annual Corrective Action Monitoring Data

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Report No. 35645-1

Attention: Mr. Terry Snell

Sample: Groundwater, OS6D, 6/15/92, 1230hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	5.01	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	1820	1
Temperature (°C)(EPA 170.1)(on site)	20	-
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Deier

cc: Mr. Dave Buchalter

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-2

Sample: Groundwater, OS8D, 6/15/92, 1100hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.40	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	30	1
Temperature (°C)(EPA 170.1)(on site)	21	-
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Beir

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-3

Sample: Groundwater, OS4D, 6/15/92, 1150hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	6.19	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	160	1
Temperature (°C)(EPA 170.1)(on site).........	20	-
Tetrachloroethene (ug/l)(EPA 8260)...........	31	2
Trichloroethene (ug/l)(EPA 8260).............	3	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dier

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-4

Sample: Groundwater, OS5D, 6/15/92, 1400hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)......................	6.84	-
Specific Conductance (umhos/cm) (EPA 9050)(on site).....................	70	1
Temperature (°C)(EPA 170.1)(on site).........	18	-
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: *Denise A. Dier*

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-5

Sample: Groundwater, Hillside Spring, 6/15/92, 1430hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	4.60	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	280	1
Temperature (°C)(EPA 170.1)(on site)..........	24	-
Tetrachloroethene (ug/l)(EPA 8260)............	440	2
Trichloroethene (ug/l)(EPA 8260)..............	7	2
Ethylbenzene (ug/l)(EPA 8260).................	BDL	2
Toluene (ug/l)(EPA 8260)......................	BDL	2
Xylenes (ug/l)(EPA 8260)......................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Blair

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-6

Sample: Groundwater, Low Point Collector, 6/15/92, 1435hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	5.92	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	390	1
Temperature (°C)(EPA 170.1)(on site)	25	-
Tetrachloroethene (ug/l)(EPA 8260)	11	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	21	2
Xylenes (ug/l)(EPA 8260)	24	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dien

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Report No. 35645-7

Attention: Mr. Terry Snell

Sample: Groundwater, OS7D, 6/15/92, 1615hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.01	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	70	1
Temperature (°C)(EPA 170.1)(on site)	19	-
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Oliver

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Report No. 35645-8

Attention: Mr. Terry Snell

Sample: Groundwater, 19D, 6/15/92, 1715hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	6.32	-
Specific Conductance (umhos/cm) (EPA 9050)(on site).....................	600	1
Temperature (°C)(EPA 170.1)(on site).........	19	-
Tetrachloroethene (ug/l)(EPA 8260)...........	70	2
Trichloroethene (ug/l)(EPA 8260).............	28	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dier

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-9

Sample: Groundwater, 9D, 6/16/92, 0830hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	6.31	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	110	1
Temperature (°C)(EPA 170.1)(on site).........	19	-
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: *[signature]*

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ANALYTICAL SERVICES, INC.

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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-10

Sample: Groundwater, 9S, 6/16/92, 0815hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	5.49	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	20	1
Temperature (°C)(EPA 170.1)(on site)	18	-
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dix[signature]

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-11

Sample: Groundwater, 21D, 6/16/92, 0930hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.56	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	30	1
Temperature (°C)(EPA 170.1)(on site)	18	-
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Elder

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-12

Sample: Groundwater, 21S, 6/16/92, 0915hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.20	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	140	1
Temperature (°C)(EPA 170.1)(on site)	19	-
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Oliver

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-13

Sample: Groundwater, 24D, 6/16/92, 1100hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	5.36	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	30	1
Temperature (°C)(EPA 170.1)(on site).........	20	-
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Oien

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-14

Sample: Groundwater, 37D, 6/16/92, 1215hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	5.78	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	150	1
Temperature (°C)(EPA 170.1)(on site)	19	-
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: *Denise S. Dier*

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-15

Sample: Groundwater, 36D, 6/16/92, 1415hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	5.86	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	80	1
Temperature (°C)(EPA 170.1)(on site)..........	19	-
Tetrachloroethene (ug/l)(EPA 8260)............	BDL	2
Trichloroethene (ug/l)(EPA 8260)..............	BDL	2
Ethylbenzene (ug/l)(EPA 8260).................	BDL	2
Toluene (ug/l)(EPA 8260)......................	BDL	2
Xylenes (ug/l)(EPA 8260)......................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Eier

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-16

Sample: Groundwater, 3S, 6/16/92, 1545hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	7.19	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	860	1
Temperature (°C)(EPA 170.1)(on site)	23	-
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise L. Dier

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FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-17

Sample: Groundwater, 27D, 6/16/92, 1515hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	4.74	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	150	1
Temperature (°C)(EPA 170.1)(on site)..........	22	-
Tetrachloroethene (ug/l)(EPA 8260)...........	98	2
Trichloroethene (ug/l)(EPA 8260).............	3	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Deier

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Report No. 35645-18

Attention: Mr. Terry Snell

Sample: Groundwater, 2DR, 6/16/92, 1530hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	6.14	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	3960	1
Temperature (°C)(EPA 170.1)(on site).........	23	-
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dier

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Report No. 35645-19

Attention: Mr. Terry Snell

Sample: Groundwater, 15D, 6/17/92, 0845hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	5.78	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	610	1
Temperature (°C)(EPA 170.1)(on site)..........	20	-
Tetrachloroethene (ug/l)(EPA 8260)............	2	2
Trichloroethene (ug/l)(EPA 8260)..............	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Toluene (ug/l)(EPA 8260)......................	BDL	2
Xylenes (ug/l)(EPA 8260)......................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dean

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Report No. 35645-20

Attention: Mr. Terry Snell

Sample: Groundwater, 7D, 6/17/92, 0940hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	5.78	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	1020	1
Temperature (°C)(EPA 170.1)(on site)	20	-
Tetrachloroethene (ug/l)(EPA 8260)	19	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Geier

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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-21

Sample: Groundwater, 31D, 6/17/92, 1015hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	6.38	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	540	1
Temperature (°C)(EPA 170.1)(on site)..........	19	-
Tetrachloroethene (ug/l)(EPA 8260)............	170	2
Trichloroethene (ug/l)(EPA 8260).............	120	2
Ethylbenzene (ug/l)(EPA 8260).................	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dier

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-22

Sample: Groundwater, 6D, 6/17/92, 1115hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	5.01	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	1820	1
Temperature (°C)(EPA 170.1)(on site)	20	-
Tetrachloroethene (ug/l)(EPA 8260)	3	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise A. Oliver

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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Report No. 35645-23

Attention: Mr. Terry Snell

Sample: Groundwater, 46S, 6/17/92, 1100hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.55	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	1880	1
Temperature (°C)(EPA 170.1)(on site)	20	-
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dier

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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Report No. 35645-24

Attention: Mr. Terry Snell

Sample: Groundwater, 29D, 6/17/92, 1145hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	5.44	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	490	1
Temperature (°C)(EPA 170.1)(on site)	19	-
Tetrachloroethene (ug/l)(EPA 8260)	380	2
Trichloroethene (ug/l)(EPA 8260)	22	2
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise A. Dien

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-25

Sample: Groundwater, 40D, 6/17/92, 1430hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	4.16	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	230	1
Temperature (°C)(EPA 170.1)(on site)	21	-
Tetrachloroethene (ug/l)(EPA 8260)	380	2
Trichloroethene (ug/l)(EPA 8260)	34	2
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Oliver

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-26

Sample: Groundwater, 39D, 6/17/92, 1520hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	5.33	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)....................	130	1
Temperature (°C)(EPA 170.1)(on site).........	20	-
Tetrachloroethene (ug/l)(EPA 8260)...........	4	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise A. [signature]

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-27

Sample: Groundwater, 12D, 6/17/92, 1620hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	4.36	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	1880	1
Temperature (°C)(EPA 170.1)(on site)	20	-
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dien

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-28

Sample: Groundwater, 47S, 6/17/92, 1600hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.12	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	1310	1
Temperature (°C)(EPA 170.1)(on site)	21	-
Tetrachloroethene (ug/l)(EPA 8260)	290	2
Trichloroethene (ug/l)(EPA 8260)	61	2
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Oiler

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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-29

Sample: Groundwater, 42S, 6/18/92, 1030hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	7.02	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	1480	1
Temperature (°C)(EPA 170.1)(on site)	20	-
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Oliver

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Report No. 35645-30

Attention: Mr. Terry Snell

Sample: Groundwater, 43S, 6/18/92, 1100hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.23	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	1470	1
Temperature (°C)(EPA 170.1)(on site)	19	-
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dier

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Report No. 35645-31

Attention: Mr. Terry Snell

Sample: Groundwater, 44S, 6/18/92, 1130hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	5.63	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	570	1
Temperature (°C)(EPA 170.1)(on site)	20	-
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: [signature]

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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Report No. 35645-32

Attention: Mr. Terry Snell

Sample: Groundwater, 44D, 6/18/92, 1135hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	5.84	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	480	1
Temperature (°C)(EPA 170.1)(on site)..........	20	-
Tetrachloroethene (ug/l)(EPA 8260)............	BDL	2
Trichloroethene (ug/l)(EPA 8260)..............	BDL	2
Ethylbenzene (ug/l)(EPA 8260).................	BDL	2
Toluene (ug/l)(EPA 8260)......................	BDL	2
Xylenes (ug/l)(EPA 8260)......................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise A. Ocier

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

July 16, 1992

P.O. No. 1.2026.05

Attention: Mr. Terry Snell

Report No. 35645-33

Sample: Groundwater, 45S, 6/18/92, 1200hrs, received 6/18/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.63	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	1200	1
Temperature (°C)(EPA 170.1)(on site)	19	-
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise A. [signature]

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Report No. 40051-1

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Semi-annual Corrective Action Groundwater Monitoring/ HW-087, 24D, 1/11/93, 1450hrs, received 1/12/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	5.45	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	35.9	1
Temperature (°C)(on site)(EPA 170.1)	9.8	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dixon

cc: Mr. Dave Buchalter (EMCON SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Report No. 40051-2

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Semi-annual Corrective Action Groundwater Monitoring/ HW-087, 26D, 1/11/93, 1200hrs, received 1/12/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	4.97	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)......................	483.0	1
Temperature (°C)(on site)(EPA 170.1)..........	8.4	-
Ethylbenzene (ug/l)(EPA 8260).................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)............	45	2
Toluene (ug/l)(EPA 8260)......................	BDL	2
Trichloroethene (ug/l)(EPA 8260)..............	3	2
Xylenes (ug/l)(EPA 8260)......................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: [signature]

cc: Mr. Dave Buchalter (EMCON SE)

ASI

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 40051-3

Sample: Groundwater, grab, Semi-annual Corrective Action Groundwater Monitoring/ HW-087, 36D, 1/11/93, 1045hrs, received 1/12/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.38	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	120.5	1
Temperature (°C)(on site)(EPA 170.1)	7.7	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise L. Deier

cc: Mr. Dave Buchalter (EMCON SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 40051-4

Sample: Groundwater, grab, Semi-annual Corrective Action Groundwater Monitoring/ HW-087, 39D, 1/11/93, 1330hrs, received 1/12/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	5.41	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	166.8	1
Temperature (°C)(on site)(EPA 170.1)	8.2	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	3	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: *Denise S. Beier*

cc: Mr. Dave Buchalter (EMCON SE)

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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 40051-5

Sample: Groundwater, grab, Semi-annual Corrective Action Groundwater Monitoring/ HW-087, 40D, 1/11/93, 1115hrs, received 1/12/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	4.70	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	281.0	1
Temperature (°C)(on site)(EPA 170.1)	8.1	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	480	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	97	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dixon

cc: Mr. Dave Buchalter (EMCON SE)

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 40051-6

Sample: Groundwater, grab, Semi-annual Corrective Action Groundwater Monitoring/ HW-087, OS-7D, 1/11/93, 1415hrs, received 1/12/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	5.57	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	128.9	1
Temperature (°C)(on site)(EPA 170.1)	9.0	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: [signature]

cc: Mr. Dave Buchalter (EMCON SE)

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

February 3, 1993

P.O. No. 13371-OP

Report No. 40052-1

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Semi-annual Corrective Action Groundwater Monitoring/ HW-087, 9D, 1/12/93, 1400hrs, received 1/12/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.57	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	159.6	1
Temperature (°C)(on site)(EPA 170.1)	14.8	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: [signature]

cc: Mr. Dave Buchalter (EMCON SE)

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

February 3, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 40052-2

Sample: Groundwater, grab, Semi-annual Corrective Action Groundwater Monitoring/ HW-087, 9S, 1/12/93, 1335hrs, received 1/12/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	5.94	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)......................	23.4	1
Temperature (°C)(on site)(EPA 170.1).........	12.6	-
Ethylbenzene (ug/l)(EPA 8260).................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260)......................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260)......................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Blier

cc: Mr. Dave Buchalter (EMCON SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

February 3, 1993

P.O. No. 13371-OP

Report No. 40052-3

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Semi-annual Corrective Action Groundwater Monitoring/ HW-087, 21D, 1/12/93, 1450hrs, received 1/12/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.46	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	14.37	1
Temperature (°C)(on site)(EPA 170.1)	14.6	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise L. [signature]

cc: Mr. Dave Buchalter (EMCON SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

February 3, 1993

P.O. No. 13371-OP

Report No. 40052-4

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Semi-annual Corrective Action Groundwater Monitoring/ HW-087, 21S, 1/12/93, 1440hrs, received 1/12/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.26	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	12.95	1
Temperature (°C)(on site)(EPA 170.1)	12.7	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Eller

cc: Mr. Dave Buchalter (EMCON SE)

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

February 3, 1993

P.O. No. 13371-OP

Report No. 40052-5

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Semi-annual Corrective Action Groundwater Monitoring/ HW-087, OS-2D, 1/12/93, 1025hrs, received 1/12/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	5.88	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	602.0	1
Temperature (°C)(on site)(EPA 170.1)	11.1	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	69	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	29	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Deier

cc: Mr. Dave Buchalter (EMCON SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

February 3, 1993

P.O. No. 13371-OP

Report No. 40052-6

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Semi-annual Corrective Action Groundwater Monitoring/ HW-087, OS-5D, 1/12/93, 1145hrs, received 1/12/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.44	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	49.7	1
Temperature (°C)(on site)(EPA 170.1)	11.4	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: [signature]

cc: Mr. Dave Buchalter (EMCON SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

February 3, 1993

P.O. No. 13371-OP

Report No. 40052-7

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Semi-annual Corrective Action Groundwater Monitoring/ HW-087, OS-6D, 1/12/93, 0930hrs, received 1/12/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.06	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	52.3	1
Temperature (°C)(on site)(EPA 170.1)	10.9	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: *Denise L. [signature]*

cc: Mr. Dave Buchalter (EMCON SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

February 3, 1993

P.O. No. 13371-OP

Report No. 40052-8

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Semi-annual Corrective Action Groundwater Monitoring/ HW-087, OS-8D, 1/12/93, 0945hrs, received 1/12/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	6.63	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)......................	43.1	1
Temperature (°C)(on site)(EPA 170.1)..........	11.1	-
Ethylbenzene (ug/l)(EPA 8260).................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)............	BDL	2
Toluene (ug/l)(EPA 8260)......................	BDL	2
Trichloroethene (ug/l)(EPA 8260)..............	BDL	2
Xylenes (ug/l)(EPA 8260)......................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dein

cc: Mr. Dave Buchalter (EMCON SE)

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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

February 3, 1993

P.O. No. 13371-OP

Report No. 40052-9

Attention: Mr. Terry Snell

Sample: Water, grab, Semi-annual Corrective Action Groundwater Monitoring/HW-087 Field Blank, 1/12/93, 1330hrs, received 1/12/93

RESULTS

	Result	Detection Limit
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise P. Olier

cc: Mr. Dave Buchalter (EMCON SE)

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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

February 3, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 40052-10

Sample: Water, grab, Semi-annual Corrective Action Groundwater Monitoring/HW-087 Trip Blank, 1/12/93, received 1/12/93

RESULTS

	Result	Detection Limit
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: [signature]

cc: Mr. Dave Buchalter (EMCON SE)

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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 40053

Sample: Groundwater, grab, Semi-annual Corrective Action Groundwater Monitoring/ HW-087, 19S, 1/12/93, 0830hrs, received 1/12/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	5.38	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)......................	256	1
Temperature (°C)(on site)(EPA 170.1).........	11.3	-
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: *Denise S. Beier*

cc: Mr. Dave Buchalter (EMCON SE)
3-10500

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

February 2, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 40093-1

Sample: Groundwater, grab, Semi-annual Corrective Action Groundwater Monitoring/ HW-087, 2DR, 1/13/93, 1020hrs, received 1/13/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.70	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	3870	1
Temperature (°C)(on site)(EPA 170.1)	14.0	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dein

cc: Mr. Dave Buchalter (EMCON SE)

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

February 2, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 40093-2

Sample: Groundwater, grab, Semi-annual Corrective Action Groundwater Monitoring/ HW-087, 6D, 1/13/93, 1500hrs, received 1/13/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	4.95	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)........................	1017	1
Temperature (°C)(on site)(EPA 170.1)..........	17.1	-
Ethylbenzene (ug/l)(EPA 8260).................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	2	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Oleir

cc: Mr. Dave Buchalter (EMCON SE)

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

February 2, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 40093-3

Sample: Groundwater, grab, Semi-annual Corrective Action Groundwater Monitoring/ HW-087, 12D, 1/13/93, 1135hrs, received 1/13/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	4.31	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)......................	2070	1
Temperature (°C)(on site)(EPA 170.1).........	16.2	-
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise L. Dean

cc: Mr. Dave Buchalter (EMCON SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

February 2, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 40093-4

Sample: Groundwater, grab, Semi-annual Corrective Action Groundwater Monitoring/ HW-087, 15D, 1/13/93, 1035hrs, received 1/13/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)......................	6.14	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)......................	757	1
Temperature (°C)(on site)(EPA 170.1).........	14.3	-
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise L. Deir

cc: Mr. Dave Buchalter (EMCON SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

February 2, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 40093-5

Sample: Groundwater, grab, Semi-annual Corrective Action Groundwater Monitoring/ HW-087, 29D, 1/13/93, 1120hrs, received 1/13/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	5.63	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	539	1
Temperature (°C)(on site)(EPA 170.1)	14.7	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	490	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	25	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: [signature]

cc: Mr. Dave Buchalter (EMCON SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

February 2, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 40093-6

Sample: Groundwater, grab, Semi-annual Corrective Action Groundwater Monitoring/ HW-087, 31D, 1/13/93, 1535hrs, received 1/13/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.16	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	1790	1
Temperature (°C)(on site)(EPA 170.1)	16.8	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	180	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	120	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: *Denise S. Davis*

cc: Mr. Dave Buchalter (EMCON SE)

ASI ANALYTICAL SERVICES, INC.
ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE • ATLANTA, GEORGIA 30309 • (404) 892-8144
FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER:

PROJECT NAME: GW MONITORING FOR VOCs

CLIENT NAME: WILLIAM L. BONNELL

CLIENT ADDRESS AND PHONE NUMBER: 25 BONNELL St NEWNAN, GA. 30264

PROJECT MANAGER: TERRY SNELL

COPY TO:

REQUESTED COMP. DATE: NORMAL

SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☐ OTHER ____

FOR LAB USE ONLY: LAB# 35645 | LAB # | PROJECT NO. | ACK | VERIFIED | QUOTE# | BS | NO. OF SAMP 34 | PG 1 OF 3

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	VOC	* PH, SC, TEMP								LAB ID	REMARKS
1	6/15/92	1230				056D	2	2										* ALL DONE ON SITE
2		1100				058D	2	2										
3		1150				054D	2	2										
4		1400				055D	2	2										
5		1430				HILLSIDE SPRING	2	2										
6		1435				LOW Pt. COLLECTOR	2	2										
7		1615				057D	2	2										
8	↓	1715				19D	2	2										
9	6/16/92	0830				9D	2	2										
10		0815				9S	2	2										
11		0930				21D	2	2										
12		0915				21S	2	2										
13		1100				24D	2	2										
14		1215				37D	2	2										
15	↓	1415				36D	2	2										

SAMPLED BY AND TITLE: PHILLIPS/BRADFORD — DATE/TIME: 6/15-16/92

RELINQUISHED BY: Lee Phillips — DATE/TIME: 6/18/92 1600

RECEIVED BY: — DATE/TIME:

RELINQUISHED BY: — DATE/TIME:

RECEIVED BY: — DATE/TIME:

RELINQUISHED BY: — DATE/TIME:

RECEIVED BY LAB: [signature] ASI/Lab — DATE/TIME: 6/18/92 4:00

SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____ — AIR BILL #

HAZWRAP/NEESA Y N | QC LEVEL 1 2 3 | COC ✓ | (ICE) | ANA REQ | TEMP | CUST SEAL ✓ | PH | SAMPLE COND.

REMARKS: WEATHER: OVERCAST/RAIN MID 80'S

ENTERED INTO LIMS ____ COC REVIEWD ____

ASI ANALYTICAL SERVICES, INC.
ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE • ATLANTA, GEORGIA 30309 • (404) 892-8144
FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER:
PROJECT NAME: GW MONITORING FOR VOLs
CLIENT NAME: WILLIAM L. BONNELL
CLIENT ADDRESS AND PHONE NUMBER: 25 BONNELL St NEWNAN, GA 30264
PROJECT MANAGER: TERRY SNELL
COPY TO:
REQUESTED COMP. DATE: NORMAL
SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☐ OTHER ____

FOR LAB USE ONLY
LAB# 35645
LAB #
PROJECT NO.
ACK | VERIFIED
QUOTE# | BS
NO. OF SAMP 34 | PG 2 | OF 3

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	VOC	*PH, SC, TEMP									LAB ID	REMARKS
16	6/16	1545				3S	2	2											*ALL DONE ON SITE
17	↓	1515				27D	2	2											
18	↓	1530				2DR	2	2											
19	6/17	0845				15D	2	2											
20	↓	0940				7D	2	2											
21	↓	1015				31D	2	2											
22	↓	1115				6D	2	2											
23	↓	1100				46S	2	2											
24	↓	1145				29D	2	2											
25	↓	1430				40D	2	2											
26	↓	1520				39D	2	2											
27	↓	1620				12D	2	2											
28	↓	1600				47S	2	2											
29	6/18	1030				42S	2	2											
30	↓	1100				43S	2	2											

SAMPLED BY AND TITLE: PHILLIPS/BRADFORD — DATE/TIME: 6/16-18/92
RELINQUISHED BY: Lee Phillips — DATE/TIME: 6/18/92 1600
RECEIVED BY: — DATE/TIME:
RELINQUISHED BY: — DATE/TIME:
RECEIVED BY: — DATE/TIME:
RELINQUISHED BY: — DATE/TIME:
RECEIVED BY LAB: MGerhana ASI/Lab — DATE/TIME: 6/18/92 4:00P
SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____
AIR BILL #
REMARKS: WEATER: SUNNY, CLEAR MID 80'S

HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
COC ✓ | (ICE)
ANA REQ | TEMP
CUST SEAL ✓ | PH
SAMPLE COND.
ENTERED INTO LIMS ____
COC REVIEWD ____

ASI ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE • ATLANTA, GEORGIA 30309 • (404) 892-8144
FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER:

PROJECT NAME: GW MONITORING FOR VOCs

CLIENT NAME: WILLIAM L. BONNELL

CLIENT ADDRESS AND PHONE NUMBER: 25 BONNELL St. NEWNAN, GA 30264

PROJECT MANAGER: TERRY SNELL

COPY TO:

REQUESTED COMP. DATE: NORMAL

SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☐ OTHER ____

FOR LAB USE ONLY: LAB# 35645 | LAB # | PROJECT NO. | ACK | VERIFIED | QUOTE# | BS | NO. OF SAMP 34 | PG 3 | OF 3

ANALYSES REQUESTED

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	VOC's	*PH, SC, TEMP									LAB ID	REMARKS
31	6/18	1130				44S	2	2											* ALL DONE ON SITE
32	↓	1135				44D	2	2											
33	↓	1200				45S	2	2											
34	↓					TRIP BLANK	2	2	—										

SAMPLED BY AND TITLE: PHILLIPS/BRADFORD — DATE/TIME: 6/15 18/92

RELINQUISHED BY: Lee Phillips — DATE/TIME: 6/18/92 1600

RECEIVED BY: — DATE/TIME:

RELINQUISHED BY: — DATE/TIME:

RECEIVED BY: — DATE/TIME:

RELINQUISHED BY: — DATE/TIME:

RECEIVED BY LAB: M. [signature] ASI/Lab — DATE/TIME: 6/18/92 4:00P

SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____

AIR BILL #

HAZWRAP/NEESA Y N
CC LEVEL 1 2 3
COC ✓ | (ICE)
ANA REQ | TEMP
CUST SEAL ✓ | PH
SAMPLE COND.

REMARKS: WEATHER: OVERCAST MID 80's

ENTERED INTO LIMS ____ COC REVIEWD ____

ASI **ANALYTICAL SERVICES, INC.**

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

390 TRABERT AVENUE • ATLANTA, GEORGIA 30309 • (404) 892-8144

FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: HW-087

PROJECT NAME: SEMI ANNUAL CORRECTIVE ACTION GROUNDWATER MONITORING

CLIENT NAME: THE WILLIAM L. BONNELL CO., INC.

CLIENT ADDRESS AND PHONE NUMBER: P.O. BOX 428 NEWNAN, GA 30264 (404) 254-7690

PROJECT MANAGER: TERRY D. SNELL

COPY TO: DAVE BUCHALTER EMCON-SOUTHEAST

REQUESTED COMP. DATE: 1/29/93

SAMPLING REQUIREMENTS: SDWA NPDES RCRA X OTHER ___

FOR LAB USE ONLY: LAB # 40051; LAB #; PROJECT NO.; ACK; VERIFIED; QUOTE#; BS; NO. OF SAMP 8; PG 1 OF 1

ANALYSES REQUESTED: PH (ON SITE); SPECIFIC CONDUCTANCE (ON SITE); TEMPERATURE (ON SITE); VOC

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	PH (ON SITE)	SPECIFIC CONDUCTANCE (ON SITE)	TEMPERATURE (ON SITE)	VOC	LAB ID	REMARKS
24D	1/11/93	1450		X		GROUNDWATER	3				3		
26D	↓	1200		↓			3				3		
36D		1045					3				3		
39D		1330					3				3		
40D		1115					3				3		
057D		1415					3				3		
		1530				FIELD BLANK	3				3		
	↓			↓		TRIP BLANK	3				3		

SAMPLED BY AND TITLE: FREDERICK / PHILLIPS — DATE/TIME: 1/11/93 1045

RELINQUISHED BY: PHILLIPS / FREDERICK — DATE/TIME: 1/11/93

RECEIVED BY: — DATE/TIME:

RELINQUISHED BY: — DATE/TIME:

RECEIVED BY: — DATE/TIME:

RELINQUISHED BY: — DATE/TIME:

RECEIVED BY LAB: M. Zeller ASI/LAB — DATE/TIME: 1/13/93 11:15am

SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ___

AIR BILL #

HAZWRAP/NEESA Y N

QC LEVEL 1 2 3

COC ✓ (ICE) ✓

ANA REQ

TEMP 8.4°C

CUST SEAL N/D

PH N/A

SAMPLE COND.

REMARKS: 24 Containers

ENTERED INTO LIMS ______ COC REVIEWD ______

ASI ANALYTICAL SERVICES, INC.
ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE • ATLANTA, GEORGIA 30309 • (404) 892-8144
FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: HW-087
PROJECT NAME: SEMI ANNUAL CORRECTIVE ACTION GROUNDWATER MONITORING
CLIENT NAME: THE WILLIAM L. BONNELL CO., INC.
CLIENT ADDRESS AND PHONE NUMBER: PO BOX 428 NEWNAN, GA 30264 404/254-7690
PROJECT MANAGER: TERRY D. SNELL
COPY TO: DAVE BUCHALTER EMCON-SOUTHEAST
REQUESTED COMP. DATE: 1/29/93
SAMPLING REQUIREMENTS: SDWA NPDES RCRA [X] OTHER ____

FOR LAB USE ONLY
LAB# B4005 2
LAB #
PROJECT NO.
ACK | VERIFIED
QUOTE# | BS
NO. OF SAMP 10 | PG 1 | OF 1

ANALYSES REQUESTED

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	PH (ON SITE)	SPECIFIC CONDUCTANCE (ON SITE)	TEMPERATURE (ON SITE)		VOC						LAB ID	REMARKS
9D	1/12/93	1400		X		GROUNDWATER	3					3							
9S	↓	1335		↓		↓	3					3							
21D	↓	1450		↓		↓	3					3							
21S	↓	1440		↓		↓	3					3							
OS-2D	↓	1025		↓		↓	3					3							
OS-5D	↓	1145		↓		↓	3					3							
OS-6D	↓	0930		↓		↓	3					3							
OS-8D	↓	0945		↓		↓	3					3							
		1330				FIELD BLANK	3					3							
						TRIP BLANK	3					3							

SAMPLED BY AND TITLE	DATE TIME	RELINQUISHED BY	DATE/TIME
FREDERICK/PHILLIPS	1/12/93 0930	PHILLIPS/FREDERICK	1/12/93
RECEIVED BY:	DATE TIME	RELINQUISHED BY:	DATE/TIME
RECEIVED BY	DATE TIME	RELINQUISHED BY:	DATE/TIME
RECEIVED BY LAB: [signature] ASI/LAB	DATE TIME 1/13/93 7:15am	SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____	AIR BILL #

REMARKS: 30 Containers

HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
COC ✓ (ICE) ✓
ANA REQ | TEMP 8.4°C
CUST SEAL NO | PH N/A
SAMPLE COND.

ENTERED INTO LIMS | COC REVIEWD

APPENDIX A

Detection Monitoring Data

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

December 1, 1992

P.O. No. 2494-0000P
Object Code #1.2026.105

Attention: Mr. Terry Snell

Report No. 38638-1

Sample: Groundwater, grab, Detection Monitoring (Day 1), 13S, 11/2/92, 1120hrs, received 11/2/92 (Metals sampled/received 11/3)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	3.5	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	46	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	4.87	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	109	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise L. Dixie

cc: Mr. Dave Buchalter (EMCON-SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

December 1, 1992

P.O. No. 2494-0000P
Object Code #1.2026.105

Attention: Mr. Terry Snell

Report No. 38638-2

Sample: Groundwater, grab, Detection Monitoring (Day 1), 42S, 11/2/92, 1210hrs, received 11/2/92 (Metals sampled/received 11/3)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	9.7	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	26	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	7.45	-
Specific Conductance (umhos/cm) (EPA 9050)(on site).......................	1911	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise L. Dein

cc: Mr. Dave Buchalter (EMCON-SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

December 1, 1992

P.O. No. 2494-000OP
Object Code #1.2026.105

Attention: Mr. Terry Snell

Report No. 38638-3

Sample: Groundwater, grab, Detection Monitoring (Day 1), 43S, 11/2/92, 1215hrs, received 11/2/92 (Metals sampled/received 11/3)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	5.6	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	28	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	6.40	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)....................	1925	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise A. Olier

cc: Mr. Dave Buchalter (EMCON-SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

December 1, 1992

P.O. No. 2494-0000P
Object Code #1.2026.105

Attention: Mr. Terry Snell

Report No. 38638-4

Sample: Groundwater, grab, Detection Monitoring (Day 1), 44D, 11/2/92, 1350hrs, received 11/2/92 (Metals sampled/received 11/3)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	BDL	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	BDL	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	5.95	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)....................	1128	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Beier

cc: Mr. Dave Buchalter (EMCON-SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

December 1, 1992

P.O. No. 2494-0000P
Object Code #1.2026.105

Attention: Mr. Terry Snell

Report No. 38638-5

Sample: Groundwater, grab, Detection Monitoring (Day 1), 44S, 11/2/92, 1320hrs, received 11/2/92 (Metals sampled/received 11/3)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	4.1	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	11	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	5.59	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)........................	1128	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Olin

cc: Mr. Dave Buchalter (EMCON-SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

December 1, 1992

P.O. No. 2494-0000P
Object Code #1.2026.105

Attention: Mr. Terry Snell

Report No. 38638-6

Sample: Groundwater, grab, Detection Monitoring (Day 1), 45S, 11/2/92, 1345hrs, received 11/2/92 (Metals sampled/received 11/3)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	7.2	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	16	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	6.58	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	880	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: *Denise A. Oliver*

cc: Mr. Dave Buchalter (EMCON-SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 25, 1992

P.O. No. 2494-000-OP

Attention: Mr. Terry Snell

Report No. 38668-1
Object Code #1.2026.105

Sample: Groundwater, grab, Detection Monitoring (Day 2), 13S, 11/3/92, 1130hrs, received 11/3/92 (Metals sampled/received 11/4)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	7.8	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	BDL	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	4.80	-
Specific Conductance (umhos/cm) (EPA 9050)(on site).....................	107	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Victor E. Bendeck, Jr.

cc: Mr. Dave Buchalter (EMCON-SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 25, 1992

P.O. No. 2494-000-OP

Attention: Mr. Terry Snell

Report No. 38668-2
Object Code #1.2026.105

Sample: Groundwater, grab, Detection Monitoring (Day 2), 42S, 11/3/92, 1220hrs, received 11/3/92 (Metals sampled/received 11/4)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	12.8	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	78	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	7.28	-
Specific Conductance (umhos/cm) (EPA 9050)(on site).....................	1899	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Victor E. Bendeck, Jr.

cc: Mr. Dave Buchalter (EMCON-SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 25, 1992

P.O. No. 2494-000-OP

Attention: Mr. Terry Snell

Report No. 38668-3
Object Code #1.2026.105

Sample: Groundwater, grab, Detection Monitoring (Day 2), 43S, 11/3/92, 1225hrs, received 11/3/92 (Metals sampled/received 11/4)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	9.1	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	45	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	6.36	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)....................	1943	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,
By: Victor E. Bendeck, Jr.

cc: Mr. Dave Buchalter (EMCON-SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 25, 1992

P.O. No. 2494-000-OP

Attention: Mr. Terry Snell

Report No. 38668-4
Object Code #1.2026.105

Sample: Groundwater, grab, Detection Monitoring (Day 2), 44D, 11/3/92, 1350hrs, received 11/3/92 (Metals sampled/received 11/4)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	3.8	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	BDL	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	5.65	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	621	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Victor E. Bendeck, Jr.

cc: Mr. Dave Buchalter (EMCON-SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 25, 1992

P.O. No. 2494-000-OP

Attention: Mr. Terry Snell

Report No. 38668-5
Object Code #1.2026.105

Sample: Groundwater, grab, Detection Monitoring (Day 2), 44S, 11/3/92, 1320hrs, received 11/3/92 (Metals sampled/received 11/4)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	7.2	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	12	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	5.70	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	1092	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	13	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,
By: Victor E. Bendeck, Jr.

cc: Mr. Dave Buchalter (EMCON-SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 25, 1992

P.O. No. 2494-000-OP

Attention: Mr. Terry Snell

Report No. 38668-6
Object Code #1.2026.105

Sample: Groundwater, grab, Detection Monitoring (Day 2), 45S, 11/3/92, 1345hrs, received 11/3/92 (Metals sampled/received 11/4)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	12.4	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	137	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	7.04	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)........................	1800	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,
By: Victor E. Bendeck, Jr.

cc: Mr. Dave Buchalter (EMCON-SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 24, 1992

P.O. No. 2494-000-OP
Object Code #1.2026.105

Attention: Mr. Terry Snell

Report No. 38699-1

Sample: Groundwater, grab, Detection Monitoring (Day 3), 13S, 11/4/92, 1140hrs, received 11/4/92 (Metals sampled/received 11/5)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	7.3	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	BDL	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	4.92	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	122	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dein

cc: Mr. Dave Buchalter (EMCON-SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 24, 1992

P.O. No. 2494-000-OP
Object Code #1.2026.105

Attention: Mr. Terry Snell

Report No. 38699-2

Sample: Groundwater, grab, Detection Monitoring (Day 3), 42S, 11/4/92, 1230hrs, received 11/4/92 (Metals sampled/received 11/5)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	6.0	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	13	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	7.47	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	1886	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By:

cc: Mr. Dave Buchalter (EMCON-SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 23, 1992

P.O. No. 2494-000-OP
Object Code #1.2026.105

Attention: Mr. Terry Snell

Report No. 38699-3

Sample: Groundwater, grab, Detection Monitoring (Day 3), 43S, 11/4/92, 1235hrs, received 11/4/92 (Metals sampled/received 11/5)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	6.5	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	23	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	6.36	-
Specific Conductance (umhos/cm) (EPA 9050)(on site).....................	1868	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise L. Beia

cc: Mr. Dave Buchalter (EMCON-SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 24, 1992

P.O. No. 2494-000-OP
Object Code #1.2026.105

Attention: Mr. Terry Snell

Report No. 38699-4

Sample: Groundwater, grab, Detection Monitoring (Day 3), 44D, 11/4/92, 1400hrs, received 11/4/92 (Metals sampled/received 11/5)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	1.3	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	10	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	5.81	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	590	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Oliver

cc: Mr. Dave Buchalter (EMCON-SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 24, 1992

P.O. No. 2494-000-OP
Object Code #1.2026.105

Attention: Mr. Terry Snell

Report No. 38699-5

Sample: Groundwater, grab, Detection Monitoring (Day 3), 44S, 11/4/92, 1330hrs, received 11/4/92 (Metals sampled/received 11/5)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	BDL	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	10	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	5.73	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	1052	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dier

cc: Mr. Dave Buchalter (EMCON-SE)

ASI

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 23, 1992

P.O. No. 2494-000-OP
Object Code #1.2026.105

Attention: Mr. Terry Snell

Report No. 38699-6

Sample: Groundwater, grab, Detection Monitoring (Day 3), 45S, 11/4/92, 1355hrs, received 11/4/92 (Metals sampled/received 11/5)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	8.1	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	57	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	6.74	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	1187	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise L. Oliver

cc: Mr. Dave Buchalter (EMCON-SE)

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 24, 1992

P.O. No. 2494-000-OP
Object Code #1.2026.105

Attention: Mr. Terry Snell

Report No. 38699-7

Sample: Field Blank, grab, Detection Monitoring (Day 3), 11/4/92, 1300hrs, received 11/4/92

RESULTS

	Result	Detection Limit
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. [signature]

cc: Mr. Dave Buchalter (EMCON-SE)

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A N A L Y T I C A L   S E R V I C E S ,   I N C .

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 23, 1992

P.O. No. 2494-000-OP
Object Code #1.2026.105

Attention: Mr. Terry Snell

Report No. 38699-8

Sample: Trip Blank, grab, Detection Monitoring (Day 3), 11/4/92, 1305hrs, received 11/4/92

RESULTS

	Result	Detection Limit
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10

BDL - Below Detection Limit

Respectfully submitted,

By: Denise P. Deer

cc: Mr. Dave Buchalter (EMCON-SE)
3-228000

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 25, 1992

P.O. No. 2494-000-OP
Object Code #1.2026.105

Report No. 38716-1

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Detection Monitoring (Day 4), 13S, 11/5/92, 1127hrs, received 11/5/92 (Metals sampled/received 11/6)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	1.4	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	14	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	4.93	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	58	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: [signature]

cc: Mr. Dave Buchalter (EMCON-SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 25, 1992

P.O. No. 2494-000-OP
Object Code #1.2026.105

Attention: Mr. Terry Snell

Report No. 38716-2

Sample: Groundwater, grab, Detection Monitoring (Day 4), 42S, 11/5/92, 1221hrs, received 11/5/92 (Metals sampled/received 11/6)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	9.7	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	66	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	7.41	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	974	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Elier

cc: Mr. Dave Buchalter (EMCON-SE)

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 25, 1992

P.O. No. 2494-000-OP
Object Code #1.2026.105

Attention: Mr. Terry Snell

Report No. 38716-3

Sample: Groundwater, grab, Detection Monitoring (Day 4), 43S, 11/5/92, 1226hrs, received 11/5/92 (Metals sampled/received 11/6)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	5.5	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	33	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)...............	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260)....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260)....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040)......................	6.59	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	1393	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise A. Oliver

cc: Mr. Dave Buchalter (EMCON-SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 25, 1992

P.O. No. 2494-000-OP
Object Code #1.2026.105

Attention: Mr. Terry Snell

Report No. 38716-4

Sample: Groundwater, grab, Detection Monitoring (Day 4), 44D, 11/5/92, 1347hrs, received 11/5/92 (Metals sampled/received 11/6)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	BDL	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	BDL	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	6.11	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	610	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Oliver

cc: Mr. Dave Buchalter (EMCON-SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 25, 1992

P.O. No. 2494-000-OP
Object Code #1.2026.105

Attention: Mr. Terry Snell

Report No. 38716-5

Sample: Groundwater, grab, Detection Monitoring (Day 4), 44S, 11/5/92, 1321hrs, received 11/5/92 (Metals sampled/received 11/6)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	BDL	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	12	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	5.85	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)........................	685	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: *Denise S. Dein*

cc: Mr. Dave Buchalter (EMCON-SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 25, 1992

P.O. No. 2494-000-OP
Object Code #1.2026.105

Attention: Mr. Terry Snell

Report No. 38716-6

Sample: Groundwater, grab, Detection Monitoring (Day 4), 45S, 11/5/92, 1343hrs, received 11/5/92 (Metals sampled/received 11/6)

RESULTS

	Result	Detection Limit
Total Organic Carbon (TOC)(mg/l)(EPA 9060)...	7.8	1.0
Total Organic Halogens (TOX)(ug/l)(EPA 9020).	16	10
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10
pH (on site)(EPA 9040).......................	6.99	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	1097	1
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)...............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Elia

cc: Mr. Dave Buchalter (EMCON-SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 25, 1992

P.O. No. 2494-000-OP
Object Code #1.2026.105

Attention: Mr. Terry Snell

Report No. 38716-7

Sample: Field Blank, grab, Detection Monitoring (Day 4), 11/5/92, 1300hrs, received 11/5/92

RESULTS

	Result	Detection Limit
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Olein

cc: Mr. Dave Buchalter (EMCON-SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 25, 1992

P.O. No. 2494-000-OP
Object Code #1.2026.105

Attention: Mr. Terry Snell

Report No. 38716-8

Sample: Trip Blank, grab, Detection Monitoring (Day 4), 11/5/92, 1305hrs, received 11/5/92

RESULTS

	Result	Detection Limit
1,1-Dichloroethene (ug/l)(EPA 8260)..........	BDL	2
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5
Vinyl chloride (ug/l)(EPA 8260)..............	BDL	10

BDL - Below Detection Limit

Respectfully submitted,

By: [signature]

cc: Mr. Dave Buchalter (EMCON-SE)

3-219000
X-480000
T-699000

ASI ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

390 TRABERT AVENUE • ATLANTA, GEORGIA 30309 • (404) 892-8144

FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: 2494-000 OP
PROJECT NAME: DAY 1 DETECTION MONITORING
CLIENT NAME: WILLIAM L. BONNELL
CLIENT ADDRESS AND PHONE NUMBER: 25 BONNELL St. NEWNAN, GA 30263
PROJECT MANAGER: TERRY SNELL
COPY TO: EMCON SOUTHEAST DAVE BUCHALTER
REQUESTED COMP. DATE: 11/20/92
SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☐ OTHER ____

FOR LAB USE ONLY: LAB# 38638; LAB #; PROJECT NO.; ACK; VERIFIED; QUOTE#; BS; NO. OF SAMP 8; PG 1 OF 1

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	TOC/TOX	VOC *	PH, SC ON SITE								LAB ID	REMARKS
1	11/2	1120		X		13S	5	2	3										* 1,1-DICHLOROETHYLENE,
2	↓	1210		↓		42S	5	2	3										ETHYLBENZENE, PCE,
3		1215				43S	5	2	3										TOLUENE, TCE, T. XYLENE,
4		1350				44D	5	2	3										VINYL CHLORIDE
5		1320				44S	5	2	3										
6		1345				45S	5	2	3										
7		1300				FIELD BLANK	5	~~2~~	3										* blanks to receive
8	↓	1305		↓		TRIP BLANK	5	~~2~~	3										VOAs only per WJ

SAMPLED BY AND TITLE: PHILLIPS/FREDERICK	DATE/TIME: 11/2/92	RELINQUISHED BY: Lu Phillips	DATE/TIME: 11/2/92 1700	HAZWRAP/NEESA Y N; QC LEVEL 1 2 3	
RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME	COC	ICE yes
				ANA REQ	TEMP 4°C
RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME	CUST SEAL	PH
				SAMPLE COND.	
RECEIVED BY LAB: J E Mark	DATE/TIME: 11/2 5:30	SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____	AIR BILL #		
REMARKS: ASI/lab 40 containers				ENTERED INTO LIMS ____	COC REVIEWD ____

ASI ANALYTICAL SERVICES, INC.
ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE • ATLANTA, GEORGIA 30309 • (404) 892-8144
FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: 2494-000 OP
PROJECT NAME: DAY 1 DETECTION MONITORING
CLIENT NAME: WILLIAM L. BONNELL
CLIENT ADDRESS AND PHONE NUMBER: 25 BONNELL St. NEWNAN, GA 30263
PROJECT MANAGER: TERRY SNELL
COPY TO: EMCON SOUTHEAST DAVE BUCHALTER
REQUESTED COMP. DATE: 11/20/92
SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☐ OTHER ____

FOR LAB USE ONLY
LAB# 38638
LAB #
PROJECT NO.
ACK | VERIFIED
QUOTE# | BS
NO. OF SAMP 8 | PG 1 | OF 1

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	ANALYSES REQUESTED: METALS Ba, Cd, Cr, Pb, Ni	LAB ID	REMARKS
1	11/3	1115		X		13S	1	1		
2	↓	1205		↓		42S	1	1		
3	↓	1210		↓		43S	1	1		
4	↓	1345		↓		44D	1	1		
5	↓	1315		↓		44S	1	1		
6	↓	1340		↓		45S	1	1		
7	↓	1300		↓		FIELD BLANK	1	~~1~~	*	blanks to receive
8	↓	1305		↓		TRIP BLANK	1	~~1~~		VOAs only per WJ

SAMPLED BY AND TITLE: PHILLIPS/ FREDERICK — DATE/TIME: 11/3/92
RELINQUISHED BY: [signature] Phillips — DATE/TIME: 11/3/92 1700
RECEIVED BY: — DATE/TIME:
RELINQUISHED BY: — DATE/TIME:
RECEIVED BY: — DATE/TIME:
RELINQUISHED BY: — DATE/TIME:
RECEIVED BY LAB: [signature] — DATE/TIME: 11/3
SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____
AIR BILL #

HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
CCC | (ICE) yes
ANA REQ | TEMP 4°C
CUST SEAL | PH
SAMPLE COND.

REMARKS: ASI/lab 8 containers

ENTERED INTO LIMS ____ COC REVIEWD ____

ASI ANALYTICAL SERVICES, INC.
ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE • ATLANTA, GEORGIA 30309 • (404) 892-8144
FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: 2494-000 OP
PROJECT NAME: DAY 2 DETECTION MONITORING
CLIENT NAME: WILLIAM L. BONNELL
CLIENT ADDRESS AND PHONE NUMBER: 25 BONNELL St. NEWNAN, GA 30263
PROJECT MANAGER: TERRY SNELL
COPY TO: EMCON SOUTHEAST, DAVE BUCHALTER
REQUESTED COMP. DATE: 11/20/92
SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☐ OTHER ____

FOR LAB USE ONLY
LAB# 38668
LAB #
PROJECT NO.
ACK | VERIFIED
QUOTE# | BS
NO. OF SAMP 8 | PG 1 | OF 1

ANALYSES REQUESTED

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	TOC/TOX	VOC *	PH, SC ONSITE	LAB ID	REMARKS
1	11/3	1130		X		13S	5	2	3			* 1,1-DICHLOROETHYLENE,
2	↓	1220		↓		42S	5	2	3			ETHYLBENZENE, PCC,
3		1225				43S	5	2	3			TOLUENE, TCE, T. XYLENES
4		1350				44D	5	2	3			VINYL CHLORIDE
5		1320				44S	4	2	2			
6		1345				45S	5	2	3			
7		1300				FIELD BLANK	5	~~2T~~	3			* blanks to receive
8	↓	1305		↓		TRIP BLANK	5	~~2T~~	3			VOAs only per WJ

SAMPLED BY AND TITLE: PHILLIPS/FREDERICK — DATE/TIME: 11/3/92
RELINQUISHED BY: Lee Phillips — DATE/TIME: 11/3/92
RECEIVED BY: — DATE/TIME:
RELINQUISHED BY: — DATE/TIME:
RECEIVED BY: — DATE/TIME:
RELINQUISHED BY: — DATE/TIME:
RECEIVED BY LAB: S E Martin — DATE/TIME: 11/4 10:23
SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____
AIR BILL #

HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
COC | (ICE) yes
ANA REQ | TEMP 4°C
CUST SEAL | PH
SAMPLE COND.

REMARKS: ASI/lab 37 containers, field/trip blanks split by JEM
ENTERED INTO LIMS ____ COC REVIEWD ____

ASI ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

390 TRABERT AVENUE • ATLANTA, GEORGIA 30309 • (404) 892-8144

FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: 2494-000 OP

PROJECT NAME: DAY 2 DETECTION MONITORING

CLIENT NAME: WILLIAM L. BONNELL

CLIENT ADDRESS AND PHONE NUMBER: 25 BONNELL St. NEWNAN, GA 30263

PROJECT MANAGER: TERRY SNELL

COPY TO: EMLON SOUTHEAST, DAVE BUCHALTER

REQUESTED COMP. DATE: 11/20/92

SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☐ OTHER ____

FOR LAB USE ONLY: LAB# 38668; LAB #; PROJECT NO.; ACK; VERIFIED; QUOTE#; BS; NO. OF SAMP 8; PG 1 OF 1

ANALYSES REQUESTED: METALS Ba, Cd, Cr, Pb, Ni

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	METALS Ba, Cd, Cr, Pb, Ni										LAB ID	REMARKS
1	11/4	1115		X		13S	1	1											
2	↓	1705		↓		42S	1	1											
3	↓	1210		↓		43S	1	1											
4	↓	1345		↓		44D	1	1											
5	↓	1315		↓		44S	1	1											
6	↓	1340		↓		45S	1	1											
7	↓	1300		↓		FIELD BLANK	1	1											* blanks to receive
8	↓	1305		↓		TRIP BLANK	1	1											VOAs only per WJ

SAMPLED BY AND TITLE: PHILLIPS/FREDERICK — DATE/TIME: 11/4/92

RELINQUISHED BY: Lee Phillips — DATE/TIME: 11/4/92

RECEIVED BY: — DATE/TIME:

RELINQUISHED BY: — DATE/TIME:

RECEIVED BY: — DATE/TIME:

RELINQUISHED BY: — DATE/TIME:

RECEIVED BY LAB: C E Martin — DATE/TIME: 11/5 2:00

SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____

AIR BILL #

HAZWRAP/NEESA Y N; QC LEVEL 1 2 3; COC (ICE); ANA REQ; TEMP; CUST SEAL; PH; SAMPLE COND.

REMARKS: ASI/lab 8 containers

ENTERED INTO LIMS ____ COC REVIEWD ____

ASI ANALYTICAL SERVICES, INC.
ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE • ATLANTA, GEORGIA 30309 • (404) 892-8144
FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: 2494-000 0P
PROJECT NAME: DAY 3 DETECTION MONITORING
CLIENT NAME: WILLIAM L. BONNELL
CLIENT ADDRESS AND PHONE NUMBER: 25 BONNELL ST. NEWNAN, GA 30263
PROJECT MANAGER: TERRY SNELL
COPY TO: EMCON SOUTHEAST DAVE BUCHALTER
REQUESTED COMP. DATE: 11/20/92
SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☐ OTHER ____

FOR LAB USE ONLY
LAB# 38699
LAB #
PROJECT NO.
ACK | VERIFIED
QUOTE# | BS
NO. OF SAMP 8 | PG 1 | OF 1

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	TOC/TOX	VOC *	pH, SC ON SITE								LAB ID	REMARKS
1	11/4	1140		X		13S	5	2	3										* 1,1-DICHLOROETHYLENE,
2		1230				42S	5	2	3										ETHYLBENZENE, PCE,
3		1235				43S	5	2	3										TOLUENE, TCE, T. XYLENES,
4		1400				44D	5	2	3										VINYL CHLORIDE
5		1330				44S	5	2	3										
6		1355				45S	5	2	3										
7		1300				FIELD BLANK	5	2	3										* blanks to receive
8		1305				TRIP BLANK	5	~~2~~	3										VOAs only per WJ

SAMPLED BY AND TITLE: PHILLIPS/FREDERICK | DATE/TIME: 11/4/92 | RELINQUISHED BY: Lee Phillips | DATE/TIME: 11/4/92
RECEIVED BY: | DATE/TIME: | RELINQUISHED BY: | DATE/TIME:
RECEIVED BY: | DATE/TIME: | RELINQUISHED BY: | DATE/TIME:
RECEIVED BY LAB: J E Martin | DATE/TIME: 11/5 2:05 | SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____ | AIR BILL #
REMARKS: ASI/lab 40 containers

HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
COC | (ICE)
ANA REQ | TEMP
CUST SEAL | PH
SAMPLE COND.

ENTERED INTO LIMS ______ COC REVIEWD ______

ASI ANALYTICAL SERVICES, INC.
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FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: 7494-000 OP
PROJECT NAME: DAY 3 DETECTION MONITORING
CLIENT NAME: WILLAM L BONNELL
CLIENT ADDRESS AND PHONE NUMBER: 25 BONNELL ST. NEWNAN, GA 30263
PROJECT MANAGER: TERRY SNELL
COPY TO: EMCON - SE DAVE BUCHALTER
REQUESTED COMP. DATE: 11/20/92
SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☐ OTHER ____

FOR LAB USE ONLY
LAB# [illegible]
LAB # 38699
PROJECT NO.
ACK | VERIFIED
QUOTE# | BS
NO. OF SAMP 8 | PG 1 | OF 1

ANALYSES REQUESTED: METALS Ba, Cd, Cr, Pb, Ni

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	METALS Ba, Cd, Cr, Pb, Ni	LAB ID	REMARKS
1	11/5	1115		X		13S	1	1		
2	↓	1205		↓		42S	1	1		
3		1210				43S	1	1		
4		1345				44D	1	1		
5		1315				44S	1	1		
6		1340				45S	1	1	*	blanks to receive
7		1300				FIELD BLANK	1	~~1~~		VOAs only per WJ
8	↓	1305		↓		TRIP BLANK	1	~~1~~		

SAMPLED BY AND TITLE: PHILLIPS / FREDERICK — DATE/TIME: 11/5/92 1115
RELINQUISHED BY: FREDERICK — DATE/TIME: 11/6/92 0730
RECEIVED BY: — DATE/TIME:
RELINQUISHED BY: — DATE/TIME:
RECEIVED BY: — DATE/TIME:
RELINQUISHED BY: — DATE/TIME:
RECEIVED BY LAB: R E Morton — DATE/TIME: 11/6 8:57
SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____
AIR BILL #
REMARKS: ASI/lab 8 containers

HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
COC | (ICE) yes
ANA REQ | TEMP 4°C
CUST SEAL | PH
SAMPLE COND.

ENTERED INTO LIMS ____ COC REVIEWD ____

ASI ANALYTICAL SERVICES, INC.

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CHAIN OF CUSTODY RECORD

PROJECT NUMBER: 2494-000 OP
PROJECT NAME: DAY4 DETECTION MONITORING
CLIENT NAME: WILLAM L. BONNELL
CLIENT ADDRESS AND PHONE NUMBER: 25 BONNELL ST. NEWNAN, GA 30263
PROJECT MANAGER: TERRY SNELL
COPY TO: EMCON SOUTHEAST DAVE BURCHALTER
REQUESTED COMP. DATE: 11/20/92
SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☐ OTHER ____

FOR LAB USE ONLY
LAB# 38716
LAB #
PROJECT NO.
ACK | VERIFIED
QUOTE# | BS
NO. OF SAMP 8 | PG 1 | OF 1

ANALYSES REQUESTED: METALS Ba, Cd, Cr, Pb, Ni

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	METALS Ba, Cd, Cr, Pb, Ni	LAB ID	REMARKS
1	11/6	1115		X		13S	1	1		
2	↓	1130		↓		42S	1	1		
3	↓	1140		↓		43S	1	1		
4	↓	1150		↓		44D	1	1		
5	↓	1155		↓		44S	1	1		
6	↓	1215		↓		45S	1	1		
7	↓	1225		↓		FIELD BLANK	1	~~1~~	*	blanks to receive
8	↓	1230		↓		TRIP BLANK	1	~~1~~		VOA only per WJ

SAMPLED BY AND TITLE: PHILLIPS/FREDERICK — DATE/TIME: 11/6/92 1115
RELINQUISHED BY: FREDERICK — DATE/TIME: 11/6/92 1600
RECEIVED BY: — DATE/TIME:
RELINQUISHED BY: — DATE/TIME:
RECEIVED BY: — DATE/TIME:
RELINQUISHED BY: — DATE/TIME:
RECEIVED BY LAB: M Kochnene ASI/lab — DATE/TIME: 11/6/92 4:00p
SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____
AIR BILL #

HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
COC ✓ (ICE)
ANA REQ Yes | TEMP 4.5
CUST SEAL No | PH
SAMPLE COND. good

REMARKS: 8 containers

ENTERED INTO LIMS ____ COC REVIEWD ____

ASI ANALYTICAL SERVICES, INC.
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FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: 2494-000 OP
PROJECT NAME: DAY 4 DETECTION MONITORING
CLIENT NAME: WILLAM L. BONNELL
CLIENT ADDRESS AND PHONE NUMBER: 25 BONNELL ST NEWNAN, GA 30263
PROJECT MANAGER: TERRY SNELL
COPY TO: EMCON-SE DAVE BUCHALTER
REQUESTED COMP. DATE: 11/20/92
SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☐ OTHER ____

FOR LAB USE ONLY
LAB# 38716
LAB #
PROJECT NO.
ACK | VERIFIED
QUOTE# | BS
NO. OF SAMP 8 | PG 1 | OF 1

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	TOC/TOX	VOC *	PH, SC ON SITE							LAB ID	REMARKS
1	11/5	1127		X		13S	5	2	3									*: 1,1 DICHLOROETHYLENE,
2	↓	1221		↓		42S	5	2	3									ETHYLBENZENE, PCE,
3	↓	1226		↓		43S	5	2	3									TOLUENE, TCE, T. XYLENE
4	↓	1347		↓		44D	5	2	3									VINYL CHLORIDE
5	↓	1321		↓		44S	5	2	3									
6	↓	1343		↓		45S	5	2	3									
7	↓	1300		↓		FIELD BLANK	5	~~2~~	3								*	blanks to receive
8	↓	1305		↓		TRIP BLANK	5	~~2~~	3									VOAs only per WJ

SAMPLED BY AND TITLE	DATE/TIME	RELINQUISHED BY	DATE/TIME
PHILLIPS / FREDERICK	11/5/92	FREDERICK	11/6/92 0730
RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME
RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME
RECEIVED BY LAB: R E Martin	DATE/TIME 11/6 8:33	SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____	AIR BILL #

HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
COC | (ICE) yes
ANA REQ | TEMP 4 °C
CUST SEAL | PH
SAMPLE COND.

REMARKS: AST/lab 40 containers

ENTERED INTO LIMS ______ COC REVIEWD ______

APPENDIX A

Quarterly Corrective Action Monitoring

ASI

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 20, 1992

P.O. No. 2494-000 OP

Report No. 38143-1

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Quarterly Monitoring, 2SR, 10/5-6/92, 1400hrs, received 10/7/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	6.49	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	970	1
Temperature (°C)(on site)(EPA 170.1)..........	22.5	-
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	12	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Victor E. Bendeck, Jr.

cc: Mr. Dave Buchalter (EMCON)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 20, 1992

P.O. No. 2494-000 OP

Attention: Mr. Terry Snell

Report No. 38143-2

Sample: Groundwater, grab, Quarterly Monitoring, 3S, 10/5-6/92, 1410hrs, received 10/7/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	7.57	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	1830	1
Temperature (°C)(on site)(EPA 170.1)	22.2	-
Total Barium (Ba)(ug/l)(EPA 6010)	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)	BDL	10.0
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,
By: Victor E. Bendeck, Jr.

cc: Mr. Dave Buchalter (EMCON)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 20, 1992

P.O. No. 2494-000 OP

Report No. 38143-3

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Quarterly Monitoring, 4S, 10/6-7/92, 1415hrs, received 10/7/92

RESULTS

	Result	Detection Limit
pH (on site) (EPA 9040)	6.20	-
Specific Conductance (umhos/cm) (EPA 9050) (on site)	57	1
Temperature (°C) (on site) (EPA 170.1)	19.3	-
Total Barium (Ba) (ug/l) (EPA 6010)	BDL	200
Total Cadmium (Cd) (ug/l) (EPA 7131)	BDL	5.0
Total Chromium (Cr) (ug/l) (EPA 7191)	18	10.0
Total Lead (Pb) (ug/l) (EPA 7421)	BDL	5.0
Total Nickel (Ni) (ug/l) (EPA 6010)	BDL	10.0
Ethylbenzene (ug/l) (EPA 8260)	BDL	2
Tetrachloroethene (ug/l) (EPA 8260)	BDL	2
Toluene (ug/l) (EPA 8260)	BDL	2
Trichloroethene (ug/l) (EPA 8260)	BDL	2
Xylenes (ug/l) (EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Victor E. Bendeck, Jr.

cc: Mr. Dave Buchalter (EMCON)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 20, 1992

P.O. No. 2494-000 OP

Attention: Mr. Terry Snell

Report No. 38143-4

Sample: Groundwater, grab, Quarterly Monitoring, 5S, 10/6-7/92, 1430hrs, received 10/7/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	5.81	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	177	1
Temperature (°C)(on site)(EPA 170.1)	18.2	-
Total Barium (Ba)(ug/l)(EPA 6010)	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)	BDL	10.0
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	15	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	5	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Victor E. Bendeck, Jr.

cc: Mr. Dave Buchalter (EMCON)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 20, 1992

P.O. No. 2494-000 OP

Report No. 38143-5

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Quarterly Monitoring, 6S, 10/5-6/92, 1245hrs, received 10/7/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.31	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	2080	1
Temperature (°C)(on site)(EPA 170.1)	19.2	-
Total Barium (Ba)(ug/l)(EPA 6010)	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)	BDL	10.0
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Victor E. Bendeck, Jr.

cc: Mr. Dave Buchalter (EMCON)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 20, 1992

P.O. No. 2494-000 OP

Attention: Mr. Terry Snell

Report No. 38143-6

Sample: Groundwater, grab, Quarterly Monitoring, 7D, 10/5-6/92, 1130hrs, received 10/7/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	5.65	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	1940	1
Temperature (°C)(on site)(EPA 170.1)	21.5	-
Total Barium (Ba)(ug/l)(EPA 6010)	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)	BDL	10.0
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	9	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Victor E. Bendeck, Jr.

cc: Mr. Dave Buchalter (EMCON)

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ANALYTICAL SERVICES, INC.

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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 20, 1992

P.O. No. 2494-000 OP

Attention: Mr. Terry Snell

Report No. 38143-7

Sample: Groundwater, grab, Quarterly Monitoring, 7S, 10/5-6/92, 1140hrs, received 10/7/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	5.59	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	2090	1
Temperature (°C)(on site)(EPA 170.1)..........	22.0	-
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Victor E. Bendeck, Jr.

cc: Mr. Dave Buchalter (EMCON)

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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 20, 1992

P.O. No. 2494-000 OP

Attention: Mr. Terry Snell

Report No. 38143-8

Sample: Groundwater, grab, Quarterly Monitoring, 12S, 10/5-6/92, 1315hrs, received 10/7/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	6.37	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	158	1
Temperature (°C)(on site)(EPA 170.1)..........	22.9	-
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,
By: Victor E. Bendeck, Jr.

cc: Mr. Dave Buchalter (EMCON)

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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 20, 1992

P.O. No. 2494-000 OP

Attention: Mr. Terry Snell

Report No. 38143-9

Sample: Groundwater, grab, Quarterly Monitoring, 13S, 10/5-6/92, 1030hrs, received 10/7/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	4.95	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)........................	148	1
Temperature (°C)(on site)(EPA 170.1)..........	18.5	-
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	68	10.0
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260)......................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260)......................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Victor E. Bendeck, Jr.

cc: Mr. Dave Buchalter (EMCON)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 20, 1992

P.O. No. 2494-000 OP

Report No. 38143-10

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Quarterly Monitoring, 15S, 10/5-6/92, 1058hrs, received 10/7/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	5.31	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	350	1
Temperature (°C)(on site)(EPA 170.1).........	19.7	-
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,
By: Victor E. Bendeck, Jr.

cc: Mr. Dave Buchalter (EMCON)

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 20, 1992

P.O. No. 2494-000 OP

Report No. 38143-11

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Quarterly Monitoring, 17D, 10/6-7/92, 1330hrs, received 10/7/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.53	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	143	1
Temperature (°C)(on site)(EPA 170.1)	18.7	-
Total Barium (Ba)(ug/l)(EPA 6010)	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)	BDL	10.0
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	53	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,
By: Victor E. Bendeck, Jr.

cc: Mr. Dave Buchalter (EMCON)

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 20, 1992

P.O. No. 2494-000 OP

Attention: Mr. Terry Snell

Report No. 38143-12

Sample: Groundwater, grab, Quarterly Monitoring, 17S, 10/6-7/92, 1315hrs, received 10/7/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)......................	5.47	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)......................	93	1
Temperature (°C)(on site)(EPA 170.1).........	18.9	-
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	43	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Victor E. Bendeck, Jr.

cc: Mr. Dave Buchalter (EMCON)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 20, 1992

P.O. No. 2494-000 OP

Attention: Mr. Terry Snell

Report No. 38143-13

Sample: Groundwater, grab, Quarterly Monitoring, 46S, 10/5-6/92, 1212hrs, received 10/7/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	6.59	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)........................	2080	1
Temperature (°C)(on site)(EPA 170.1)..........	19.8	-
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Victor E. Bendeck, Jr.

cc: Mr. Dave Buchalter (EMCON)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

November 20, 1992

P.O. No. 2494-000 OP

Attention: Mr. Terry Snell

Report No. 38143-14

Sample: Groundwater, grab, Quarterly Monitoring, 47S, 10/5-6/92, 1330hr, received 10/7/92

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.12	-
Specific Conductance (umhos/cm) (EPA 9050)(on site)	1890	1
Temperature (°C)(on site)(EPA 170.1)	21.6	-
Total Barium (Ba)(ug/l)(EPA 6010)	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)	14	10.0
Total Lead (Pb)(ug/l)(EPA 7421)	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)	BDL	10.0
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	100	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	28	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Victor E. Bendeck, Jr.

cc: Mr. Dave Buchalter (EMCON)

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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Report No. 39882-1

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 2SR, 1/4/93, 1340hrs, received 1/4/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	6.70	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)......................	867	1
Temperature (°C)(on site)(EPA 170.1)..........	16.6	-
Ethylbenzene (ug/l)(EPA 8260).................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Beier

cc: Mr. Dave Buchalter (EMCON SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Report No. 39882-2

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 3S, 1/4/93, 1350hrs, received 1/4/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	7.63	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)......................	2210	1
Temperature (°C)(on site)(EPA 170.1).........	16.5	-
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: [signature]

cc: Mr. Dave Buchalter (EMCON SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 39882-3

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 6S, 1/4/93, 1300hrs, received 1/4/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.36	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	2050	1
Temperature (°C)(on site)(EPA 170.1)	17.2	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Deier

cc: Mr. Dave Buchalter (EMCON SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Report No. 39882-4

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 7D, 1/4/93, 1115hrs, received 1/4/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	5.70	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	1699	1
Temperature (°C)(on site)(EPA 170.1)	15.5	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	23	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Blier

cc: Mr. Dave Buchalter (EMCON SE)

ASI

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 39882-5

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 7S, 1/4/93, 1030hrs, received 1/4/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	5.98	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	1800	1
Temperature (°C)(on site)(EPA 170.1)	15.3	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: *Denise S. Bier*

cc: Mr. Dave Buchalter (EMCON SE)

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ANALYTICAL SERVICES, INC.
ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Report No. 39882-6

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 12S, 1/4/93, 1450hrs, received 1/4/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.42	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	1204	1
Temperature (°C)(on site)(EPA 170.1)	14.1	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Blair

cc: Mr. Dave Buchalter (EMCON SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 39882-7

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 13S, 1/4/93, 0930hrs, received 1/4/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	4.87	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	61.4	1
Temperature (°C)(on site)(EPA 170.1)	17.3	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise L Olier

cc: Mr. Dave Buchalter (EMCON SE)

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Report No. 39882-8

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 15S, 1/4/93, 1015hrs, received 1/4/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	5.46	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)......................	783	1
Temperature (°C)(on site)(EPA 170.1).........	15.8	-
Ethylbenzene (ug/l)(EPA 8260)................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	BDL	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Deier

cc: Mr. Dave Buchalter (EMCON SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 39882-9

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 46S, 1/4/93, 1100hrs, received 1/4/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.91	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	1803	1
Temperature (°C)(on site)(EPA 170.1)	15.7	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Deer

cc: Mr. Dave Buchalter (EMCON SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 39882-10

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 47S, 1/4/93, 1415hrs, received 1/4/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	6.25	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	1689	1
Temperature (°C)(on site)(EPA 170.1)	16.0	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	51	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	15	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dein

cc: Mr. Dave Buchalter (EMCON SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 39899-1

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 4S, 1/5/93, 1145hrs, received 1/5/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)	5.70	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)	40.6	1
Temperature (°C)(on site)(EPA 170.1)	17.2	-
Ethylbenzene (ug/l)(EPA 8260)	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)	BDL	2
Toluene (ug/l)(EPA 8260)	BDL	2
Trichloroethene (ug/l)(EPA 8260)	BDL	2
Xylenes (ug/l)(EPA 8260)	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Olen

cc: Mr. Dave Buchalter (EMCON SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 39899-2

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 5S, 1/5/93, 1130hrs, received 1/5/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	5.5	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)......................	91.8	1
Temperature (°C)(on site)(EPA 170.1)..........	16.9	-
Ethylbenzene (ug/l)(EPA 8260).................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	9	2
Toluene (ug/l)(EPA 8260)......................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260)......................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Olier

cc: Mr. Dave Buchalter (EMCON SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 39899-3

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 17D, 1/5/93, 1100hrs, received 1/5/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	5.31	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)......................	117.6	1
Temperature (°C)(on site)(EPA 170.1).........	17.5	-
Ethylbenzene (ug/l)(EPA 8260).................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	55	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dier

cc: Mr. Dave Buchalter (EMCON SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Report No. 39899-4

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 17S, 1/5/93, 1115hrs, received 1/5/93

RESULTS

	Result	Detection Limit
pH (on site)(EPA 9040)........................	5.00	-
Specific Conductance (umhos/cm) (on site)(EPA 9050)........................	74.3	1
Temperature (°C)(on site)(EPA 170.1)..........	17.3	-
Ethylbenzene (ug/l)(EPA 8260).................	BDL	2
Tetrachloroethene (ug/l)(EPA 8260)...........	34	2
Toluene (ug/l)(EPA 8260).....................	BDL	2
Trichloroethene (ug/l)(EPA 8260).............	BDL	2
Xylenes (ug/l)(EPA 8260).....................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Olier

cc: Mr. Dave Buchalter (EMCON SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Report No. 39900-1

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 2SR, 1/5/93, 1020hrs, received 1/5/93

RESULTS

	Result	Detection Limit
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	12	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Deer

cc: Mr. Dave Buchalter (EMCON SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 39900-2

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 3S, 1/5/93, 1025hrs, received 1/5/93

RESULTS

	Result	Detection Limit
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Baier

cc: Mr. Dave Buchalter (EMCON SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 39900-3

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 6S, 1/5/93, 1010hrs, received 1/5/93

RESULTS

	Result	Detection Limit
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dier

cc: Mr. Dave Buchalter (EMCON SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 39900-4

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 7D, 1/5/93, 1000hrs, received 1/5/93

RESULTS

	Result	Detection Limit
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Oliver

cc: Mr. Dave Buchalter (EMCON SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 39900-5

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 7S, 1/5/93, 0955hrs, received 1/5/93

RESULTS

	Result	Detection Limit
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: *Denise S. Deir*

cc: Mr. Dave Buchalter (EMCON SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Report No. 39900-6

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 12S, 1/5/93, 1035hrs, received 1/5/93

RESULTS

	Result	Detection Limit
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dein

cc: Mr. Dave Buchalter (EMCON SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 39900-7

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 13S, 1/5/93, 0925hrs, received 1/5/93

RESULTS

	Result	Detection Limit
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	11	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise L. Beier

cc: Mr. Dave Buchalter (EMCON SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Report No. 39900-8

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 15S, 1/5/93, 0950hrs, received 1/5/93

RESULTS

	Result	Detection Limit
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dier

cc: Mr. Dave Buchalter (EMCON SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Report No. 39900-9

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 46S, 1/5/93, 1005hrs, received 1/5/93

RESULTS

	Result	Detection Limit
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Dixer

cc: Mr. Dave Buchalter (EMCON SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Report No. 39900-10

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 47S, 1/5/93, 1030hrs, received 1/5/93

RESULTS

	Result	Detection Limit
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Deen

cc: Mr. Dave Buchalter (EMCON SE)

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ANALYTICAL SERVICES, INC.
ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Report No. 39930-1

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 4S, 1/6/93, 1115hrs, received 1/6/93

RESULTS

	Result	Detection Limit
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Beier

cc: Mr. Dave Buchalter (EMCON SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Report No. 39930-2

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 5S, 1/6/93, 1120hrs, received 1/6/93

RESULTS

	Result	Detection Limit
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise L. Deier

cc: Mr. Dave Buchalter (EMCON SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Report No. 39930-3

Attention: Mr. Terry Snell

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 17D, 1/6/93, 1050hrs, received 1/6/93

RESULTS

	Result	Detection Limit
Total Barium (Ba)(ug/l)(EPA 6010).............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)...............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010).............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Deier

cc: Mr. Dave Buchalter (EMCON SE)

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

January 26, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 39930-4

Sample: Groundwater, grab, Quarterly Corrective Action Groundwater Monitoring/ HW-087, 17S, 1/6/93, 1100hrs, received 1/6/93

RESULTS

	Result	Detection Limit
Total Barium (Ba)(ug/l)(EPA 6010)............	BDL	200
Total Cadmium (Cd)(ug/l)(EPA 7131)...........	BDL	5.0
Total Chromium (Cr)(ug/l)(EPA 7191)..........	BDL	10.0
Total Lead (Pb)(ug/l)(EPA 7421)..............	BDL	5.0
Total Nickel (Ni)(ug/l)(EPA 6010)............	BDL	10.0

BDL - Below Detection Limit

Respectfully submitted,

By: Denise L. Dein

cc: Mr. Dave Buchalter (EMCON SE)

3-36000
X-111000
T-147000

ASI ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

390 TRABERT AVENUE • ATLANTA, GEORGIA 30309 • (404) 892-8144

FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER:

PROJECT NAME: QUARTERLY GW MONITORING

CLIENT NAME: WILLAM L. BONNELL

CLIENT ADDRESS AND PHONE NUMBER: 25 BONNELL ST. NEWNAN, GA 30264

PROJECT MANAGER: TERRY SNELL

COPY TO:

REQUESTED COMP. DATE: NORMAL

SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☐ OTHER ____

FOR LAB USE ONLY

LAB# 38143

LAB #

PROJECT NO.

ACK | VERIFIED

QUOTE# | BS

NO. OF SAMP 18 14 | PG 1 | OF. 3 2

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	VOC *	BARIUM, CADMIUM, CHROMIUM, LEAD, NICKEL								LAB ID	REMARKS
1	10/5	1400		X		BNGW - 2SR	3	3										* TETRACHLOROETHYLENE,
	10/6	1100		X		BNGW - 2SR	1		1									TOLUENE, TRICHLOROETHYLEN
2	10/5	1410		X		BNGW - 3S	3	3										TOTAL XYLENES
	10/6	1055		X		BNGW - 3S	1		1									
3	10/6	1415		X		BNGW - 4S	3	3										
	10/7	0915		X		BNGW - 4S	1		1									
4	10/6	1430		X		BNGW - 5S	3	3										
	10/7	0930		X		BNGW - 5S	1		1									
5	10/5	1245		X		BNGW - 6S	3	3										
	10/6	1040		X		BNGW - 6S	1		1									
6	10/5	1130		X		BNGW - 7D	3	3										
	10/6	1030		X		BNGW - 7D	1		1									
7	10/5	1140		X		BNGW - 7S	3	3										
	10/6	1025		X		BNGW - 7S	1		1									

SAMPLED BY AND TITLE: FREDERICK / BRADFORD — DATE/TIME: 10/5-7/92 0930

RELINQUISHED BY: FREDERICK / BRADFORD — DATE/TIME: 10/7/92 1615

RECEIVED BY: — DATE/TIME:

RELINQUISHED BY: — DATE/TIME:

RECEIVED BY: — DATE/TIME:

RELINQUISHED BY: — DATE/TIME:

RECEIVED BY LAB: Meyochoana ASI/Lab — DATE/TIME: 10/7/92 4:30 P

SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____

AIR BILL #

HAZWRAP/NEESA Y N

QC LEVEL 1 2 3

COC ✓ | (ICE)

ANA REQ Yes | TEMP 7.6°C

CUST SEAL NO | PH NA

SAMPLE COND. good

REMARKS: 72 Containers

ENTERED INTO LIMS ____ COC REVIEWD ____

ASI ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

390 TRABERT AVENUE • ATLANTA, GEORGIA 30309 • (404) 892-8144

FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER:

PROJECT NAME: QUARTERLY GW MONITORING

CLIENT NAME: WILLAM L. BONNELL

CLIENT ADDRESS AND PHONE NUMBER: 25 BONNELL ST. NEWNAN, GA 30269

PROJECT MANAGER: TERRY SNELL

COPY TO:

REQUESTED COMP. DATE: NORMAL

SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☐ OTHER ____

FOR LAB USE ONLY

LAB# 38143

LAB #

PROJECT NO.

ACK | VERIFIED

QUOTE# | BS

NO. OF SAMP 18 14 | PG 2 | OF 3 2

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	VOC *	BARIUM, CADMIUM CHROMIUM, LEAD NICKEL	LAB ID	REMARKS
8	10/5	1315		X		BNGW — 12S	3	3			*TETRACHLOROETHYLENE,
	10/6	1045		X		BNGW — 12S	1		1		TOLUENE, TRICHLOROETHYLEN
9	10/5	1030		X		BNGW — 13S	3	3			TOTAL XYLENES
	10/6	1015		X		BNGW - 13S	1		1		
10	10/5	1058		X		BNGW - 15S	3	3			
	10/6	1020		X		BNGW - 15S	1		1		
11	10/6	1330		X		BNGW - 17D	3	3			
	10/7	0905		X		BNGW - 17D	1		1		
12	10/6	1315		X		BNGW - 17S	3	3			
	10/7	0900		X		BNGW - 17S	1		1		
13	10/5	1212		X		BNGW - 46S	3	3			
	10/6	1035		X		BNGW - 46S	1		1		
14	10/5	1330		X		BNGW - 47S	3	3			
	10/6	1050		X		BNGW - 47S	1		1		

SAMPLED BY AND TITLE: BRADFORD / FREDERICK — DATE/TIME: 10/5-7/92 0930

RELINQUISHED BY: BRADFORD / FREDERICK — DATE/TIME: 10/7/92 1615

RECEIVED BY: — DATE/TIME:

RELINQUISHED BY: — DATE/TIME:

RECEIVED BY: — DATE/TIME:

RELINQUISHED BY: — DATE/TIME:

RECEIVED BY LAB: MGochnauer ASI/Lab — DATE/TIME: 10/7/92 4:30p

SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____

AIR BILL #

HAZWRAP/NEESA Y N

QC LEVEL 1 2 3

COC ✓ (ICE)

ANA REQ Yes — TEMP 7.6

CUST SEAL NO — PH NA

SAMPLE COND. good

REMARKS: 72 containers

ENTERED INTO LIMS ____ COC REVIEWD ____

ASI ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

390 TRABERT AVENUE • ATLANTA, GEORGIA 30309 • (404) 892-8144

FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER:

PROJECT NAME: QUARTERLY GW MONITORING

CLIENT NAME: William L. Bonnell

CLIENT ADDRESS AND PHONE NUMBER: 25 BONNELL ST, NEWNAN GA 30264

PROJECT MANAGER: Terry Snell

COPY TO:

REQUESTED COMP. DATE: Normal

SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☐ OTHER ____

FOR LAB USE ONLY: LAB# 38143 | LAB # | PROJECT NO. | ACK | VERIFIED | QUOTE# | BS | NO. OF SAMP 18 | PG 3 | OF 3

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	VOC *	Barium, Cadmium, Lead, Chrome, Nickel	LAB ID	REMARKS
	10/6			X		Trip Blank	4	3	1		* PCE, TCE, Toluene,
	10/7			X		Trip Blank	4	3	1		Total Xylenes
	10/6			X		Field Blank	4	3	1		
	10/6			X		Equip. Blank	4	3	1		

SAMPLED BY AND TITLE: FREDERICK	DATE/TIME: 10/7/92 0930	RELINQUISHED BY: FREDERICK	DATE/TIME: 10/8/92 1615
RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME
RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME
RECEIVED BY LAB: M Cochrane ASI/lab	DATE/TIME: 10/7/92 4:30P	SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____	AIR BILL #

HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
COC ✓
ANA REQ Yes
CUST SEAL No
SAMPLE COND. good
(ICE)
TEMP 1.6°C
PH NA

REMARKS: 72 Containers

ENTERED INTO LIMS ____ COC REVIEWD ____

ASI ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

390 TRABERT AVENUE • ATLANTA, GEORGIA 30309 • (404) 892-8144
FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: HW-087
PROJECT NAME: QUARTERLY/CORRECTIVE ACTION GROUNDWATER MONITORING
CLIENT NAME: THE WILLIAM L. BONNELL Co. INC
CLIENT ADDRESS AND PHONE NUMBER: PO BOX 428 NEWNAN, GA 30264 404/254-7890
PROJECT MANAGER: TERRY D. SNELL
COPY TO: DAVE BURCHALTER EMCON SOUTHEAST
REQUESTED COMP. DATE: 1/22/93
SAMPLING REQUIREMENTS: SDWA NPDES RCRA ✓ OTHER

FOR LAB USE ONLY
LAE# 39882
LAE #
PROJECT NO.
ACK / VERIFIED
QUOTE# / BS
NO. OF SAMP 12 / PG 1 / OF 1

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	pH (ON SITE)	SPECIFIC CONDUCTANCE (ON SITE)	TEMPERATURE (ON SITE)	VOC					LAB ID	REMARKS
25R	1/4/93	1340		X		GROUNDWATER					3						
3S	1/4/93	1350		↓		↓					3						
6S	1/4/93	1300		↓		↓					3						
7D	1/4/93	1115		↓		↓					3						
7S	1/4/93	1030		↓		↓					3						
12S	1/4/93	1450		↓		↓					3						
13S	1/4/93	0930		↓		↓					3						
15S	1/4/93	1015		↓		↓					3						
46S	1/4/93	1100		↓		↓					3						
47S	1/4/93	1415		↓		↓					3						
						TRIP BLANK					3						
		1125				FIELD BLANK					3						

SAMPLED BY AND TITLE: FREDERICK E PHILLIPS — DATE/TIME: 1/4/93 0930
RELINQUISHED BY: FREDERICK E PHILLIPS — DATE/TIME: 1/4/93 1645
RECEIVED BY: — DATE/TIME:
RELINQUISHED BY: — DATE/TIME:
RECEIVED BY: — DATE/TIME:
RELINQUISHED BY: — DATE/TIME:
RECEIVED BY LAB: M. Zender ASI/LAB — DATE TIME: 1/4/93 1700 hrs
SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER
AIR BILL #

HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
COC ✓ — ICE
ANA REQ — TEMP 6.6°C
CUST SEAL No — PH N/A
SAMPLE COND.

REMARKS: 36 Containers

ENTERED INTO LIMS
COC REVIEWD

APPENDIX A

Mobile Lab Data
for Surface Water Analyses
on 10/20/92 and 10/21/92

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

October 28, 1992

Mr. Terry Snell
William L. Bonnell & Co.
25 Bonnell Street
Newnan, Georgia 30264

Dear Terry:

Enclosed you will you find the reissued field gas chromatograph data summary for the environmental investigations conducted on October 20th and 21st. I have incorporated your requested format changes including:

* Changing the detection limit terminology from Not Detected (ND) to Below Detection Limit (BDL);
* Report as the State detection limits as opposed to the instrument's detection limits; and
* Providing the analyst's signature on each summary.

ASI appreciates the opportunity to provide our services to your corporation. Should you have any questions or require further assistance, please contact me at (404)892-8144.

Sincerely,

Danny Brookshire
Mobile Laboratory Manager

BONNELL2

ANALYTICAL SERVICES, INC.

Mobile Laboratories

Data Sheet

Project Name:Bonnell Surface Waters — Operator:Danny Brookshire
Client:Bonnell/Loren McCune — Date:10/21/92

Sample ID	*Benzene*	*Toluene*	*Ethyl-Benzene*	*Total Xylene*	*Trichloro-Ethylene*	*Perchloro-Ethylene*
Storm Sewer Creek at Foot Bridge	BDL	BDL	BDL	BDL	BDL	BDL
Maintenance Yard Ditch (Lower)	BDL	BDL	BDL	BDL	BDL	BDL
Storm Sewer Pipe	BDL	BDL	BDL	BDL	BDL	BDL
Storm Creek at Dam Near #6	BDL	BDL	BDL	BDL	BDL	BDL
Seep Near Storm Sewer Pipe	BDL	2584	136	923	7.0	120
Maintenance Yard Ditch (Upper)	BDL	BDL	BDL	BDL	BDL	BDL
Detection Limit	2	2	2	5	2	2

<u>NOTES</u>: * Results are reported in ug/l = Parts-Per-Billion.
* Analytical Method - <u>*Headspace Technique Using a Mobile GC for Volatile Organics*</u> (Spittler - US EPA Region I Laboratory)
* BDL = Below Detection Limit

Analyst Signature: [signature] Date: 10/25/92

ANALYTICAL SERVICES, INC.

Mobile Laboratories

Data Sheet

Project Name: Bonnell Surface Waters
Client: Bonnell/Loren McCune

Operator: Danny Brookshire
Date: 10/20/92

Sample ID	*Benzene*	*Toluene*	*Ethyl-Benzene*	*Total Xylene*	*Trichloro-Ethylene*	*Perchloro-Ethylene*
Flume Effluent Above Polishing Discharge.0939hrs	BDL	BDL	BDL	BDL	BDL	BDL
Flume Effluent at NPDES Sample Point	BDL	BDL	BDL	BDL	BDL	2
Spring	BDL	BDL	BDL	BDL	7	249
Stream on Knox Property	BDL	BDL	BDL	BDL	2	5
Storm Creek @ Dam	BDL	BDL	BDL	BDL	4.5	15
Inlet to Charcoal Canister	BDL	7	BDL	2	6	148
Flume Effluent Above Polishing Discharge.1645hrs	BDL	BDL	BDL	BDL	BDL	BDL
Mineral Springs Near Well #8	BDL	BDL	BDL	BDL	BDL	BDL
Detection Limit	2	2	2	5	2	2

<u>NOTES:</u> * Results are reported in ug/l = Parts-Per-Billion.
* Analytical Method - *<u>Headspace Technique Using a Mobile GC for Volatile Organics</u>* (Spittler - US EPA Region I Laboratory)
* BDL = Below Detection Limit

Analyst Signature: [signature] Date: 10/28/92

APPENDIX A

Aquifer Test Data

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

December 23, 1992

P.O. No. 2494 000 OP
Object Code 1.2026.45

Attention: Mr. Terry Snell

Report No. 39378-1

Sample: Groundwater, grab, CAP Aquifer Testing, DW1, 12/3/92, 1418hrs. received 12/8/92

RESULTS

Volatile Organics (EPA 8260)	Result (ug/l)	Detection Limit (ug/l)
Tetrachloroethene	120	2
Toluene	BDL	2
Trichloroethene	7	2
Vinyl chloride	BDL	2
Ethylbenzene	BDL	2
1,1-Dichloroethene	BDL	2
Xylenes	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: [signature]

cc: Mr. Dave Buchalter
EMCON

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

December 23, 1992

P.O. No. 2494 000 OP
Object Code 1.2026.45

Attention: Mr. Terry Snell

Report No. 39378-2

Sample: Groundwater, grab, CAP Aquifer Testing, DW1, 12/4/92, 1425hrs, received 12/8/92

RESULTS

Volatile Organics (EPA 8260)	Result (ug/l)	Detection Limit (ug/l)
Tetrachloroethene	280	2
Toluene	BDL	2
Trichloroethene	13	2
Vinyl chloride	BDL	2
Ethylbenzene	BDL	2
1,1-Dichloroethene	BDL	2
Xylenes	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: [signature]

cc: Mr. Dave Buchalter
EMCON

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

December 23, 1992

P.O. No. 2494 000 OP
Object Code 1.2026.45

Attention: Mr. Terry Snell

Report No. 39378-3

Sample: Groundwater, grab, CAP Aquifer Testing, DW1, 12/5/92, 1430hrs, received 12/8/92

RESULTS

Volatile Organics (EPA 8260)	Result (ug/l)	Detection Limit (ug/l)
Tetrachloroethene	300	2
Toluene	BDL	2
Trichloroethene	14	2
Vinyl chloride	BDL	2
Ethylbenzene	BDL	2
1,1-Dichloroethene	BDL	2
Xylenes	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Billy P. Dyer

cc: Mr. Dave Buchalter
EMCON

ASI
ANALYTICAL SERVICES, INC.
ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

December 23, 1992

P.O. No. 2494 000 OP
Object Code 1.2026.45

Attention: Mr. Terry Snell

Report No. 39378-4

Sample: Groundwater, grab, CAP Aquifer Testing, DW1, 12/6/92, 1:50hrs
received 12/8/92

RESULTS

Volatile Organics (EPA 8260)	Result (ug/l)	Detection Limit (ug/l)
Tetrachloroethene	290	2
Toluene	BDL	2
Trichloroethene	12	2
Vinyl chloride	BDL	2
Ethylbenzene	BDL	2
1,1-Dichloroethene	BDL	2
Xylenes	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: [signature]

cc: Mr. Dave Buchalter
EMCON

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

December 31, 1992

P.O. No. 2494-000 OP
Object Code: 1.2026.45

Attention: Mr. Terry Snell

Report No. 39691-1

Sample: Groundwater, grab, CAP Aquifer Testing, DW2, 12/18/92, 1650hrs. received 12/21/92

RESULTS

Volatile Organics (EPA 8260)	Result (ug/l)	Detection Limit (ug/l)
Tetrachloroethene............................	70	2
Toluene......................................	10	2
Trichloroethene..............................	BDL	2
Vinyl chloride...............................	BDL	2
Ethylbenzene.................................	BDL	2
1,1-Dichloroethene...........................	BDL	2
Xylenes......................................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: [signature]

cc: Mr. Dave Buchalter
(EMCON SE)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

December 31, 1992

P.O. No. 2494-000 OP
Object Code: 1.2026.45

Attention: Mr. Terry Snell

Report No. 39691-2

Sample: Groundwater, grab, CAP Aquifer Testing, DW2, 12/19/92, 1600hrs. received 12/21/92

RESULTS

Volatile Organics (EPA 8260)	Result (ug/l)	Detection Limit (ug/l)
Tetrachloroethene	10	2
Toluene	BDL	2
Trichloroethene	10	2
Vinyl chloride	BDL	2
Ethylbenzene	BDL	2
1,1-Dichloroethene	BDL	2
Xylenes	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Billy Dyer

cc: Mr. Dave Buchalter
(EMCON SE)

ASI ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE ● ATLANTA, GEORGIA 30309 ● (404) 892-8144
FAX (404)892-2740 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

December 31, 1992

P.O. No. 2494-000 OP
Object Code: 1.2026.45
Report No. 39691-3

Attention: Mr. Terry Snell

Sample: Groundwater, grab, CAP Aquifer Testing, DW2, 12/20/92, 1100hrs.
received 12/21/92

RESULTS

Volatile Organics (EPA 8260)	Result (ug/l)	Detection Limit (ug/l)
Tetrachloroethene..............................	80	2
Toluene..............................	BDL	2
Trichloroethene..............................	10	2
Vinyl chloride..............................	BDL	2
Ethylbenzene..............................	BDL	2
1,1-Dichloroethene..............................	BDL	2
Xylenes..............................	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

By: Betty P. Dyer

cc: Mr. Dave Buchalter
(EMCON SE)

APPENDIX A

Chain of Custody Records

ASI ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

390 TRABERT AVENUE • ATLANTA, GEORGIA 30309 • (404) 892-8144

FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: 1.2026.
PROJECT NAME: Corrective Action Plan

CLIENT NAME: William L Bunnell

CLIENT ADDRESS AND PHONE NUMBER: 25 Bunnell St. Newnan GA

PROJECT MANAGER: Terry Snell

COPY TO: Dave Buchalter (Lincoln Southeast)

REQUESTED COMP. DATE: Normal

SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☒ OTHER ____

ANALYSES REQUESTED: ~~TOC/TOX~~; Permit VOCs; ~~pH, Sp. Cond.~~; ~~Permit Metals~~

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	~~TOC/TOX~~	Permit VOCs	~~pH, Sp. Cond.~~	~~Permit Metals~~	LAB ID	REMARKS
1	12/18	1650		X		D-2 GW	2		X				Permit VOCs:
2	12/19	1600		X		D-2 Groundwater	2		X				1,1-dichloroethylene;
3	12/20	1100		X		D-2 Groundwater	1		X				ethylbenzene; PCE;
													Toluene;
													TCE; Total xylenes;
													vinyl chloride

FOR LAB USE ONLY

LAB#

LAB #

PROJECT NO.

ACK | VERIFIED

QUOTE# | BS

NO. OF SAMP | PG | OF

SAMPLED BY AND TITLE: [signature] DATE/TIME: 12/18-12/20/92
RELINQUISHED BY: [signature] DATE/TIME: 12-21-92

RECEIVED BY: [signature] DATE/TIME: 12/21/92 1357
RELINQUISHED BY: DATE/TIME:

RECEIVED BY: DATE/TIME:
RELINQUISHED BY: DATE/TIME:

RECEIVED BY LAB: DATE/TIME:

SAMPLE SHIPPED VIA: UPS BUS FED-EX HAND (circled) OTHER ____

AIR BILL #

HAZWRAP/NEESA Y N

QC LEVEL 1 2 3

COC | ~~ICE~~

ANA REQ | TEMP

CUST SEAL | PH

SAMPLE COND.

REMARKS: [illegible] Hold Time

ENTERED INTO LIMS ____ COC REVIEWD ____

ASI ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

390 TRABERT AVENUE • ATLANTA, GEORGIA 30309 • (404) 892-8144

FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: 3040.007.92

PROJECT NAME: Lowell

CLIENT NAME: Emcon Southeast

PROJECT MANAGER: Chad Burkhalter

COPY TO:

REQUESTED COMP. DATE: 24 Hours Rush

SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☐ OTHER ____

CLIENT ADDRESS AND PHONE NUMBER: Emcon 1575 Parkside Dr #135 Atlanta 30311 404 555 5600

ANALYSES REQUESTED: Sewer Permit Metals: Cd, Cr, Pb, Ni, Ba

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	Metals: Cd, Cr, Pb, Ni, Ba	LAB ID
Dur-2	12/14/92	10:00 / 12:00				Wet Clean Slip Test	2	X	

FOR LAB USE ONLY

LAB#

LAB #

PROJECT NO.

ACK | VERIFIED

QUOTE# | BS

NO. OF SAMP | PG | OF

REMARKS: Composite Prior to Testing for:
- Cadmium
- Chromium
- Lead
- Nickel
- Barium

24 Hour Rush

SAMPLED BY AND TITLE: Joe Lewis	DATE/TIME: 12/14/92 10:00 / 12:00	RELINQUISHED BY: Joe Lewis	DATE/TIME: 12/15/92 9:35am
RECEIVED BY: [illegible]	DATE/TIME: 12/15 9:30	RELINQUISHED BY:	DATE/TIME
RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME
RECEIVED BY LAB:	DATE/TIME	SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____	AIR BILL #

HAZWRAP/NEESA Y N

QC LEVEL 1 2 3

COC | (ICE)

ANA REQ | TEMP

CUST SEAL | PH

SAMPLE COND.

REMARKS

ENTERED INTO LIMS | COC REVIEWD

APPENDIX B

Aquifer Test Data

APPENDIX B

Constant Drawdown Data - PW1

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
Dates of Test: 3/09/90 to 3/12/90
Pump on:Date 3/09/90 Time:1422
Pump off:Date 3/11/90 Time:1815
Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft): 0
Static water level (ft): 6.80
Maximum drawdown (ft): 9.75

RECOVERY DATA – RESIDUAL DRAWDOWN (s')

PW-1

Time since pump stopped t'(min)	Water depth (ft)	s'(ft)
0.2	9.4	0.35
0.5	9.2	0.55
0.75	9	0.75
1	8.81	0.94
1.25	8.64	1.11
1.5	8.51	1.24
1.75	8.37	1.38
2.1	8.2	1.55
2.7	8	1.75
3.25	7.84	1.91
3.55	7.76	1.99
4	7.68	2.07
4.45	7.66	2.09
5.8	7.55	2.2
5.1	7.5	2.25
5.7	7.45	2.3
6.25	7.4	2.35
6.75	7.35	2.4
7.45	7.32	2.43
8	7.28	2.47
9	7.24	2.51
10	7.22	2.53
12	7.17	2.58
15.7	7.15	2.6
20	7.1	2.65
25	7.09	2.66

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
Dates of Test: 3/09/90 to 3/12/90
Pump on:Date 3/09/90 Time:1422
Pump off:Date 3/11/90 Time:1815
Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft): 0
Static water level (ft): 6.80
Maximum drawdown (ft): 9.75

RECOVERY DATA – RESIDUAL DRAWDOWN (s')

PW-1

Time since pump stopped t'(min)	Water depth (ft)	s'(ft)
35	7.05	2.7
45	7.02	2.73
60	7	2.75
90	6.97	2.78
231	6.91	2.84
286	6.91	2.84
345	6.9	2.85
530	6.88	2.87
713	6.89	2.86
790	6.84	2.91
1005	6.87	2.88
1412	6.75	3
1568	6.67	3.08

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
Dates of Test: 3/09/90 to 3/12/90
Pump on:Date 3/09/90 Time:1422
Pump off:Date 3/11/90 Time:1815
Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft): 0
Static water level (ft): 6.80
Maximum drawdown (ft): 9.75

DRAWDOWN DATA (s)

PW-1

Time since pump started t (min)	Water depth (ft)	s (ft)
0.00	6.96	0
0.25	7.50	0.54
0.75	7.79	0.83
1.18	7.95	0.99
1.50	8.05	1.09
2.00	8.11	1.15
2.50	8.16	1.2
3.00	8.20	1.24
3.50	8.24	1.28
4.00	8.26	1.3
4.75	8.29	1.33
5.50	8.31	1.35
6.50	8.34	1.38
7.50	8.36	1.4
8.50	8.38	1.42
10.00	8.39	1.43
12.25	8.41	1.45
15.00	8.43	1.47
17.00	8.44	1.48
20.17	8.46	1.5
25.50	8.40	1.44
34.00	8.40	1.44
35.42	8.45	1.49
35.80	8.47	1.51
36.17	8.50	1.54
36.92	8.50	1.54

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
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Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating well)
Distance from pumping well (ft): 0
Static water level (ft): 6.80

DRAWDOWN DATA (s)

PW–1

Time since pump started t (min)	Water depth (ft)	s (ft)
38.00	8.52	1.56
40.27	8.52	1.56
43.75	8.68	1.72
44.25	8.86	1.9
44.55	8.96	2
45.22	9.14	2.18
46.00	9.26	2.3
46.50	9.33	2.37
47.00	9.40	2.44
47.50	9.44	2.48
48.00	9.47	2.51
49.00	9.50	2.54
50.00	9.55	2.59
51.00	9.59	2.63
52.00	9.60	2.64
54.67	9.63	2.67
56.67	9.63	2.67
60.00	9.56	2.6
63.60	9.73	2.77
64.13	9.87	2.91
64.50	9.91	2.95
65.17	10.04	3.08
65.83	10.10	3.14
66.67	10.15	3.19
67.50	10.21	3.25
69.00	10.28	3.32
70.50	10.34	3.38

AQUIFER TEST DATA

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Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating well)
Distance from pumping well (ft): 0
Static water level (ft): 6.80

DRAWDOWN DATA (s)

PW-1

Time since pump started t (min)	Water depth (ft)	s (ft)
72.00	10.38	3.42
75.00	10.28	3.32
92.50	10.35	3.39
105.00	10.30	3.34
120.00	10.21	3.25
150.00	10.10	3.14
163.00	10.25	3.29
190.00	10.27	3.31
248.00	10.21	3.25
308.00	10.11	3.15
368.00	10.02	3.06
428.00	9.72	2.76
488.00	9.73	2.77
548.00	9.73	2.77
608.00	9.75	2.79
668.00	9.77	2.81
728.00	9.81	2.85
799.00	9.87	2.91
868.00	9.82	2.86
944.00	9.78	2.82
998.00	9.73	2.77
1077.00	9.69	2.73
1150.00	9.72	2.76
1215.00	9.75	2.79
1272.00	9.95	2.99
1333.00	9.93	2.97
1394.00	9.80	2.84

AQUIFER TEST DATA

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Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating well)
Distance from pumping well (ft): 0
Static water level (ft): 6.80

DRAWDOWN DATA (s)

PW−1

Time since pump started t (min)	Water depth (ft)	s (ft)
1451.00	9.83	2.87
1513.00	9.80	2.84
1574.00	9.67	2.71
1656.00	9.60	2.64
1828.00	9.65	2.69
1983.00	9.72	2.76
2138.00	9.73	2.77
2273.00	9.83	2.87
2436.00	9.79	2.83
2578.00	9.78	2.82
2739.00	9.76	2.8
2799.00	9.88	2.92
2869.00	9.93	2.97
2951.00	9.91	2.95
2968.00	12.15	5.19
3039.00	9.77	2.81
3094.00	9.75	2.79

AQUIFER TEST DATA

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Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft):
Static water level (ft): 13.99

DRAWDOWN DATA (s)

Pz–1

Time since pump started t (min)	Water depth (ft)	s (ft)
7.75	14	0.01
18.5	14	0.01
26.25	14	0.01
28.5	13.99	0
45.33	13.99	0
60.75	13.99	0
76.25	13.98	−0.01
188.5	13.97	−0.02
258	13.96	−0.03
308	13.98	−0.01
368	13.96	−0.03
428	13.98	−0.01
488	13.94	−0.05
548	13.93	−0.06
608	13.93	−0.06
676	13.92	−0.07
736	13.93	−0.06
807	13.94	−0.05
873	13.92	−0.07
951	13.92	−0.07
1005	13.93	−0.06
1085	13.94	−0.05
1166	13.94	−0.05
1227	13.94	−0.05
1286	13.93	−0.06
1343	13.93	−0.06
1405	13.92	−0.07

AQUIFER TEST DATA

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Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft):
Static water level (ft): 13.99

DRAWDOWN DATA (s)

Pz–1

Time since pump started t (min)	Water depth (ft)	s (ft)
1463	13.92	–0.07
1525	13.92	–0.07
1665	13.92	–0.07
1835	13.92	–0.07
1989	13.96	–0.03
2138	13.96	–0.03
2280	13.94	–0.05
2438	13.95	–0.04
2578	13.95	–0.04
2730	13.95	–0.04
2790	13.94	–0.05
2860	13.94	–0.05
2959	13.94	–0.05
3042	13.94	–0.05
3094	13.94	–0.05

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
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Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft):
Static water level (ft): 5.03
Maximum drawdown (ft): 5.10

DRAWDOWN DATA (s)

Pz-2

Time since pump started t (min)	Water depth (ft)	s (ft)
0	5.03	0
2.5	5.03	0
8.1	5.03	0
11.5	5.03	0
14.75	5.03	0
17.5	5.03	0
22.5	5.03	0
25.25	5.03	0
29.25	5.03	0
32.5	5.03	0
37	5.03	0
41	5.04	0.01
44.5	5.04	0.01
60	5.03	0
65.42	5.04	0.01
110	5.05	0.02
182	5.05	0.02
253	5.05	0.02
308	5.08	0.05
368	5.07	0.04
428	5.09	0.06
488	5.07	0.04
548	5.05	0.02
613	5.07	0.04
671	5.06	0.03
731	5.06	0.03

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
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Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft):
Static water level (ft): 5.03
Maximum drawdown (ft): 5.10

DRAWDOWN DATA (s)

Pz-2

Time since pump started t (min)	Water depth (ft)	s (ft)
802	5.07	0.04
871	5.06	0.03
946	5.08	0.05
1000	5.05	0.02
1080	5.04	0.01
1155	5.08	0.05
1219	5.08	0.05
1277	5.07	0.04
1336	5.07	0.04
1398	5.07	0.04
1458	5.07	0.04
1518	5.08	0.05
1579	5.06	0.03
1660	5.05	0.02
1830	5.07	0.04
1984	5.07	0.04
2137	5.07	0.04
2272	5.08	0.05
2439	5.08	0.05
2579	5.09	0.06
2737	5.1	0.07
2797	5.08	0.05
2867	5.08	0.05
2956	5.08	0.05
3044	5.08	0.05
3095	5.1	0.07

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
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Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft):
Static water level (ft): 7.74
Maximum drawdown (ft): 7.88

DRAWDOWN DATA (s)

Pz−3

Time since pump started t (min)	Water depth (ft)	s (ft)
0	7.74	0
1	7.77	0.03
4	7.78	0.04
7.5	7.78	0.04
11	7.79	0.05
14	7.8	0.06
17	8.8	1.06
21	8.8	1.06
24.75	8.8	1.06
28.5	8.8	1.06
32	8.8	1.06
36.5	7.79	0.05
40	7.79	0.05
43.7	7.79	0.05
49	7.8	0.06
59	7.82	0.08
73	7.83	0.09
113	7.84	0.1
184	7.84	0.1
254	7.84	0.1
308	7.88	0.14
368	7.93	0.19
428	7.86	0.12
548	7.84	0.1
615	7.85	0.11
673	7.89	0.15

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
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Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft):
Static water level (ft): 7.74
Maximum drawdown (ft): 7.88

DRAWDOWN DATA (s)

Pz−3

Time since pump started t (min)	Water depth (ft)	s (ft)
732	7.89	0.15
803	7.94	0.2
870	7.84	0.1
947	7.84	0.1
1002	7.8	0.06
1082	7.81	0.07
1157	7.84	0.1
1221	7.86	0.12
1280	7.87	0.13
1338	7.87	0.13
1400	7.86	0.12
1460	7.86	0.12
1520	7.86	0.12
1582	7.84	0.1
1662	7.81	0.07
1832	7.85	0.11
1986	7.86	0.12
2138	7.86	0.12
2273	7.87	0.13
2441	7.87	0.13
2580	7.87	0.13
2738	7.88	0.14
2798	7.87	0.13
2868	7.86	0.12
2958	7.87	0.13
3045	7.88	0.14

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
Dates of Test: 3/09/90 to 3/12/90
Pump on:Date 3/09/90 Time:1422
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Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft):
Static water level (ft): 7.74
Maximum drawdown (ft): 7.88

DRAWDOWN DATA (s)

Pz-3

Time since pump started t (min)	Water depth (ft)	s (ft)
3098	7.88	0.14

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
Dates of Test: 3/09/90 to 3/12/90
Pump on:Date 3/09/90 Time:1422
Pump off:Date 3/11/90 Time:1815
Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft):
Static water level (ft): 7.18

DRAWDOWN DATA (s)

Pz−4

Time since pump started t (min)	Water depth (ft)	s (ft)
0.25	7.18	0
0.5	7.18	0
0.75	7.19	0.01
1	7.2	0.02
1.25	7.22	0.04
1.5	7.24	0.06
1.75	7.26	0.08
2	7.28	0.1
2.5	7.32	0.14
3	7.35	0.17
3.5	7.38	0.2
4	7.4	0.22
4.5	7.43	0.25
5	7.44	0.26
5.5	7.46	0.28
6	7.5	0.32
6.5	7.5	0.32
7	7.51	0.33
7.5	7.53	0.35
8	7.52	0.34
8.5	7.54	0.36
9	7.55	0.37
9.5	7.56	0.38
10	7.57	0.39
11	7.59	0.41
12	7.59	0.41
13	7.6	0.42

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
Dates of Test: 3/09/90 to 3/12/90
Pump on:Date 3/09/90 Time:1422
Pump off:Date 3/11/90 Time:1815
Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft):
Static water level (ft): 7.18

DRAWDOWN DATA (s)

Pz–4

Time since pump started t (min)	Water depth (ft)	s (ft)
14	7.61	0.43
15	7.62	0.44
16	7.63	0.45
17	7.63	0.45
18	7.64	0.46
19	7.65	0.47
20	7.66	0.48
21	7.65	0.47
22	7.66	0.48
22	7.65	0.47
23	7.65	0.47
24	7.65	0.47
25	7.65	0.47
26	7.65	0.47
27	7.66	0.48
28	7.65	0.47
29	7.65	0.47
30	7.65	0.47
34	7.65	0.47
36	7.65	0.47
37	7.66	0.48
38	7.68	0.5
39	7.68	0.5
41	7.68	0.5
42	7.68	0.5
43	7.69	0.51
44	7.68	0.5

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
Dates of Test: 3/09/90 to 3/12/90
Pump on:Date 3/09/90 Time:1422
Pump off:Date 3/11/90 Time:1815
Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft):
Static water level (ft): 7.18

DRAWDOWN DATA (s)

Pz-4

Time since pump started t (min)	Water depth (ft)	s (ft)
45	7.72	0.54
46	7.75	0.57
47	7.8	0.62
48	7.83	0.65
49	7.84	0.66
50	7.88	0.7
51	7.91	0.73
53	7.94	0.76
54	7.95	0.77
55	7.96	0.78
56	7.98	0.8
57	7.98	0.8
58	7.98	0.8
59	7.98	0.8
60	7.98	0.8
61	7.99	0.81
63	7.97	0.79
64	7.98	0.8
65	7.99	0.81
66	8.03	0.85
67	8.06	0.88
68	8.09	0.91
69	8.1	0.92
71	8.14	0.96
73	8.17	0.99
75	8.18	1
89	8.1	0.92

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
Dates of Test: 3/09/90 to 3/12/90
Pump on:Date 3/09/90 Time:1422
Pump off:Date 3/11/90 Time:1815
Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft):
Static water level (ft): 7.18

DRAWDOWN DATA (s)

Pz−4

Time since pump started t (min)	Water depth (ft)	s (ft)
99	8.12	0.94
149	8.12	0.94
191	8.15	0.97
248	8.13	0.95
308	8.11	0.93
368	8.11	0.93
428	8.02	0.84
488	8.01	0.83
548	8.01	0.83
616	8	0.82
674	8.01	0.83
733	8.03	0.85
804	8.04	0.86
871	8.02	0.84
948	8.04	0.86
1007	7.95	0.77
1082	7.94	0.76
1110	7.98	0.8
1223	8.01	0.83
1282	8.07	0.89
1340	8.06	0.88
1401	8.05	0.87
1452	8.05	0.87
1521	8.02	0.84
1583	7.97	0.79
1659	7.93	0.75
1833	7.98	0.8

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
Dates of Test: 3/09/90 to 3/12/90
Pump on:Date 3/09/90 Time:1422
Pump off:Date 3/11/90 Time:1815
Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft):
Static water level (ft): 7.18

DRAWDOWN DATA (s)

Pz−4

Time since pump started t (min)	Water depth (ft)	s (ft)
1986	7.98	0.8
2138	8.01	0.83
2273	8.05	0.87
2442	8.04	0.86
2581	8.03	0.85
2738	8.03	0.85
2798	8.05	0.87
2868	8.06	0.88
2961	8.03	0.85
3046	7.99	0.81
3099	7.98	0.8

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
Dates of Test: 3/09/90 to 3/12/90
Pump on:Date 3/09/90 Time:1422
Pump off:Date 3/11/90 Time:1815
Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft):
Static water level (ft): 9.72

DRAWDOWN DATA (s)

Pz-5

Time since pump started t (min)	Water depth (ft)	s (ft)
4	9.72	0
4.75	9.72	0
10.25	9.72	0
13.25	9.73	0.01
16.25	9.73	0.01
20.25	9.73	0.01
24.5	9.73	0.01
27.8	9.73	0.01
31	9.73	0.01
35.5	9.72	0
39.1	9.72	0
42.75	9.72	0
47.5	9.73	0.01
62.5	9.73	0.01
78	9.74	0.02
120	9.73	0.01
185	9.75	0.03
		-9.72
1083	9.77	0.05
1163	9.79	0.07
1224	9.8	0.08
1283	9.81	0.09
1341	9.81	0.09
1503	9.81	0.09
1451	9.81	0.09
1518	9.82	0.1
1586	9.83	0.11

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
Dates of Test: 3/09/90 to 3/12/90
Pump on:Date 3/09/90 Time:1422
Pump off:Date 3/11/90 Time:1815
Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft):
Static water level (ft): 9.72

DRAWDOWN DATA (s)

Pz–5

Time since pump started t (min)	Water depth (ft)	s (ft)
1657	9.81	0.09
1828	9.83	0.11
1982	9.86	0.14
2141	9.83	0.11
2283	9.83	0.11
2438	9.87	0.15
2579	9.84	0.12
2733	9.85	0.13
2793	9.88	0.16
2863	9.86	0.14
2958	9.86	0.14
3042	9.87	0.15
2096	9.88	0.16

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
Dates of Test: 3/09/90 to 3/12/90
Pump on:Date 3/09/90 Time:1422
Pump off:Date 3/11/90 Time:1815
Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft): 31
Static water level (ft): 6.96
Maximum drawdown (ft): 10.73

DRAWDOWN DATA (s)

Pz–6

Time since pump started t (min)	Water depth (ft)	s (ft)
0.00	10.56	0.00
38.25	10.56	0.00
77.58	10.58	0.02
118.58	10.59	0.03
186.58	10.6	0.04
250	10.61	0.05
310	10.62	0.06
365	10.65	0.09
420	10.63	0.07
500	10.63	0.07
700	10.63	0.07
800	10.63	0.07
865	10.64	0.08
965	10.65	0.09
1084.00	10.64	0.08
1164.00	10.65	0.09
1342.00	10.65	0.09
1524.00	10.66	0.10
1583.00	10.66	0.10
1653.00	10.65	0.09
1794.00	10.68	0.12
1853.00	10.68	0.12
1948.00	10.67	0.11
2098.00	10.69	0.13
2248.00	10.68	0.12
2404.00	10.70	0.14

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
Dates of Test: 3/09/90 to 3/12/90
Pump on:Date 3/09/90 Time:1422
Pump off:Date 3/11/90 Time:1815
Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft): 31
Static water level (ft): 6.96
Maximum drawdown (ft): 10.73

DRAWDOWN DATA (s)

Pz–6

Time since pump started t (min)	Water depth (ft)	s (ft)
2468.00	10.71	0.15
2544.00	10.70	0.14
2698.00	10.70	0.14
2758.00	10.69	0.13
2868.00	10.69	0.13
2964.00	10.70	0.14
3046.00	10.70	0.14
3104.00	10.71	0.15

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
Dates of Test: 3/09/90 to 3/12/90
Pump on:Date 3/09/90 Time:1422
Pump off:Date 3/11/90 Time:1815
Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft): 31
Static water level (ft): 6.96
Maximum drawdown (ft): 10.73

RECOVERY DATA – RESIDUAL DRAWDOWNS (s')

PZ–6

Time since pump stopped tr (min)	Time since pump started t (min)	Ratio t/tr	Water depth (ft)	s' (ft)	s (ft) calc	s–s' (ft) calc
31.00	3135	101.13	10.71	0.15	0.1856	0.0356
32.00	3136	98.00	10.7	0.14	0.1857	0.0457
33.00	3137	95.06	10.69	0.13	0.1857	0.0557
34.00	3138	92.29	10.69	0.13	0.1858	0.0558
35.00	3139	89.69	10.69	0.13	0.1859	0.0559
36.00	3140	87.22	10.69	0.13	0.1859	0.0559
38.00	3142	82.68	10.71	0.15	0.1861	0.0361
39.00	3143	80.59	10.7	0.14	0.1862	0.0462
40.00	3144	78.60	10.69	0.13	0.1862	0.0562
41.00	3145	76.71	10.69	0.13	0.1863	0.0563
42.00	3146	74.90	10.69	0.13	0.1864	0.0564
43.00	3147	73.19	10.68	0.12	0.1864	0.0664
44.00	3148	71.55	10.68	0.12	0.1865	0.0665

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
Dates of Test: 3/09/90 to 3/12/90
Pump on:Date 3/09/90 Time:1422
Pump off:Date 3/11/90 Time:1815
Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft): 31
Static water level (ft): 6.96
Maximum drawdown (ft): 10.73

RECOVERY DATA – RESIDUAL DRAWDOWNS (s')

PZ–6

Time since pump stopped tr (min)	Time since pump started t (min)	Ratio t/tr	Water depth (ft)	s'(ft)	s (ft) calc	s–s'(ft) calc
45.00	3149	69.98	10.68	0.12	0.1866	0.0666
48.00	3152	65.67	10.69	0.13	0.1868	0.0568
49.00	3153	64.35	10.68	0.12	0.1869	0.0669
52.00	3156	60.69	10.69	0.13	0.1871	0.0571
55.00	3159	57.44	10.69	0.13	0.1873	0.0573
59.00	3163	53.61	10.68	0.12	0.1876	0.0676
63.00	3167	50.27	10.68	0.12	0.1879	0.0679
68.00	3172	46.65	10.68	0.12	0.1882	0.0682
75.00	3179	42.39	10.68	0.12	0.1887	0.0687
85.00	3189	37.52	10.68	0.12	0.1894	0.0694
90.00	3194	35.49	10.67	0.11	0.1898	0.0798
157.00	3261	20.77	10.65	0.09	0.1944	0.1044
216.00	3320	15.37	10.64	0.08	0.1985	0.1185

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
Dates of Test: 3/09/90 to 3/12/90
Pump on:Date 3/09/90 Time:1422
Pump off:Date 3/11/90 Time:1815
Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft): 31
Static water level (ft): 6.96
Maximum drawdown (ft): 10.73

RECOVERY DATA – RESIDUAL DRAWDOWNS (s')

PZ–6

Time since pump stopped tr (min)	Time since pump started t (min)	Ratio t/tr	Water depth (ft)	s' (ft)	s (ft) calc	s–s' (ft) calc
272.00	3376	12.41	10.63	0.07	0.2022	0.1322
333.00	3437	10.32	10.62	0.06	0.2063	0.1463
505.00	3609	7.15	10.61	0.05	0.2172	0.1672
692.00	3796	5.49	10.6	0.04	0.2286	0.1886
770.00	3874	5.03	10.6	0.04	0.2332	0.1932
835.00	3939	4.72	10.6	0.04	0.2369	0.1969
915.00	4019	4.39	10.61	0.05	0.2414	0.1914
975.00	4079	4.18	10.61	0.05	0.2447	0.1947
1025.00	4129	4.03	10.61	0.05	0.2475	0.1975
1390.00	4494	3.23	10.56	0	0.2665	0.2665
1548.00	4652	3.01	10.53	–0.03	0.2743	0.3043

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
Dates of Test: 3/09/90 to 3/12/90
Pump on:Date 3/09/90 Time:1422
Pump off:Date 3/11/90 Time:1815
Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft):
Static water level (ft): 9.63

DRAWDOWN DATA (s)

MW-2d

Time since pump started t (min)	Water depth (ft)	s (ft)
11	9.65	0.02
13.25	9.66	0.03
15.73	9.66	0.03
19	9.66	0.03
24.25	9.65	0.02
42.5	9.66	0.03
55.5	9.68	0.05
74	9.69	0.06
195	9.74	0.11
252	9.72	0.09
308	9.74	0.11
368	9.75	0.12
428	9.71	0.08
488	9.73	0.1
548	9.73	0.1
612	9.74	0.11
670	9.74	0.11
730	9.75	0.12
801	9.78	0.15
870	9.79	0.16
945	9.76	0.13
999	9.74	0.11
1080	9.72	0.09
1153	9.74	0.11
1218	9.75	0.12
1275	9.79	0.16
1336	9.77	0.14

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
Dates of Test: 3/09/90 to 3/12/90
Pump on:Date 3/09/90 Time:1422
Pump off:Date 3/11/90 Time:1815
Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft):
Static water level (ft): 9.63

DRAWDOWN DATA (s)

MW−2d

Time since pump started t (min)	Water depth (ft)	s (ft)
1397	9.71	0.08
1453	9.71	0.08
1516	9.78	0.15
1577	9.77	0.14
1658	9.74	0.11
1830	9.77	0.14
1984	9.77	0.14
2138	9.79	0.16
2273	9.78	0.15
2438	9.79	0.16
2577	9.8	0.17
2737	9.82	0.19
2797	9.82	0.19
2867	9.79	0.16
2953	9.8	0.17
3042	9.82	0.19
3100	9.82	0.19

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
Dates of Test: 3/09/90 to 3/12/90
Pump on:Date 3/09/90 Time:1422
Pump off:Date 3/11/90 Time:1815
Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft):
Static water level (ft): 8.37

DRAWDOWN DATA (s)

MW-2s

Time since pump started t (min)	Water depth (ft)	s (ft)
9	8.38	0.01
11.67	8.39	0.02
14.25	8.39	0.02
17.92	8.39	0.02
22	8.39	0.02
39	8.4	0.03
53	8.41	0.04
59	8.42	0.05
73	8.44	0.07
195	8.49	0.12
250	8.49	0.12
328	8.51	0.14
368	8.53	0.16
428	8.52	0.15
489	8.53	0.16
549	8.53	0.16
611	8.54	0.17
669	8.53	0.16
728	8.54	0.17
800	8.55	0.18
869	8.56	0.19
945	8.57	0.2
999	8.58	0.21
1080	8.56	0.19
1153	8.57	0.2
1218	8.57	0.2
1274	8.58	0.21

AQUIFER TEST DATA

Test Location: Bonnell, inc., Newnan, Ga
Dates of Test: 3/09/90 to 3/12/90
Pump on:Date 3/09/90 Time:1422
Pump off:Date 3/11/90 Time:1815
Duration of pumping: 51.7 hours (3104 minutes)
Duration of recovery: 27 hours (1600 minutes)
Avg. Discharge (gpm): .66 to .625
Thickness of aquifer (b): 20 ft.
(based on length of screen for
partially penetrating pumping well)
Distance from pumping well (ft):
Static water level (ft): 8.37

DRAWDOWN DATA (s)

MW-2s

Time since pump started t (min)	Water depth (ft)	s (ft)
1332	8.58	0.21
1394	8.58	0.21
1458	8.59	0.22
1513	8.62	0.25
1572	8.58	0.21
1654	8.57	0.2
1825	8.58	0.21
1980	8.64	0.27
2134	8.58	0.21
2269	6.62	-1.75
2434	8.61	0.24
2576	8.63	0.26
2734	8.62	0.25
2794	8.64	0.27
2844	8.64	0.27
2929	8.62	0.25
3016	8.63	0.26
3071	8.69	0.32

APPENDIX B

Constant Drawdown Dawa - DW2

WELL DW-2

Time Since Pump Started t (min)	Water Depth (ft.)	Drawdown (ft.)	Groundwater Elevation (ft. MSL)
0	21.33	0.00	888.62
2	23.20	1.87	886.75
3.33	23.43	2.10	886.52
5.833	23.48	2.15	886.47
7.333	23.48	2.15	886.47
9	23.58	2.25	886.37
10.833	23.63	2.30	886.32
13.166	23.62	2.29	886.33
15.166	23.63	2.30	886.32
17.166	23.63	2.30	886.32
20	23.65	2.32	886.30
20.833	23.65	2.32	886.30
25.25	23.68	2.35	886.27
30	23.69	2.36	886.26
36.166	23.72	2.39	886.23
41.166	23.74	2.41	886.21
46.333	23.74	2.41	886.21
51.666	23.73	2.40	886.22
57.333	23.73	2.40	886.22
62.5	23.73	2.40	886.22
75.333	23.75	2.42	886.20
85	23.80	2.47	886.15
95	23.80	2.47	886.15
105	23.90	2.57	886.05
135	23.60	2.27	886.35
185	23.93	2.60	886.02
245	23.95	2.62	886.00
305	23.81	2.48	886.14
351	24.00	2.67	885.95
411	24.01	2.68	885.94
471	24.10	2.77	885.85
531	24.03	2.70	885.92
591	24.10	2.77	885.85
658	24.12	2.79	885.83
712	23.95	2.62	886.00
771	23.95	2.62	886.00
833	24.20	2.87	885.75
893	24.25	2.92	885.70
953	24.20	2.87	885.75
1013	24.25	2.92	885.70
1076	24.15	2.82	885.80

WELL DW-2

Time Since Pump Started t (min)	Water Depth (ft.)	Drawdown (ft.)	Groundwater Elevation (ft. MSL)
1134	24.28	2.95	885.67
1196	24.33	3.00	885.62
1253	24.35	3.02	885.60
1316	24.20	2.87	885.75
1377	24.35	3.02	885.60
1435	24.35	3.02	885.60
1493	24.35	3.02	885.60
1555	24.37	3.04	885.58
1673	24.30	2.97	885.65
1793	24.42	3.09	885.53
1913	24.44	3.11	885.51
2033	24.42	3.09	885.53
2153	24.42	3.09	885.53
2273	24.43	3.10	885.52
2393	24.46	3.13	885.49
2513	24.46	3.13	885.49
2638	24.49	3.16	885.46
2753	24.55	3.22	885.40
2883	24.52	3.19	885.43

PIEZOMETER T-5

Time Since Pump Started t (min)	Water Depth (ft.)	Drawdown (ft.)	Groundwater Elevation (ft. MSL)
0	22.00	0	888.57
2.67	22.11	0.11	888.46
4.67	22.15	0.15	888.42
5.67	22.12	0.12	888.45
8.333	22.22	0.22	888.35
9.33	22.25	0.25	888.32
12.33	22.28	0.28	888.29
13.5	22.29	0.29	888.28
16.83	22.30	0.30	888.27
18.5	22.32	0.32	888.25
22.42	22.34	0.34	888.23
23.83	22.35	0.35	888.22
27	22.37	0.37	888.20
33	22.38	0.38	888.19
37	22.41	0.41	888.16
42	22.42	0.42	888.15
48	22.42	0.42	888.15
53	22.45	0.45	888.12
57	22.47	0.47	888.10
71	22.48	0.48	888.09
83	22.54	0.54	888.03
93	22.56	0.56	888.01
103	22.59	0.59	887.98
133	22.62	0.62	887.95
183	22.63	0.63	887.94
243	22.67	0.67	887.90
303	22.68	0.68	887.89

PIEZOMETER T-5

Time Since Pump Started t (min)	Water Depth (ft.)	Drawdown (ft.)	Groundwater Elevation (ft. MSL)
349	22.70	0.70	887.87
409	22.73	0.73	887.84
469	22.76	0.76	887.81
529	22.80	0.80	887.77
589	22.83	0.83	887.74
666	22.82	0.82	887.75
716	22.95	0.95	887.62
771	22.90	0.90	887.67
835	23.03	1.03	887.54
896	22.85	0.85	887.72
951	22.88	0.88	887.69
1011	22.90	0.90	887.67
1074	22.90	0.90	887.67
1131	22.93	0.93	887.64
1197	22.96	0.96	887.61
1250	22.97	0.97	887.60
1312	22.97	0.97	887.60
1373	22.97	0.97	887.60
1433	22.97	0.97	887.60
1491	22.96	0.96	887.61
1553	22.98	0.98	887.59
1670	22.98	0.98	887.59
1790	22.99	0.99	887.58
1910	23.01	1.01	887.56
2030	23.00	1.00	887.57
2150	23.00	1.00	887.57
2270	23.00	1.00	887.57
2390	23.03	1.03	887.54
2510	23.04	1.04	887.53
2635	23.05	1.05	887.52
2750	23.10	1.10	887.47
2879	23.05	1.05	887.52

PIEZOMETER T-6

Time Since Pump Started t (min)	Water Depth (ft.)	Drawdown (ft.)	Groundwater Elevation (ft. MSL)
0	21.57	0.00	889.27
1	21.61	0.04	889.23
3.33	21.75	0.18	889.09
6.33	21.83	0.26	889.01
7.42	21.85	0.28	888.99
10	21.93	0.36	888.91
11.5	21.96	0.39	888.88
14.33	21.99	0.42	888.85
15.83	22.00	0.43	888.84
20.17	22.09	0.52	888.75
21.5	22.10	0.53	888.74
24.5	22.10	0.53	888.74
29.33	22.14	0.57	888.70
35.33	22.16	0.59	888.68
40	22.17	0.60	888.67
45	22.20	0.63	888.64
49	22.21	0.64	888.63
56	22.22	0.65	888.62
61	22.23	0.66	888.61
74	22.26	0.69	888.58
83	22.30	0.73	888.54
93	22.31	0.74	888.53
103	22.32	0.75	888.52
133	22.37	0.80	888.47
183	22.40	0.83	888.44
243	22.45	0.88	888.39
303	22.49	0.92	888.35

PIEZOMETER T-6

Time Since Pump Started t (min)	Water Depth (ft.)	Drawdown (ft.)	Groundwater Elevation (ft. MSL)
349	22.50	0.93	888.34
409	22.55	0.98	888.29
469	22.58	1.01	888.26
529	22.62	1.05	888.22
589	22.63	1.06	888.21
656	22.63	1.06	888.21
712	22.65	1.08	888.19
770	22.67	1.10	888.17
833	22.68	1.11	888.16
893	22.70	1.13	888.14
950	22.72	1.15	888.12
1010	22.74	1.17	888.10
1073	22.71	1.14	888.13
1131	22.77	1.20	888.07
1195	22.80	1.23	888.04
1252	22.83	1.26	888.01
1310	22.81	1.24	888.03
1374	22.82	1.25	888.02
1432	22.83	1.26	888.01
1490	22.82	1.25	888.02
1552	22.84	1.27	888.00
1612	22.83	1.26	888.01
1732	22.86	1.29	887.98
1852	22.87	1.30	887.97
1972	22.86	1.29	887.98
2092	22.86	1.29	887.98
2212	22.88	1.31	887.96

WELL 4-S

Time Since Pump Started t (min)	Water Depth (ft.)	Drawdown (ft.)	Groundwater Elevation (ft. MSL)
0	20.52	0	888.52
1	20.54	0.02	888.50
2	20.55	0.03	888.49
3	20.55	0.03	888.49
4	20.57	0.05	888.47
5	20.58	0.06	888.46
6	20.57	0.05	888.47
7	20.57	0.05	888.47
8	20.58	0.06	888.46
9	20.58	0.06	888.46
10	20.58	0.06	888.46
11	20.58	0.06	888.46
12	20.58	0.06	888.46
13	20.58	0.06	888.46
14	20.58	0.06	888.46
15	20.59	0.07	888.45
16	20.59	0.07	888.45
17	20.59	0.07	888.45
18	20.59	0.07	888.45
19	20.59	0.07	888.45
20	20.59	0.07	888.45
25	20.60	0.08	888.44
30	20.60	0.08	888.44
35	20.60	0.08	888.44
40	20.61	0.09	888.43
45	20.61	0.09	888.43
50	20.62	0.10	888.42
55	20.63	0.11	888.41
60	20.64	0.12	888.40
70	20.64	0.12	888.40
80	20.64	0.12	888.40
90	20.64	0.12	888.40
100	20.65	0.13	888.39
130	20.68	0.16	888.36
160	20.71	0.19	888.33
220	20.69	0.17	888.35
280	20.71	0.19	888.33
338	20.74	0.22	888.30
398	20.78	0.26	888.26
458	20.79	0.27	888.25
523	20.84	0.32	888.20
583	20.83	0.31	888.21

WELL 4-S

Time Since Pump Started t (min)	Water Depth (ft.)	Drawdown (ft.)	Groundwater Elevation (ft. MSL)
643	20.85	0.33	888.19
704	20.85	0.33	888.19
757	20.87	0.35	888.17
820	20.90	0.38	888.14
883	20.84	0.32	888.20
937	20.85	0.33	888.19
996	20.87	0.35	888.17
1062	20.89	0.37	888.15
1117	20.92	0.40	888.12
1183	20.94	0.42	888.10
1239	20.95	0.43	888.09
1298	20.95	0.43	888.09
1364	20.93	0.41	888.11
1419	20.94	0.42	888.10
1481	20.92	0.40	888.12
1539	20.94	0.42	888.10
1657	20.94	0.42	888.10
1777	20.95	0.43	888.09
1897	20.96	0.44	888.08
2017	20.95	0.43	888.09
2137	20.98	0.46	888.06
2257	20.98	0.46	888.06
2377	20.98	0.46	888.06
2497	21.02	0.50	888.02
2620	21.03	0.51	888.01
2737	21.04	0.52	888.00
2864	21.05	0.53	887.99

WELL 4-D

Time Since Pump Started t (min)	Water Depth (ft.)	s (ft.)	Groundwater Elevation (ft. MSL)
0	22.00		
22	22.12	0.12	888.34
27	22.13	0.13	888.33
32	22.16	0.16	888.30
37	22.15	0.15	888.31
42	22.16	0.16	888.30
47	22.16	0.16	888.30
52	22.16	0.16	888.30
57	22.16	0.16	888.30
72	22.17	0.17	888.29
77	22.18	0.18	888.28
87	22.19	0.19	888.27
97	22.20	0.20	888.26
137	22.23	0.23	888.23
177	22.24	0.24	888.22
237	22.25	0.25	888.21
297	22.28	0.28	888.18
357	22.30	0.30	888.16
417	22.32	0.32	888.14
477	22.32	0.32	888.14
537	22.35	0.35	888.11
597	22.36	0.36	888.10
657	22.36	0.36	888.10
723	22.36	0.36	888.10
775	22.22	0.22	888.24
838	22.37	0.37	888.09
901	22.37	0.37	888.09
955	22.39	0.39	888.07
1015	22.39	0.39	888.07
1081	22.42	0.42	888.04
1135	22.43	0.43	888.03
1200	22.45	0.45	888.01
1257	22.46	0.46	888.00
1317	22.47	0.47	887.99
1379	22.45	0.45	888.01
1437	22.43	0.43	888.03
1499	22.48	0.48	887.98

WELL 4-D

Time Since Pump Started t (min)	Water Depth (ft.)	s (ft.)	Groundwater Elevation (ft. MSL)
1556	22.46	0.46	888.00
1676	22.47	0.47	887.99
1796	22.48	0.48	887.98
1916	22.47	0.47	887.99
2035	22.48	0.48	887.98
2155	22.48	0.48	887.98
2275	22.49	0.49	887.97
2395	22.5	0.50	887.96
2515	22.52	0.52	887.94
2638	22.53	0.53	887.93
2755	22.56	0.56	887.90
2882	22.55	0.55	887.91

WELL 5-S

Time since Pump Started t (min)	Water Depth (ft.)	Drawdown (ft.)	Groundwater Elevation (ft. MSL)
0	21.50	0.00	887.76
73	21.50	0.00	887.76
90	21.50	0.00	887.76
131	21.51	0.01	887.75
192	21.50	0.00	887.76
420	21.54	0.04	887.72
550	21.58	0.08	887.68
665	21.56	0.06	887.70
789	21.58	0.08	887.68
903	21.55	0.05	887.71
1800	21.55	0.05	887.71
1922	21.55	0.05	887.71
2040	21.55	0.05	887.71
2160	21.56	0.06	887.70
2280	21.56	0.06	887.70
2400	21.56	0.06	887.70
2520	21.58	0.08	887.68
2643	21.58	0.08	887.68
2756	21.61	0.11	887.65

WELL 17-S

Time Since Pump Started t (min)	Water Depth (ft.)	Drawdown (ft.)	Groundwater Elevation (ft. MSL)
0	23.61	0.00	888.90
68	23.66	0.05	888.85
94	23.66	0.05	888.85
135	23.71	0.10	888.80
203	23.77	0.16	888.74
425	23.81	0.20	888.70
545	23.86	0.25	888.65
670	23.90	0.29	888.61
795	23.93	0.32	888.58
909	23.82	0.21	888.69
1024	23.84	0.23	888.67
1141	23.87	0.26	888.64
1261	23.90	0.29	888.61
1386	23.90	0.29	888.61
1805	23.90	0.29	888.61
1926	23.90	0.29	888.61
2046	23.90	0.29	888.61
2166	23.91	0.30	888.60
2286	23.93	0.32	888.58
2406	23.94	0.33	888.57
2526	23.95	0.34	888.56
2645	23.95	0.34	888.56
2758	23.99	0.38	888.52
2890	23.96	0.35	888.55

WELL 17-D

Time Since Pump Started t (min)	Water Depth (ft.)	Drawdown (ft.)	Groundwater Elevation (ft. MSL)
0	23.40	0.00	888.88
67	23.45	0.05	888.83
94	23.47	0.07	888.81
135	23.50	0.10	888.78
202	23.51	0.11	888.77
425	23.57	0.17	888.71
545	23.59	0.19	888.69
670	23.61	0.21	888.67
794	23.62	0.22	888.66
908	23.63	0.23	888.65
1023	23.64	0.24	888.64
1140	23.67	0.27	888.61
1261	23.71	0.31	888.57
1385	23.70	0.30	888.58
1497	23.67	0.27	888.61
1806	23.70	0.30	888.58
1927	23.70	0.30	888.58
2047	23.70	0.30	888.58
2167	23.71	0.31	888.57
2287	23.73	0.33	888.55
2407	23.74	0.34	888.54
2527	23.75	0.35	888.53
2645	23.76	0.36	888.52
2758	23.80	0.40	888.48
2890	23.78	0.38	888.50

WELL 18-D

Time Since Pump Started t (min)	Water Depth (ft.)	Drawdown (ft.)	Groundwater Elevation (ft. MSL)
0	14.85	0	888.73
76	14.91	0.06	888.67
92	14.92	0.07	888.66
133	14.96	0.11	888.62
196	14.95	0.10	888.63
420	15.02	0.17	888.56
550	15.04	0.19	888.54
670	15.06	0.21	888.52
792	15.05	0.20	888.53
906	15.07	0.22	888.51
1803	15.13	0.28	888.45
1924	15.12	0.27	888.46
2044	15.13	0.28	888.45
2164	15.14	0.29	888.44
2284	15.15	0.30	888.43
2404	15.16	0.31	888.42
2524	15.17	0.32	888.41
2645	15.19	0.34	888.39
2758	15.22	0.37	888.36

WELL 18-S

Time Since Pump Started t (min)	Water Depth (ft.)	Drawdown (ft.)	Groundwater Elevation (ft. MSL)
0	14.60	0.00	888.90
76	14.68	0.08	888.82
90	14.69	0.09	888.81
92	14.71	0.11	888.79
132	14.72	0.12	888.78
195	14.78	0.18	888.72
420	14.80	0.20	888.70
550	14.81	0.21	888.69
670	14.81	0.21	888.69
791	14.81	0.21	888.69
905	14.82	0.22	888.68
1802	14.87	0.27	888.63
1923	14.87	0.27	888.63
2043	14.87	0.27	888.63
2163	14.87	0.27	888.63
2283	14.88	0.28	888.62
2403	14.89	0.29	888.61
2523	14.91	0.31	888.59
2645	14.92	0.32	888.58
2757	14.97	0.37	888.53

WELL DW-2

Time Since Pump Stopped t (min)	Water Depth (ft.)	Residual Drawdown s' (ft.)	Groundwater Elevation (ft. MSL)
0	24.52	3.19	885.43
5	22.05	0.72	887.90
10	21.97	0.64	887.98
15	21.90	0.57	888.05
20	21.80	0.47	888.15
325	21.73	0.40	888.22
1060	21.60	0.27	888.35
1750	21.55	0.22	888.40
2500	21.51	0.18	888.44

Top of Casing = 909.95 (MSL)

PIEZOMETER T-5

Time Since Pump Stopped t (min)	Water Depth (ft.)	Residual Drawdown s' (ft.)	Groundwater Elevation (ft. MSL)
0	23.05	1.05	887.52
3	23.03	1.03	887.54
10	22.90	0.90	887.67
20	22.79	0.79	887.78
60	22.61	0.61	887.96
325	22.45	0.45	888.12
1060	22.29	0.29	888.28

Top of Casing = 910.57 (MSL)

PIEZOMETER T-6

Time Since Pump Stopped t (min)	Water Depth (ft.)	Residual Drawdown s' (ft.)	Groundwater Elevation (ft. MSL)
0	22.92	1.35	887.92
3	22.83	1.26	888.01
10	22.60	1.03	888.24
20	22.39	0.82	888.45
61	22.17	0.60	888.67
325	21.97	0.40	888.87
1060	21.80	0.23	889.04

Top of Casing = 910.84 (MSL)

WELL 4-S

Time Since Pump Stopped t (min)	Water Depth (ft.)	Residual Drawdown s' (ft.)	Groundwater Elevation (ft. MSL)
0	21.05	0.53	887.99
13	21.02	0.50	888.02
23	21.00	0.48	888.04
63	20.97	0.45	888.07
325	20.92	0.40	888.12
1060	20.79	0.27	888.25
1750	20.71	0.19	888.33
2500	20.66	0.14	888.38

Top of Casing = 909.04 (MSL)

WELL 4-D

Time Since Pump Stopped t (min)	Water Depth (ft.)	Residual Drawdown s' (ft.)	Groundwater Elevation (ft. MSL)
0	22.55	0.55	887.91
13	22.41	0.41	888.05
23	22.39	0.39	888.07
64	22.37	0.37	888.09
325	22.25	0.25	888.21
1060	22.13	0.13	888.33
1750	22.06	0.06	888.40
2500	22.04	0.04	888.42

Top of Casing = 910.46 (MSL)

WELL 5-S

Time Since Pump Stopped t (min)	Water Depth (ft.)	Residual Drawdown s' (ft.)	Groundwater Elevation (ft. MSL)
0	21.61	0.11	887.65
68	21.57	0.07	887.69
325	21.59	0.09	887.67
1060	21.51	0.01	887.75
1750	21.46	-0.04	887.80
2500	21.44	-0.06	887.82

Top of Casing = 909.26 (MSL)

WELL 17-S

Time Since Pump Stopped t (min)	Water Depth (ft.)	Residual Drawdown s' (ft.)	Groundwater Elevation (ft. MSL)
0	23.99	0.38	888.52
73	23.92	0.31	888.59
325	23.88	0.27	888.63
1060	23.81	0.20	888.70
1750	23.74	0.13	888.77
2500	23.70	0.09	888.81

Top of Casing = 912.51 (MSL)

WELL 17-D

Time Since Pump Stopped t (min)	Water Depth (ft.)	Residual Drawdown s' (ft.)	Groundwater Elevation (ft. MSL)
0	23.80	0.40	888.48
73	23.71	0.31	888.57
325	23.66	0.26	888.62
1060	23.56	0.16	888.72
1750	23.50	0.10	888.78
2500	23.46	0.06	888.82

Top of Casing = 912.28 (MSL)

WELL 18-D

Time Since Pump Stopped t (min)	Water Depth (ft.)	Residual Drawdown s' (ft.)	Groundwater Elevation (ft. MSL)
0	15.22	0.37	888.36
68	15.08	0.23	888.50
325	15.03	0.18	888.55
1060	14.94	0.09	888.64
1750	14.88	0.03	888.70
2500	14.85	0.00	888.73

Top of Casing = 903.58 (MSL)

WELL 18-S

Time Since Pump Stopped t (min)	Water Depth (ft.)	Residual Drawdown s' (ft.)	Groundwater Elevation (ft. MSL)
0	14.97	0.37	888.53
68	14.87	0.27	888.63
325	14.84	0.24	888.66
1060	14.73	0.13	888.77
1750	14.67	0.07	888.83
2500	14.65	0.05	888.85

Top of Casing = 903.5 (MSL)

APPENDIX B

Constant Drawdown Calculations

EMCON SOUTHEAST COMPUTATION SHEET

PROJECT TITLE: Aquifer Test
PROJECT NO. 2040.007.92
DESCRIPTION: DW2 and T5
SHEET ___ OF ___
PREPARED BY: DSB
DATE: 2/93
CHK'D BY: ___
DATE: ___

T5

$t = 200 \text{ min}$

$s = .67 ft.$

$\frac{1}{u} = 200$ from match pt.

$w(u) = 4.7$

$$T = \frac{Q \, W(u)}{4\pi s}$$

$$= \frac{.936 \, ft^3/mn \;\; 4.7}{4\pi \; .67}$$

$$T = .517 \, ft^2/min$$

$b = \sim 21 ft.$

$$K = 2.5 \times 10^{-2} \, ft/min$$

$$= 1.25 \times 10^{-2} \, cm/sec.$$

$$S = \frac{4 \, u \, T \, t}{r^2}$$

$$= \frac{4 \; 200^{-1} \; .517 \; (200}{10^2}$$

$$= 2.1 \times 10^{-2}$$

TIME(MIN)	LEVEL	DRAWDOWN	TIME(MIN)	LEVEL	DRAWDOWN	TIME(MIN)	LEVEL	DRAWDOWN

Plot drawdown (s) and time (t) on page two, overlay type curve transparency for match, photocopy, remove type curve transparency, circle match point, enter match point parameters below for T, K, and S determinations.

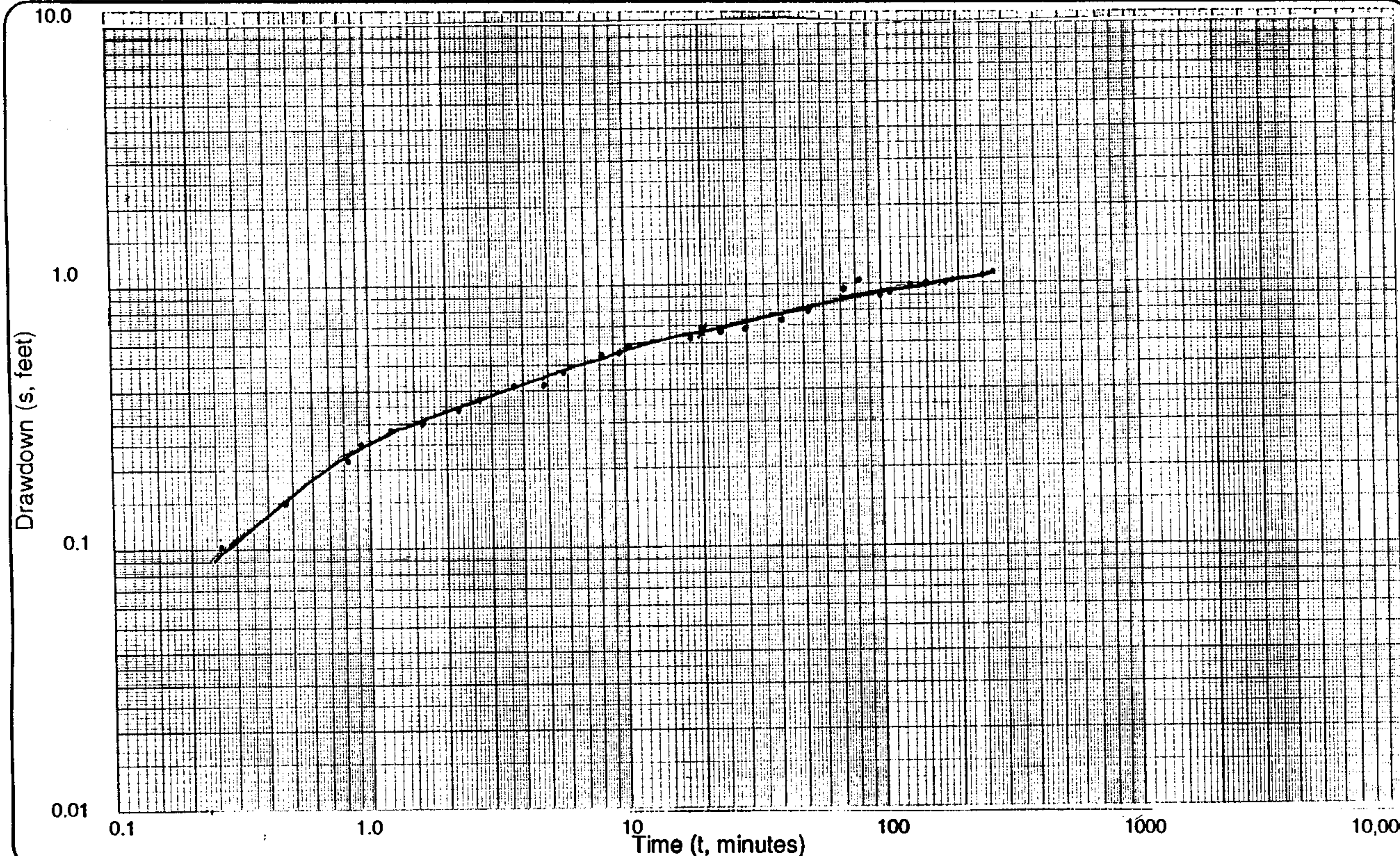
THEIS METHOD AQUIFER TEST ANALYSIS

Aquifer Unit Saprolite
Radial Distance (R,ft) 10 Aquifer Thickness (b,ft) 21
Bearing from Discharge Well ____
Discharge Rate (Q,ft^3/min) .936
From Match Point (page two):
s= .67 (ft), t= 200 (min), W(u)= 4.7, 1/u= 200
T(transmissivity, ft^2/min)=[Q/(4x3.14xs)]xW(u)
T= .517 (ft^2/min), K=T/b= 2.5×10^{-2} (ft/min)
or Tx1440= 744 (ft^2/day), Kx1440= 36 (ft/day)

S(storativity)= 4uxT(ft^2/min)t/(R^2)= 2.1×10^{-2}

Client: Bonrel
Project: CAP
Project # 2040.007.92
Well: DW2 - T5
Date: 2/93
Hydrogeologist: DSB
Weather: ____
Recover/Drawdown (circle one) — Drawdown circled

EMCON
SOUTHEAST



THEIS METHOD AQUIFER TEST ANALYSIS DRAWDOWN PLOT

Client:
Project:
Project#
Location:
Well #: DW2-T5

Comments:

EMCON
SOUTHEAST

Page [illegible] of two

EMCON SOUTHEAST COMPUTATION SHEET

PROJECT TITLE: Aquifer Testing at DW2 — PROJECT NO. 2040.007.92
DESCRIPTION: Theis Curve DW2-T6 — SHEET ___ OF ___
PREPARED BY: D. Buchalter DATE: ______ CHK'D BY: ______ DATE: ______

T6

$t = 200$ from match pt.
$s = .86$

$\frac{1}{u} = 200$

$W(u) = 4.7$

$$T = \frac{Q \quad W(u)}{4 \pi s}$$

$$= \frac{.936 \; ft^2/min \quad 4.7}{4\pi \quad .86 ft.}$$

$T = .407 \; ft^2/min \qquad b = 21 ft.$

$K = 1.9 \times 10^{-2} \; ft/min$

$K = 9.8 \times 10^{-3} \; cm/sec.$

$$S = \frac{4uTt}{r^2}$$

$$= 4 \quad 200^{-1} \cdot \frac{.407 \; ft^2/min \quad 200 min}{10^2}$$

$= 1.6 \times 10^{-2}$

TIME(MIN)	LEVEL	DRAWDOWN	TIME(MIN)	LEVEL	DRAWDOWN	TIME(MIN)	LEVEL	DRAWDOWN

Plot drawdown (s) and time (t) on page two, overlay type curve transparency for match, photocopy, remove type curve transparency, circle match point, enter match point parameters below for T, K, and S determinations.

THEIS METHOD AQUIFER TEST ANALYSIS

Aquifer Unit Saprolite

Radial Distance (R,ft) 10 Aquifer Thickness (b,ft) 21

Bearing from Discharge Well ______

Discharge Rate (Q,ft^3/min) .936

From Match Point (page two):

s= .86 (ft), t= 200 (min), W(u)= 4.7 , 1/u= 200

T(transmissivity, ft^2/min)=[Q/(4x3.14xs)]xW(u)

T= .407 (ft^2/min), K=T/b= 1.9×10^{-2} (ft/min)

or Tx1440= 586 (ft^2/day), Kx1440= 27.4 (ft/day)

S(storativity)= 4uxT(ft^2/min)t/(R^2)= 1.6×10^{-2}

Client: Bonnell

Project: CAP

Project # 2040.00292

Well: DW2 - T6

Date: ______

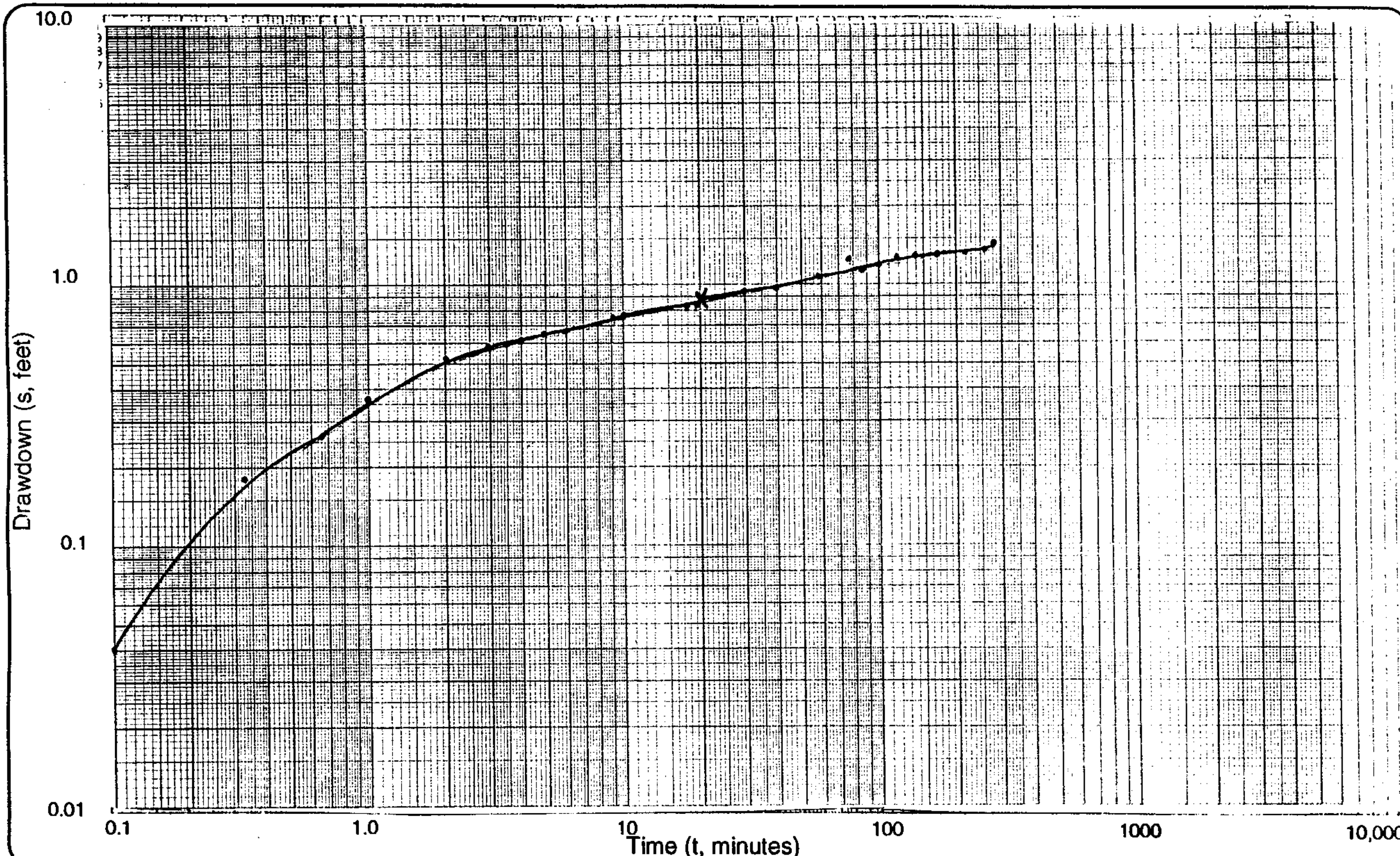
Hydrogeologist: DSB

Weather: ______

Recover/Drawdown (circle one) — Drawdown circled

EMCON

SOUTHEAST



THEIS METHOD AQUIFER TEST ANALYSIS DRAWDOWN PLOT

Client:

Project:

Project#

Location:

Well #:

Comments:

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EMCON SOUTHEAST COMPUTATION SHEET

PROJECT TITLE: Aquifer Testing PROJECT NO. 2040.007.92
DESCRIPTION: Drawdown PZ-04-PW4 SHEET 1 OF 1
PREPARED BY: DSB DATE: 2/93 CHK'D BY: DATE:

$W(u) = .55$

$\frac{1}{u} = 2$ from match pt.

$t = 3.5$

$s = .2$

$$T = \frac{Q}{4\pi s} W(u)$$

$$= .086 \frac{ft^3/min}{4\pi \cdot .2} \times .55$$

$$= .019\ ft^2/min$$

$b = 20 ft$

$$K = 9.4 \times 10^{-4}\ ft/min$$

$$= 4.8 \times 10^{-4}\ cm/sec$$

$$S = 4\ 2^{-1} \frac{.019 ft^2/min}{12.5^{12}}$$

$$= 8.5 \times 10^{-4}$$

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TIME(MIN)	LEVEL	DRAWDOWN	TIME(MIN)	LEVEL	DRAWDOWN	TIME(MIN)	LEVEL	DRAWDOWN

Plot drawdown (s) and time (t) on page two, overlay type curve transparency for match, photocopy, remove type curve transparency, circle match point, enter match point parameters below for T, K, and S determinations.

THEIS METHOD AQUIFER TEST ANALYSIS

Aquifer Unit Saprolite
Radial Distance (R,ft) 12.5 Aquifer Thickness (b,ft) 20
Bearing from Discharge Well
Discharge Rate (Q,ft^3/min) .086
From Match Point (page two):
s= .2 (ft), t= 3.5 (min), W(u)= .55, 1/u= 2
T(transmissivity, ft^2/min)=[Q/(4x3.14xs)]xW(u)
T= .019 (ft^2/min), K=T/b= 9.4×10^{-4} (ft/min)
or Tx1440= 27.4 (ft^2/day), Kx1440= 1.35 (ft/day)

S(storativity)= 4uxT(ft^2/min)t/(R^2)= 8.5×10^{-4}

Client: Bonnell
Project: CAP
Project # 2040.00292
Well: PW1- PZ4
Date:
Hydrogeologist: DB
Weather:
Recover/Drawdown (circle one) — Drawdown circled

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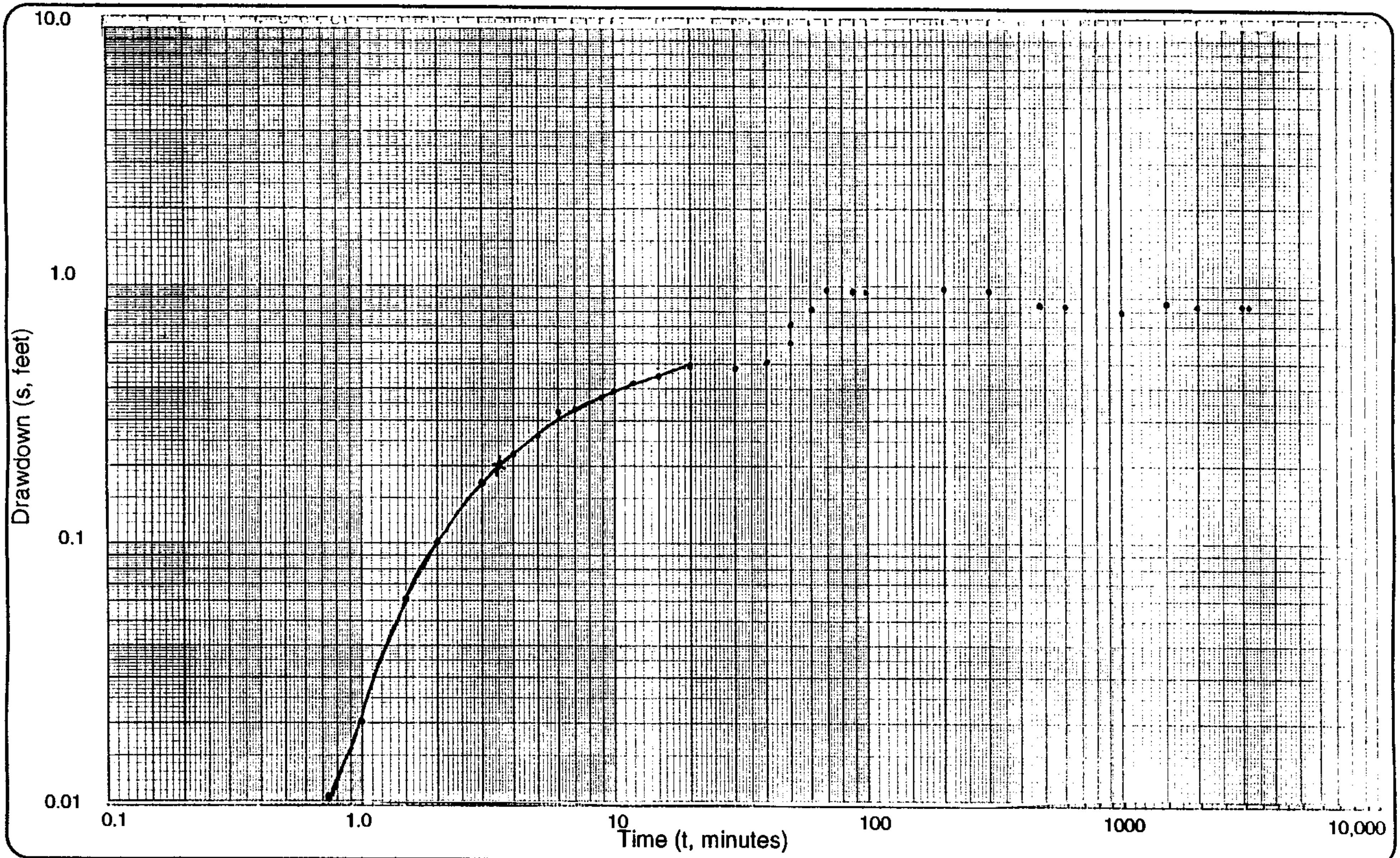

THEIS METHOD AQUIFER TEST ANALYSIS DRAWDOWN PLOT

Client:
Project:
Project#
Location:
Well #:

Comments:

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EMCON SOUTHEAST COMPUTATION SHEET

PROJECT TITLE: Aquifer Testing PROJECT NO. 2043.007.92
DESCRIPTION: MW 25 SHEET ____ OF ____
PREPARED BY: ____ DATE: ____ CHK'D BY: ____ DATE: ____

$W(u) = 2.5$

$\frac{1}{u} = 21$ from match pt.

$t = 200$

$s = .12$

$$T = \frac{Q\,W(u)}{4\pi s}$$

$$= \frac{.019\ ft^3/min\ 2.5}{4\pi\ (.12)}$$

$T = .031\ ft^2/min$ $b = 20 ft$

$K = 1.56 \times 10^{-3}\ ft/min$

$K = 8.0 \times 10^{-4}\ cm/sec$

$$S = \frac{4u\,Tt}{r^2}$$

$$= \frac{4\ 21^{-1}\ .031\ ft^2/min\ 200}{18^2}$$

$$= 3.6 \times 10^{-3}$$

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TIME(MIN)	LEVEL	DRAWDOWN	TIME(MIN)	LEVEL	DRAWDOWN	TIME(MIN)	LEVEL	DRAWDOWN

Plot drawdown (s) and time (t) on page two, overlay type curve transparency for match, photocopy, remove type curve transparency, circle match point, enter match point parameters below for T, K, and S determinations.

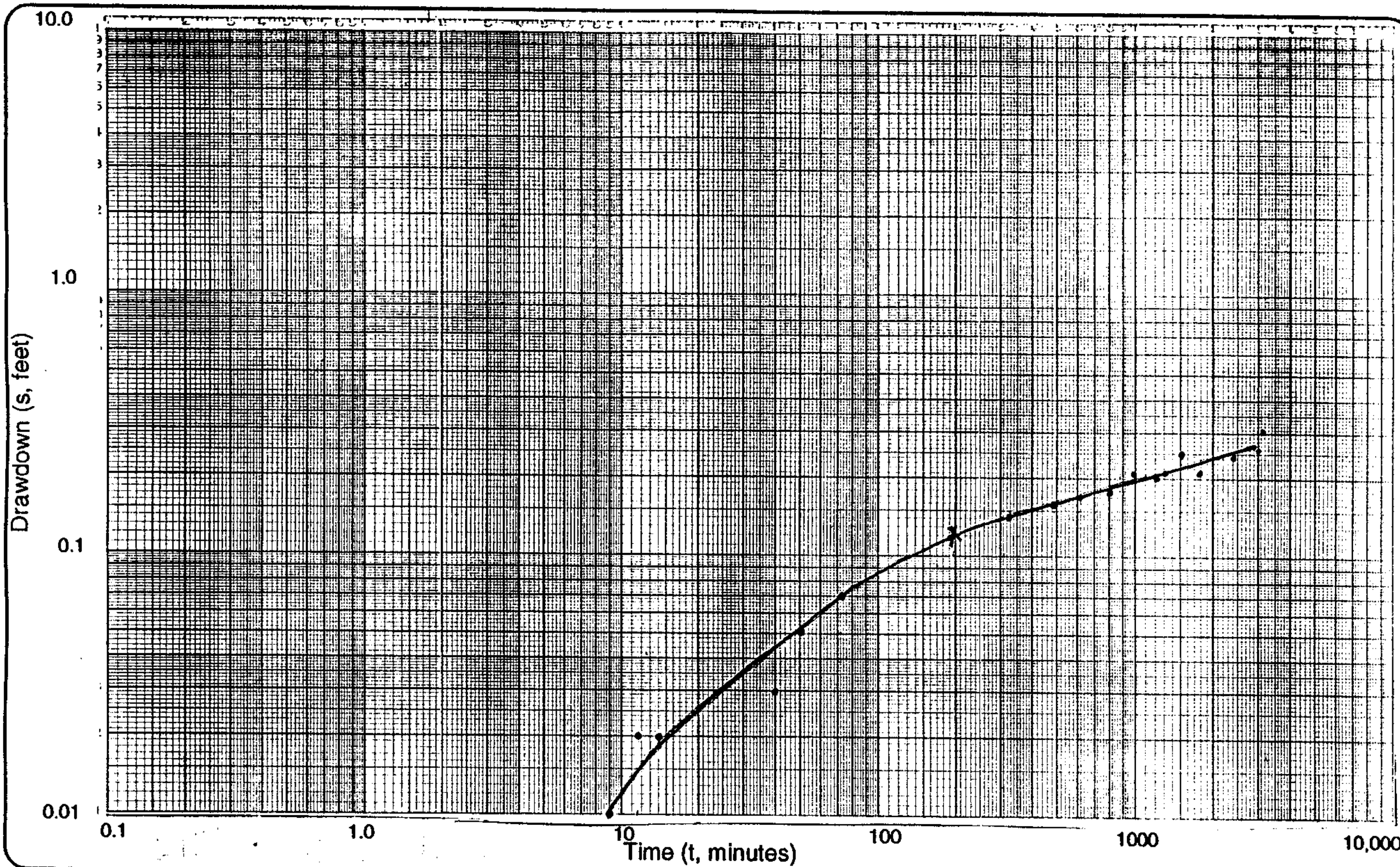
THEIS METHOD AQUIFER TEST ANALYSIS

Aquifer Unit Saprolite
Radial Distance (R,ft) 18 Aquifer Thickness (b,ft) 20
Bearing from Discharge Well ______
Discharge Rate (Q,ft^3/min) .019
From Match Point (page two):
s= .12 (ft), t= 200 (min), W(u)= 2.5, 1/u= 21
T(transmissivity, ft^2/min)=[Q/(4x3.14xs)]xW(u)
T= .031 (ft^2/min), K=T/b= 1.56×10^{-3} (ft/min)
or Tx1440= 44.6 (ft^2/day), Kx1440= 2.25 (ft/day)

S(storativity)= 4uxT(ft^2/min)t/(R^2)= 36×10^{-3}

Client: Bonnell
Project: CAP
Project # 2040.007.92
Well: PW1 - MW2S
Date: ______
Hydrogeologist: DSB
Weather: ______
Recover/Drawdown (circle one) — Drawdown circled

EMCON
SOUTHEAST



THEIS METHOD AQUIFER TEST ANALYSIS DRAWDOWN PLOT

Client:
Project:
Project#
Location:
Well #:

Comments:

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Page of two

APPENDIX B

Step-Test Data

STEP AQUIFER TEST DATA
12/11/92

Well: DW-2
Client: Bonnell
Project: Aquifer Step Test
Project #: 2040.007.92
Hydrogeologist: Joe Lewis

TIME	WL DEPTH (ft.)	FLOW RATE	COMMENTS
12:07 pm	21.82	1 gal/5:45	Frequency of Pump
12:35		1 gal/3:05	Set at approximately 60"
12:42		1 gal/5:45	Above Ground Discharge Point.
12:46	21.85	1 gal/3:05	(55 gal. Barrels on Back of
12:52	21.85	1 gal/3:03	Pickup)
12:59	21.83		
1:03	21.83		T-6 (22.0) T-5 (22.38)
1:10	21.93	1 gal/3:04	4S (20.85) 4D (22.23)
1:15		1 gal/2:13	
1:20		1 gal/1:50	
1:26	21.90	1 gal/2:02	T-6 (22.0) T-5 (22.40)
1:31	21.88		4S (20.85) 4D (22.23)
1:34	21.87	1 gal/2:05	PH = 6.1
1:44	21.87	1 gal/2:05	Spec. Conductance - 210
1:48	21.87		
1:54	21.87	1 gal/2:05	T-6 (22.02) T-5 (22.40)
2:01	21.85		4S (20.85) 4D (22.23)
2:04	21.85		
2:10	21.85	1 gal/2:04	
2:12		1 gal/1:43	
2:15	21.91	1 gal/1:31	
2:20	21.96	1 gal/1:30	
2:26	21.96		
2:30	21.96	1 gal/1:30	T-6 (21.96) T-5 (22.39)
2:37	21.96		4S (20.82) 4D (22.23)
2:41	21.97		
2:47	21.96		
2:50	21.96	1 gal/1:30	
2:58	21.96	1 gal/1:16	
3:12	21.99		
3:16	22.08	1 gal/1:00	
3:20	22.08		
3:24	22.05	1 gal/1:01	
3:34	22.40	2 gal/1:00	

STEP AQUIFER TEST DATA
12/11/92

Well: DW-2
Client: Bonnell
Project: Aquifer Step Test
Project #: 2040.007.92
Hydrogeologist: Joe Lewis

TIME	WL DEPTH (ft.)	FLOW RATE	COMMENTS
3:36 pm	22.42		
3:39	22.42		T-6 (22.30) T-5 (22.54)
3:43	22.42		4S (20.83) 4D (22.26)
3:49	22.90	4 gal/1:00	
3:52	22.93		
3:54	22.95		
3:58	23.50	6 gal/1:00	T-6 (22.35) T-5 (22.60)
4:00	23.55		4S (20.86) 4D (22.36)
4:03	23.55		
4:08	23.55		
4:11	23.85	8 gal/1:00	
4:14	23.85		
4:16	23.85		

Shut operations down at 4:20 pm. Had access to bury six 55 gallon drums and all of them are full. Pumping 8 gpm and no significant drop in water level. At this rate we will need huge water holding capabilities for test. Notified Dave Buchalter about problem.

STEP AQUIFER TEST DATA
12/14/92

Well: DW-2
Client: Bonnell
Project: Aquifer Step Test
Project #: 2040.007.92
Hydrogeologist: Joe Lewis

TIME	WL DEPTH (ft.)	FLOW RATE	COMMENTS
10:16 am	21.75		Begin test
10:26	23.05	1 gal/8 sec	T-6 (22.05) T-5 (22.43)
10:32	23.10		4S (20.85)
10:36	23.10	1 gal/8 sec	
10:40	23.10		
10:44	23.10		
10:48	23.15	1 gal/8 sec	T-6 (22.50) T-5 (22.70)
10:56	23.20		4S (20.90)
11:00	23.20		
11:11	23.20		
11:20	24.10	1 gal/8 sec	T-6 (22.67) T-5 (22.90)
11:25	24.20		4S (20.95)
11:31	24.30		
11:35	24.30	1 gal/8 sec	Pump Max. Out Freq. Wide Open
11:39	24.25		T-6 (22.77) T-5 (22.93)
11:44	24.35		4S (20.95)
11:47	24.40	1 gal/8 sec	
11:52	24.35		
11:56	24.35		
12:00 pm	24.35		T-6 (22.90) T-5 (22.97)
12:04	24.35	1 gal/8 sec	4S (20.44)
12:09	24.35		
12:11	24.35		
12:15	24.35		
12:19	24.35		T-6 (22.95) T-5(23.00)
			4S (20.92)
12:25			Shut Pump Off
12:31	21.95		End of Test
			T-6 (22.65) T-5 (22.86)
			4S (22.92)

EMCON SOUTHEAST COMPUTATION SHEET

PROJECT TITLE: Corrective Action Plan PROJECT NO. 2040.007.92
DESCRIPTION: DW1 Step Test SHEET ___ OF ___
PREPARED BY: DSB DATE: ______ CHK'D BY: ______ DATE: 2/17/93

$$\frac{\text{gallons}/\text{day}}{\text{ft.}}$$

DW 1

$$\frac{Q}{S} = \frac{T}{264 \log \left(Tt / 1.87\, r^2_w S \right) - 65.5}$$

(.001)

$$\frac{.33 \frac{gpm}{ft.}}{5.79} = \frac{T}{264 \log \left(T \times .15 \text{ days} / 1.87 \times (.33)^2 \ 1 \times 10^{-3} \right) - 65.5}$$

$$.06 = \frac{T}{264 \log (736.6T) - 65.5}$$

$$T = 65 \quad \frac{65}{(264 \log (736.6(65)) - 65.5}$$

Assume $T \cong 68$ gal / day / ft.

$T = 9.1 \text{ ft}^2/\text{day}$

$K = .30 \text{ ft}/\text{day}$

$K = 2.1 \times 10^{-4} \text{ ft}/\text{min}$

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EMCON SOUTHEAST COMPUTATION SHEET

PROJECT TITLE: Corrective Action Plans PROJECT NO. 2040.007.92
DESCRIPTION: DW 1 Q = .25 gpm Step Test SHEET ___ OF ___
PREPARED BY: ___ DATE: ___ CHK'D BY: ___ DATE: ___

$$\frac{.25}{3.48} = \frac{T}{264 \log \left(T \times .07 / 1.87 (.33)^2 \times .001 \right)}$$

$$.07 = \frac{T}{264 \log \quad 344\,T \qquad -65.5}$$

T = 75 g/day/ft.

= 10.0 ft²/day b ≅ 30 ft.

K = .33 ft/day

K = 2.3×10^{-4} ft./min

EMCON SOUTHEAST COMPUTATION SHEET

PROJECT TITLE: Corrective Action Plan PROJECT NO. 2040.007.92
DESCRIPTION: DW 1 Q = .43 Step Test SHEET ___ OF ___
PREPARED BY: ___ DATE: ___ CHK'D BY: ___ DATE: ___

At .4 gpm

$$.4 \quad \frac{Q}{S} = \frac{T}{264 \log (T .15 / 1.87 (.33)^2 \; 1 \times 10^{-3}) - 65.5}$$

$$\frac{.43}{7.55} = \frac{T}{264 \log (736.6T) - 65.5}$$

$$.057 = \frac{T}{264 \log (.2T / 1.87 (.33)^2 .001)}$$

$$.06 = \frac{T}{264 \log (982T) - 65.5}$$

$= 70$ gal/day/ft

$= 9.4$ ft^2/day

$= .31$ ft/day

$= 2.2 \times 10^{-4}$ ft/min

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STEP TEST

TIME	MINUTES	WL DEPTH	DRAWDOWN	~~TIME~~ FLOW RATE	~~MINUTES~~ FREQUENCY	~~WL DEPTH~~ REMARKS	~~DRAWDOWN~~
12:20	Ø	5.11	0.0				
12:30	PUMP	ON	—	0.75	60		
12:33	3	7.70	2.59				
12:35	5	~~7.95~~			56		
12:36	6	7.95	2.84	0.15	56		
12:39	9	7.93	~~2.86~~ 2.82	1gal/4:10	57		
12:41	11	7.98	2.87	~0.25	57		
12:45	15	8.03	2.92	~0.25	57		
12:50	20	8.03	2.92	~0.25	57		
12:56	26	8.03	2.92	1gal/4:30	57	~0.20 gpm	
13:00	30	8.04	2.93	" "	58	reset frequency to pump into top	
13:15	45	7.30	2.19	~0.15	80	of tank instead of base	
13:20	50	7.60	2.49	1gal/4min	82		
13:38	68	8.40	3.29		82		
13:41	69	8.42	3.31		82		
13:57	87	8.43	3.32	0.5/3min	82	☆	
14:04	94	—	—	0.5/2min	~~84~~ 83		
14:06	96	—	—	1.0/4min	84		
14:11	101	8.59	3.48		84	☆	
14:15	105	8.68	3.57		84		
14:20	110	8.45	3.34	1.0/5min	84		
14:22	112	—	—	1.0/2:50	86		
14:34	124	9.44	4.33	1.0/3:30	86		
14:35	125	9.50	4.39	—	86		
14:36	126	~~9.55~~			87		
14:39	129	9.55	~~4.43~~ 4.44	1.0/3min	87		
14:46	136	—	—	1.0/3:50	87		
14:49	139	9.60	4.49	—	87		
14:50	140	—	—	—	88		
14:52	142	9.88	4.77	1.0/2:35	88		
14:56	146	—	—	1.0/3min	88		
15:08	158	10.23	5.12	1.0/3:45min	88		
15:17	167	~~10.16~~ 10.21	5.10	—	88		
15:20	170	—	—	←	89		
15:25	175	—	—	1.0/3min	89		

Margin notes: @14:40 3.22 TI; TI 3.22@ 14:55; 3.27 TI @ 15:16

STEP ~~AQUIFER~~ TEST DATA

Observation (Pumped Well) (circle one)
Elevation T.O.C. N.D.
Radial Distance Ø
Bearing from Pumped Well NA
Static Water Depth: 5.11
Static Water (MSL) N.D.
Instrument: W.L. Indicator
Weather: clear cool windy
Open Interval: 2 to 31 feet
Aquifer Unit: Saprolite
Screen Type: 0.010 inch slotted 4" ID

Barometric Pressures
Start: 987 Mb End:
Well Specific Capacity:
Well Specific Productivity:

For Pumped Well
Discharge Rate:
Water Temperature:
Viscosity:
Note discharge fluctuations with time and WL depth data.

Well: DW1
Client: W.L. Bonnell Co.
Project: Aquifer Test
Project #: 2040.00
Hydrogeologist: Radzieta

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	TIME	MINUTES	WL DEPTH	DRAWDOWN	~~TIME~~ FLOWRATE	~~MINUTES~~ FREQUENCY	~~WL DEPTH~~ ~~DRAWDOWN~~ REMARKS
	15:28	178	10.49	5.38	—	89	Keeping flow rate constant is a
	15:31	181	—	—	1.0gal/3:40	89	pain in the ass! I need to
	15:35	185	10.45		—	89	rig up an oriface + manomoter
	15:38	188	—	—	1.0gal/2:40	90	guage to read flow via
	15:40	190	10.71	~~5.61~~ 5.60	—	90	inches of H_2O in manometer
	15:45	195	10.68	~~5.64~~ 5.57	1.0gal/3:15	90	
TI 3.27	15:50	200	10.74	~~5.64~~ 5.63	—	90	
	15:56	206	—	—	1.0gal/3:00	90	
	16:00	210	10.80	5.69	—	90	
	16:03	213	10.90	5.79	—	90	☆
	16:06	216	10.75	5.64	1.0gal/3:15	90	
	16:10	220	10.83	5.72	—	—	
	16:11	—	—	—	—	91	
	16:13	223	11.00	5.89	—	91	
	16:14	224	—	—	1gal/2:38	91	
	16:15	225	—	—	—	92	
	16:17	227	11.20	6.09	—	92	
	16:18	228	—	—	1gal/2:30	92	
	16:19	229	—	—	—	93	
	16:20	230	11.47	6.36	—	93	
	16:21	231	—	—	1gal/2:12	93	
	16:22	232	11.66	6.55	—	93	
	16:25	235	11.71	6.60	1gal/2:25	93	
	16:27	237	11.71	6.60	—	93	
	16:28	—	—	—	—	94	
	16:30	240	12.03	6.92	—	94	
	16:31	241	—	—	1gal/2:02	94	
	16:32	242	12.15	7.04	—	94	
TI 3.29 @16:34	16:34	244	12.29	7.14	—	94	
	16:35	245	—	—	1gal/2:16	94	
	16:38	248	12.30	7.15	—	94	
	16:40	250	12.38	7.27	—	94	
	16:41	251	12.40	7.29	—	94	
	16:43	253	—	—	1gal/2:23	94	
	16:45	255	12.35	7.24	—	94	
	16:46	256	—	—	—	95	
TI 3.325	16:48:30	258:30	12.46		—	95	
	16:49	259	—	—	1gal/2:20	95	
	16:51	261	12.49	7.38	—	95	
	17:06	276	12.66	7.55	—	95	
	17:15	285	12.66	7.55	—	95	☆ Generator died! Low oil indicator
TI [illegible]							

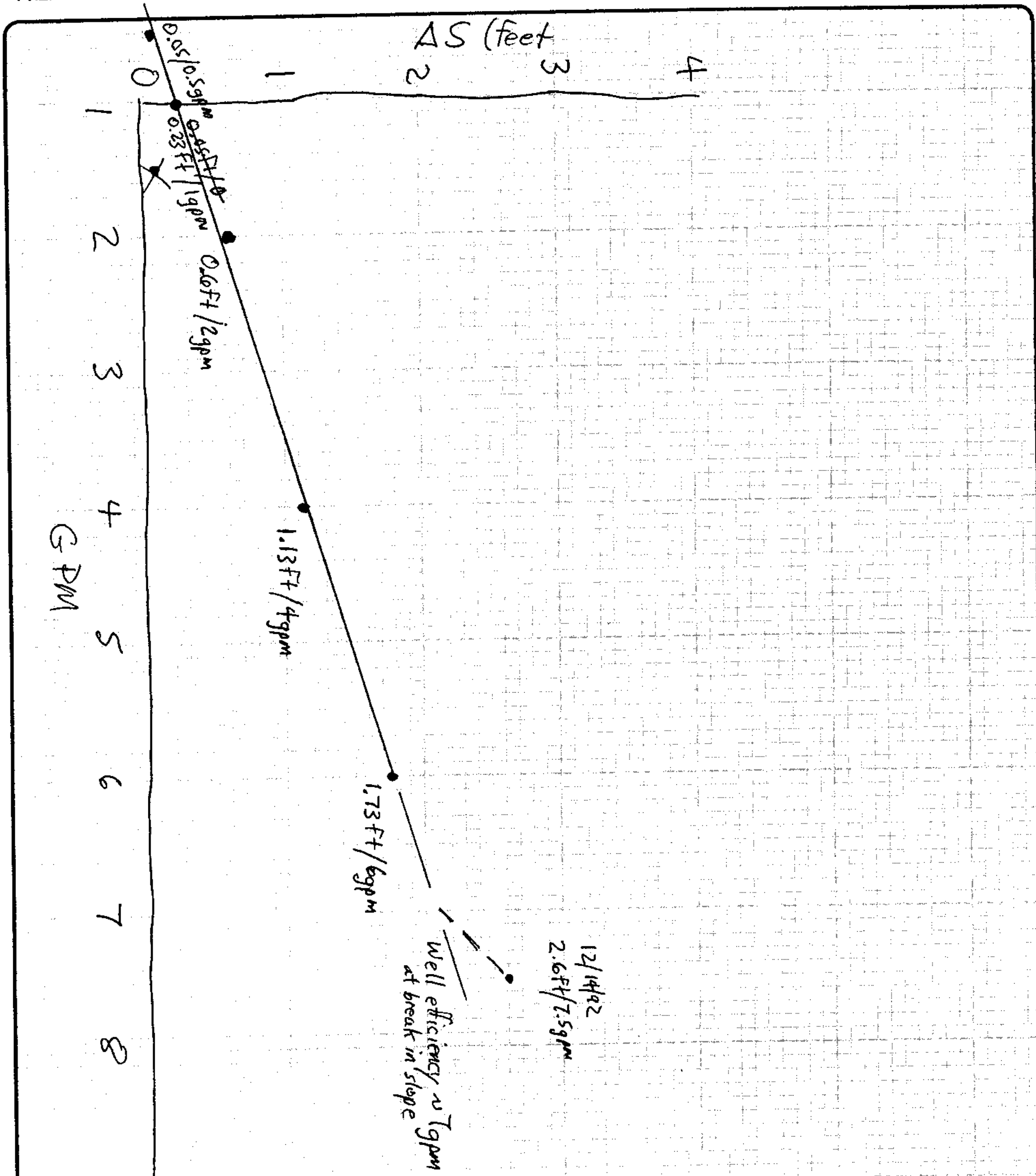
David [signature]
12-2-92

EMCON SOUTHEAST COMPUTATION SHEET

PROJECT TITLE: Step Test DW2 PROJECT NO. 2040.007.92

DESCRIPTION: Test data of 12/11/92 + 12-14-92 SHEET ___ OF ___

PREPARED BY: Radzieta DATE: ___ CHK'D BY: ___ DATE: ___



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EMCON SOUTHEAST COMPUTATION SHEET

PROJECT TITLE: Corrective Action Plan — PROJECT NO. 2040.007.92
DESCRIPTION: Step Test Analysis DW-2 — SHEET ___ OF ___
PREPARED BY: ________ DATE: ________ CHK'D BY: ________ DATE: 2/17/92

DW2

6 gal/min at 290 minutes $s = 1.73$

$$\frac{Q}{s} = \frac{T}{264 \log (Tt / 1.87 (.33)^2 \; 1\times10^{-3}} - 65.5$$

$$\frac{6}{1.73} = \frac{T}{264 \log (.2T / 1.87)}$$

$$3.47 = \frac{T}{264 \log (982.1\,T)} - 65.5$$

T = 6000 g/day/ft

T = 802 ft²/day

K = 40 ft/day $b = 20$ ft

$K = 2.8 \times 10^{-2}$ ft/min

EMCON SOUTHEAST COMPUTATION SHEET

PROJECT TITLE: Corrective Action Plan PROJECT NO. 2040.007.92
DESCRIPTION: DW2 Step Test SHEET ___ OF ___
PREPARED BY: ______ DATE: ______ CHK'D BY: ______ DATE: ______

1 gpm at 115 min

$$\frac{1}{.23} = \frac{T}{264 \log (1.08T / 1.87(.33)^2 \; 1\times10^{-3}} - 65.5$$

$$4.35 = \frac{.08T/_T \; 1.85 \times 10^{-4}}{264 \log (432\,T) - 65.5}$$

T = 7200 gal/ft.

T = 962 ft²/day

K = 48 ft/day

K = 3.3 × 10⁻²

8 gpm at 300 min s = 2.03

$$\frac{7.5}{2.60} = \frac{T}{264 \log (.21\,T / 1.85 \times 10^{-4})} - 65.5$$

$$2.88 = \frac{T}{264 \log (1135\,T)} - 65.5$$

= 4950 gal/day/ft

= 662 gal/ft²/day

= 33 ft/day

$= 2.3 \times 10^{-2}$

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APPENDIX B

Horslev Analysis

EMCON SOUTHEAST COMPUTATION SHEET

PROJECT TITLE: Hydraulic Conductivity for DW2 PROJECT NO. 2040.007.92
DESCRIPTION: Hvorslev Analyses SHEET 1 OF 1
PREPARED BY: DSB DATE: CHK'D BY: DATE:

K for DW2 using Hvorslev Eqn.

$t = 2883$ min

$\Delta S = 3.19$ ft.

$Q = 7$ gpm

$= .94\ ft^3/min$

$L = b - 2/3 \times \Delta S$

$= 20 - 2/3 \times 3.19$

$= 17.88$

$R = 0.417 ft$

$K = \frac{Q}{2\pi L dH} \ln \frac{L}{R}$

$= \frac{.94}{2 \times 3.14 \times 17.88 \times 3.19} \times \ln \frac{17.88}{.417}$

$= .00264 \times 3.76$

$= 9.87 \times 10^{-3}$ ft/min.

$= 14.2$ ft/day

$= 5 \times 10^{-3}$ cm/sec.

EMCON SOUTHEAST
435 ATLANTA TECHNOLOGY CENTER
1575 NORTHSIDE DRIVE
ATLANTA, GEORGIA 30318
(404) 355-5600

EMCON SOUTHEAST COMPUTATION SHEET

PROJECT TITLE: Hydraulic Conductivity for DW1 PROJECT NO. 2040.007.92
DESCRIPTION: Horslev Analysis SHEET 1 OF 1
PREPARED BY: DSB DATE: CHK'D BY: DATE:

K value for DW1 using Horslev Eqn. for steady state flow.

$t = 2745$ minutes

$s = 10.3$ ft.

$Q = .44$ gpm or $.0594\ ft^3/min$

$L = b - 2/3 \times \Delta s$

$= 31\ ft - 2/3 \times \Delta s$

$= 31 - 6.87$

$L = 24.13$

$$K = \frac{Q}{2\pi\, L\, dH} \times \ln \frac{L}{R}$$

$$= \frac{.0594}{2 \times 3.14 \times 24.13 \times 10.3\ ft} \times \ln \frac{24.13}{.417\ ft}$$

$K = .060038 \times \ln 57.87$

$= 1.54 \times 10^{-4}$ ft/min

$= 2.22 \times 10^{-1}$ ft/day

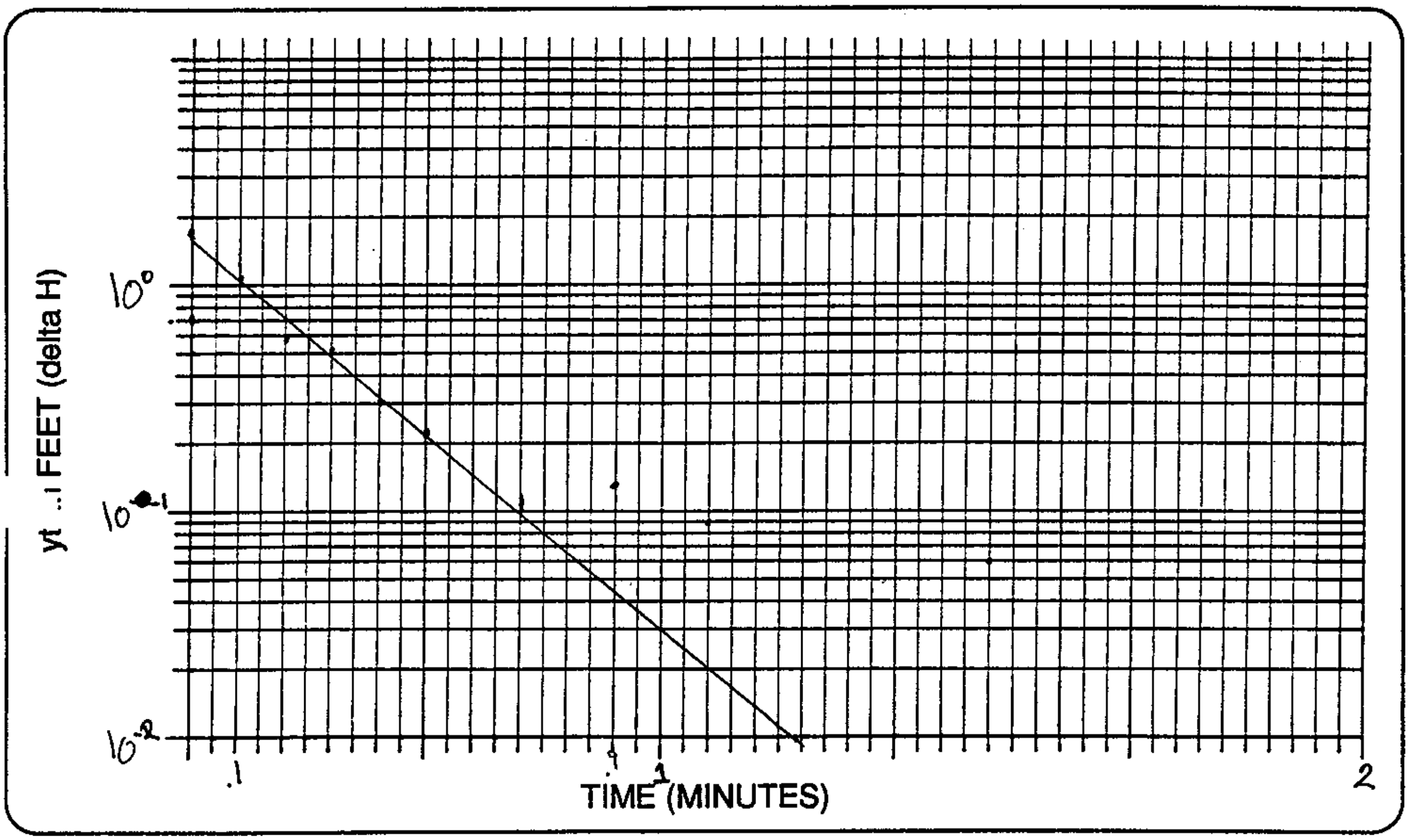
$= 7.7 \times 10^{-5}$ cm/sec.

APPENDIX B

Slug Test Data

TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)
.0 (static)		0.0	.5	.23				
0.0 (slug-in)		y0= 1.69	.6	.19				
.1		1.04	.7	.16				
.2		.58	.9	.14				
.3		.54	1.1	.09				
.4		.30						

note: If the flow test interval is not fully saturated this method is not applicable, estimate using thiem & dupuit assum.



SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

PARAMETERS:
rw= .333 ft. well radius/sandpack radius
Lw= 8.6 ft. distance from static GW to well bottom
Z= ~30 ft. distance from water table to impermeable basement/layer
Le= 8.6 ft. length of open interval/sandpack
rc= .083 ft. internal radius of well casing
D= 2.88 per min (1/t)*ln(yo/yt) for simplicity D equals 2.30/time required for H to drop one log cycle
A= 2.3
B= .35 PARAMETER VALUES FROM PAGE 2
C= 2.0

Client: Bonnell
Project: CAP
Project #: 2040.007.92
Hydrogeologist: D. Behalter
Well: 40D
Date: 12-24-92
Weather:
Slug IN OUT (circle one) [OUT circled]

EMCON
SOUTHEAST

8/92

If a partially penetrating well is tested the following equation is applicable when the test interval is fully saturated:

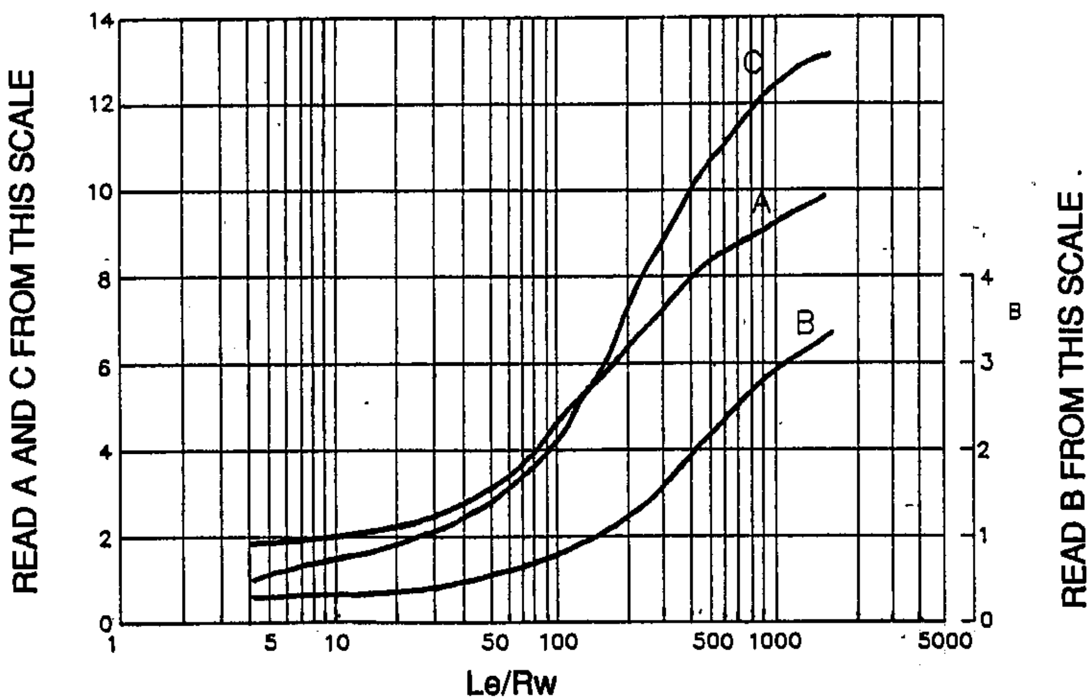
$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{A + B\ln\{(Z-Lw)/rw\}}{Le/rw} \right\}^{-1} =$$

$$\left\{ \frac{1.1}{\ln(\underline{8.6} / \underline{.333})} + \frac{\underline{2.3} + \underline{.35}\ \ln\{(\underline{30} - \underline{8.6})/\underline{.33}\}}{\underline{8.6} / \underline{.333}} \right\}^{-1} = \underline{3.4}$$

If a fully penetrating well is tested the following equation is applicable when the test interval is fully saturated:

$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{C}{Le/rw} \right\}^{-1} = \left\{ \frac{1.1}{\ln(\_\_\_\_/\_\_\_\_)} + \frac{\_\_\_\_}{\_\_\_\_/\_\_\_\_} \right\}^{-1} = \_\_\_\_$$

FLOW GEOMETRY PLOT TO DETERMINE A, B, OR C



A= 2.3

B= .35

C= 2.0

SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

K(ft/min) = (rc²DE)/(2Le)

K = (.083² 2.88 3.4)/2(8.6) = 3.9×10⁻³ ft/min

or (ft/min) times 1440 = 5.65 ft/day

or (ft/min) times 0.508 = 2.0×10⁻³ cm/s

Client:______

Project:______

Project #______

Well:______

Checked By:______

Title:______

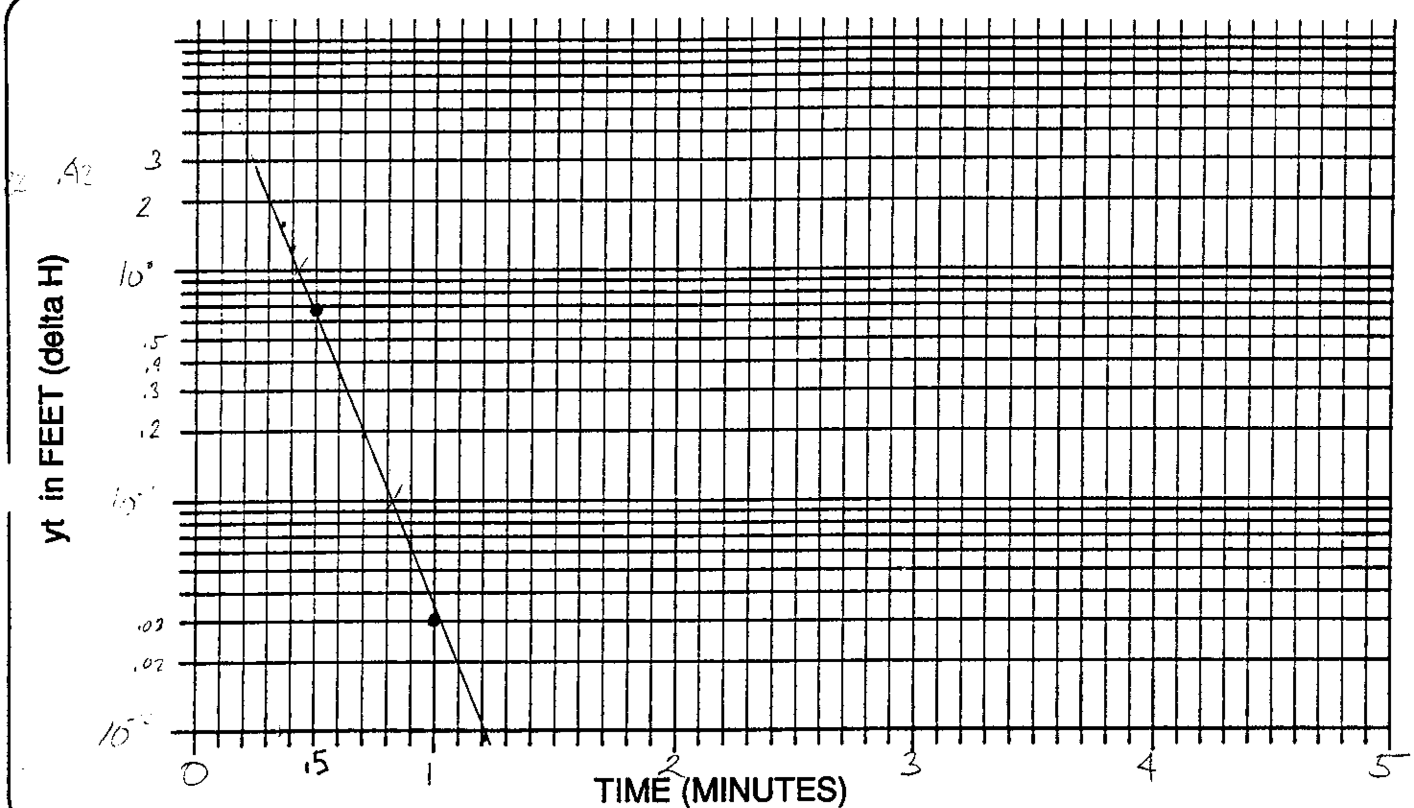
Date:______

EMCON

SOUTHEAST

TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)
0.0 (static)		0.0						
0.0 (slug-in)		y0=						
0,5		.7						
1,0		.03						

note: If the flow test interval is not fully saturated this method is not applicable, estimate using thiem & dupuit assum.



SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

PARAMETERS:

rw= .333 ft. well radius/sandpack radius

Lw= 15.5 ft. distance from static GW to well bottom

Z= ~45 ft. distance from water table to impermeable basement/layer

Le= 12 ft. length of open interval/sandpack

rc= .375 ft. internal radius of well casing

D= 2.3/.4 = 5.75 per min (1/t)*ln(yo/yt) for simplicity D equals 2.30/time required for H to drop one log cycle

A= 2.7

B= .40

C= .22

PARAMETER VALUES FROM PAGE 2

Client: Bonnell

Project: CAP

Project # 2040.002.92

Hydrogeologist: D. Buchatter

Well: 7S

Date: 12-26

Weather:

Slug IN OUT (circle one) — OUT circled

EMCON

SOUTHEAST

8/92

If a partially penetrating well is tested the following equation is applicable when the test interval is fully saturated:

$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{A + B \ln\{(Z-Lw)/rw\}}{Le/rw} \right\}^{-1} =$$

8.32 .4315 .1243 8.0

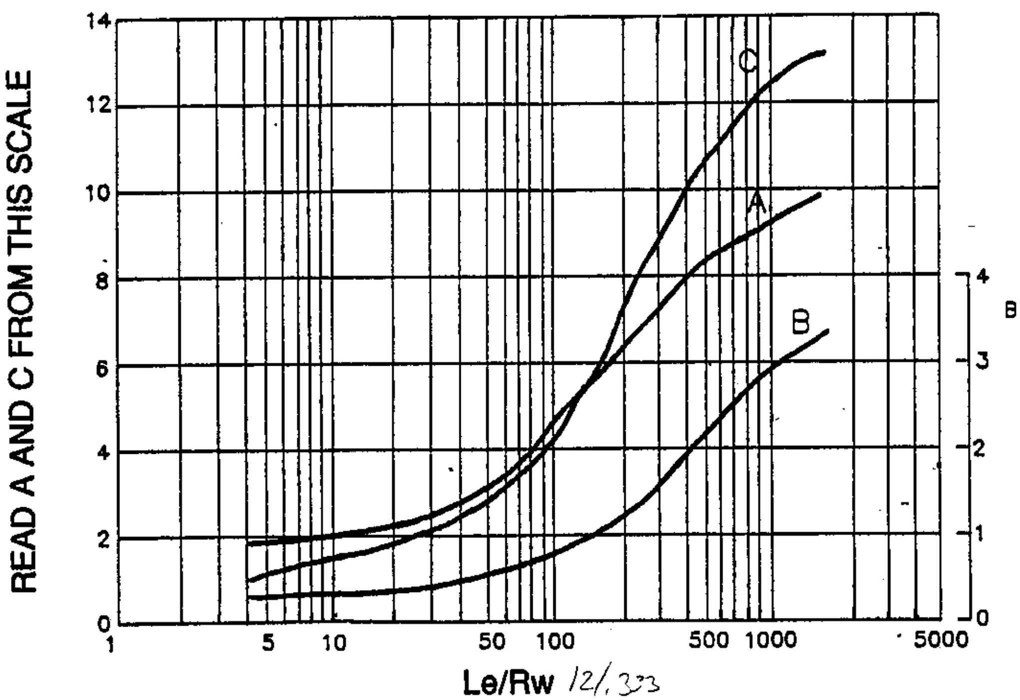
$$\left\{ \frac{1.1}{\ln(\underline{12} / \underline{.333})} + \frac{\underline{2.7} + \underline{.40} \ln\{(\underline{45} - \underline{15.5}) / \underline{.333}\}}{\underline{12} / \underline{.333}} \right\}^{-1} = \underline{8.32}$$

.30687

If a fully penetrating well is tested the following equation is applicable when the test interval is fully saturated:

$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{C}{Le/rw} \right\}^{-1} = \left\{ \frac{1.1}{\ln(\_\_\_\_/\_\_\_\_)} + \frac{\_\_\_\_}{\_\_\_\_/\_\_\_\_} \right\}^{-1} = \_\_\_\_$$

FLOW GEOMETRY PLOT TO DETERMINE A, B, OR C



A= 2.7

B= .40

C= 2.2

SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

$K(\text{ft/min}) = (rc^2 DE)/(2Le)$

USing Rc = .195
K = 7.6 × 10^-2

K = (.083² (.195) 5.75 8.32)/2(12) = 1.37×10⁻² ft/min

or (ft/min) times 1440 = 19.77 ft/day

or (ft/min) times 0.508 = 6.6×10⁻³ cm/s

$r_c = [(1-n) r_c^2 + n r_w^2]^{1/2}$

$= [(1-.3) .083^2 + .3 (.333)^2]^{1/2}$

.195 ← = rc for equivalent radius

Client: Bonnell

Project: CAP

Project #: 2040.007.92

Well: 7S

Checked By:

Title:

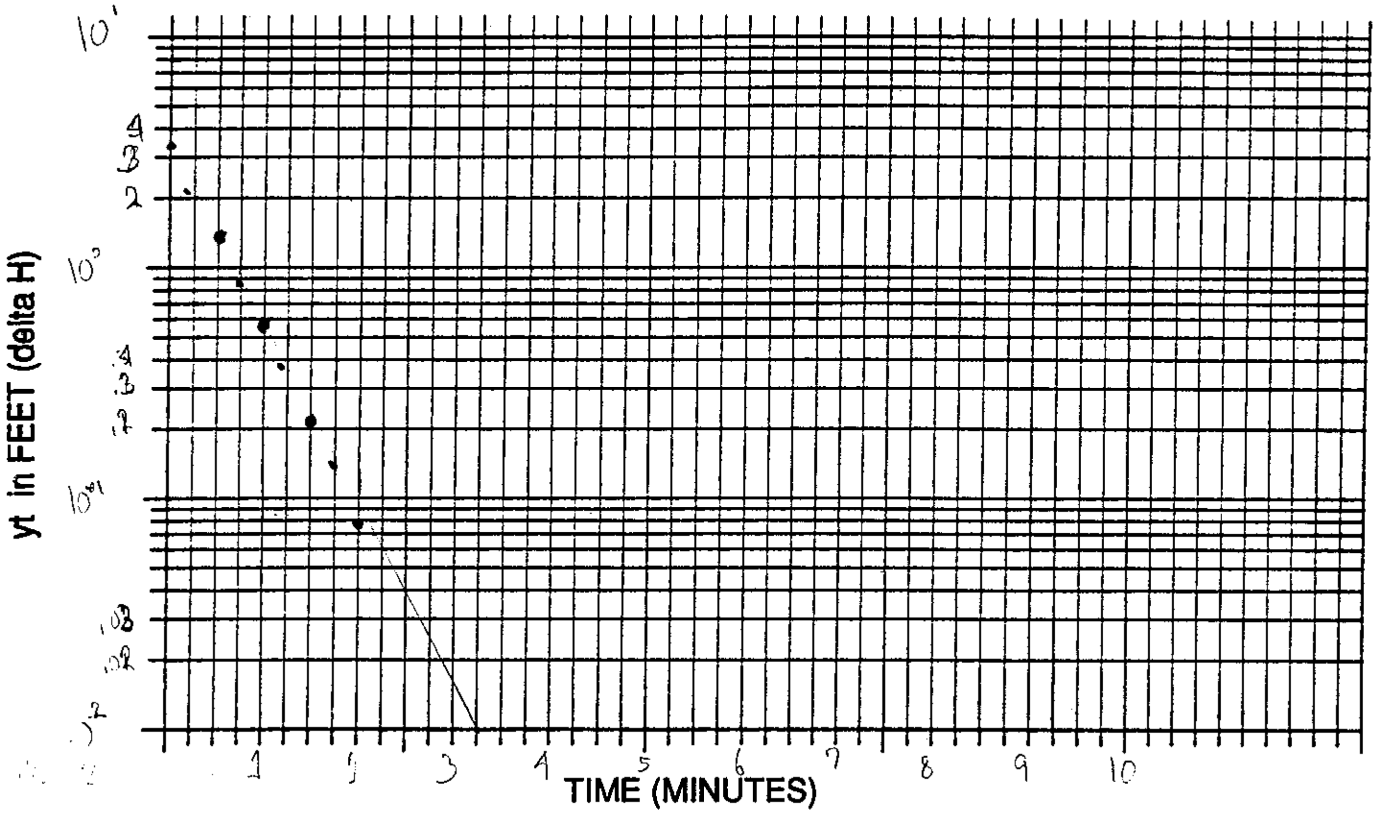
Date:

EMCON

SOUTHEAST

TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)
.0 (static)		0.0						
0.0 (slug-in)		y0=						
0.5		1.3						
1.0		.55						
1.5		.21						
2.0		.08						

note: If the flow test interval is not fully saturated this method is not applicable, estimate using thiem & dupuit assum.



SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

PARAMETERS:

rw= .333 ft. well radius/sandpack radius

Lw= [illegible] ft. distance from static GW to well bottom

Z= [illegible] ft. distance from water table to impermeable basement/layer

Le= 12 ft. length of open interval/sandpack

rc= .083 ft. internal radius of well casing

D= [illegible] per min (1/t)*ln(yo/yt) for simplicity D equals 2.30/time required for H to drop one log cycle

A= 2.7

B= .40

C= 2.2

PARAMETER VALUES FROM PAGE 2

Client: Bonnell

Project: CAP

Project #: 2040.007.92

Hydrogeologist: D. Behnke

Well: 26D

Date: 12-24-92

Weather: Sunny

Slug IN OUT (circle one) — OUT circled

EMCON

SOUTHEAST

8/92

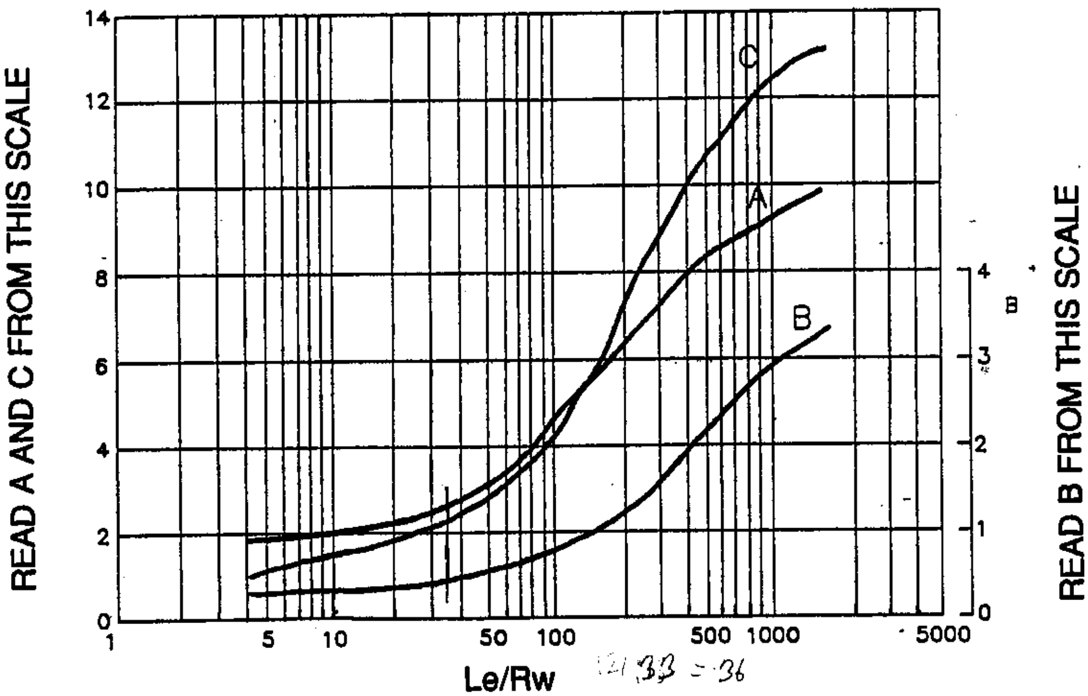
If a partially penetrating well is tested the following equation is applicable when the test interval is fully saturated:

$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{A + B \ln((Z-Lw)/rw)}{Le/rw} \right\}^{-1} =$$

$$\left\{ \frac{1.1}{\ln(\_\_\_\_/\_\_\_\_)} + \frac{\_\_\_\_ + \_\_\_\_ \ln\{(\_\_\_\_ - \_\_\_\_)/\_\_\_\_\}}{\_\_\_\_/\_\_\_\_} \right\}^{-1} = \_\_\_\_$$

If a fully penetrating well is tested the following equation is applicable when the test interval is fully saturated:

$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{C}{Le/rw} \right\}^{-1} = \left\{ \frac{1.1}{\ln(28.75\,/\,.33)} + \frac{2.2}{12\,/\,.33} \right\}^{-1} = 3.26$$



A= 2.7
B= .40
C= 2.2

12/.33 = 36

SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

$K(ft/min) = (rc^2DE)/(2Le)$

K = ((.083)² 1.84 3.26)/2(12) = 1.7×10^{-3} ft/min

or (ft/min) times 1440 = 2.48 ft/day

or (ft/min) times 0.508 = 8.7×10^{-4} cm/s

Client: Bonnell

Project: CAP

Project #: 2040.007.92

Well: 26D

Checked By:

Title:

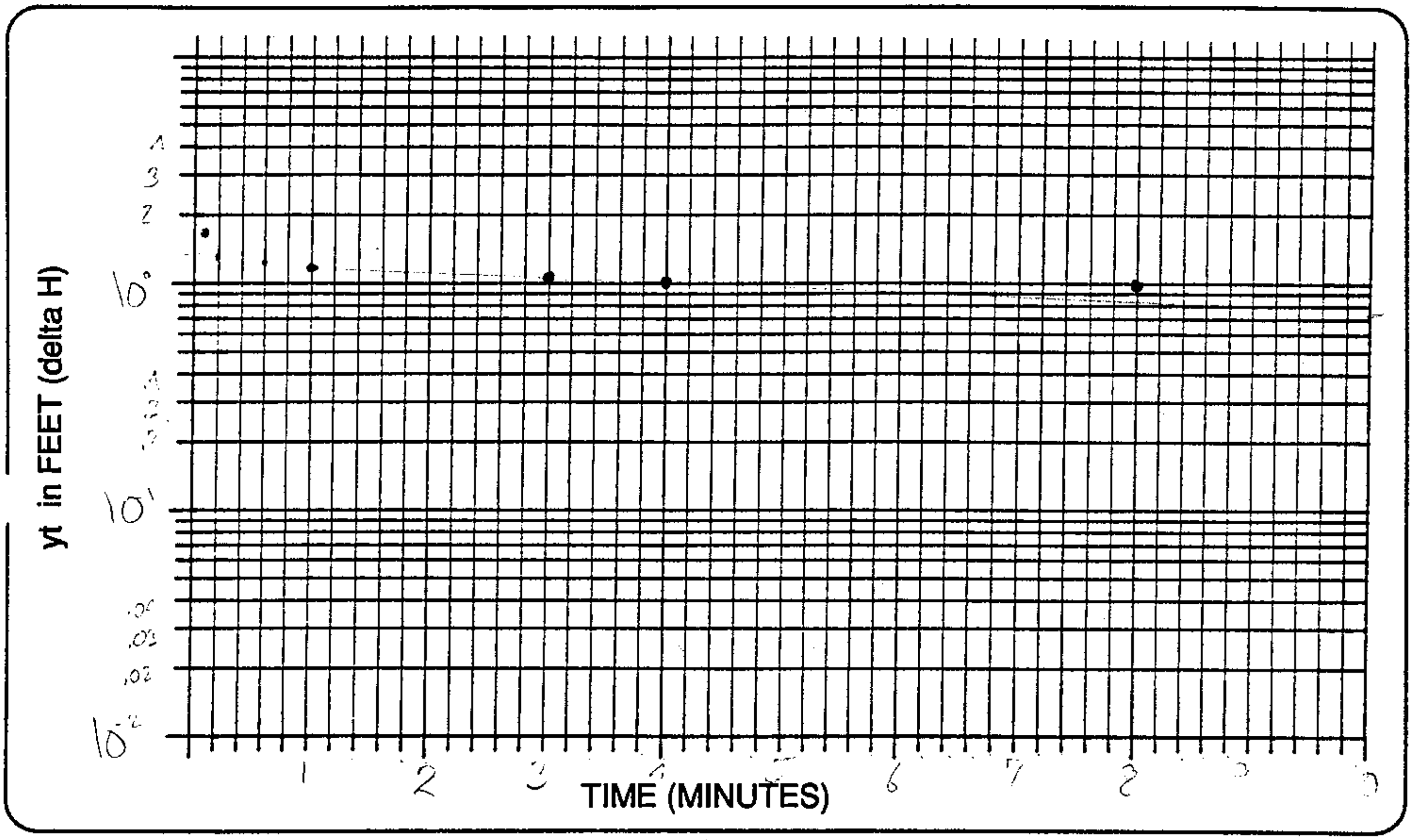
Date:

EMCON

SOUTHEAST

TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)
0.0 (static)		0.0						
0.0 (slug-in)		y0=						
1.0		1.1						
3.0		1.05						
4		1.0						
8		0.97						

note: if the flow test interval is not fully saturated this method is not applicable, estimate using thiem & dupuit assum.



SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

PARAMETERS:

rw= .333 ft. well radius/sandpack radius

Lw= 5.40 ft. distance from static GW to well bottom

Z= 29. ft. distance from water table to impermeable basement/layer

Le= 5.4 ft. length of open interval/sandpack

rc= .023 ft. internal radius of well casing

D= [illegible] per min (1/t)*ln(yo/yt) for simplicity D equals 2.30/time required for H to drop one log cycle

A= 2.2

B= .4

C= 1.5

PARAMETER VALUES FROM PAGE 2

Client: Bonnell

Project: CAP

Project # 2040.007.92

Hydrogeologist: D. Buchholtz

Well: 26S

Date: 12-24-92

Weather:

Slug IN OUT (circle one) — OUT circled

EMCON

SOUTHEAST

8/92

If a partially penetrating well is tested the following equation is applicable when the test interval is fully saturated:

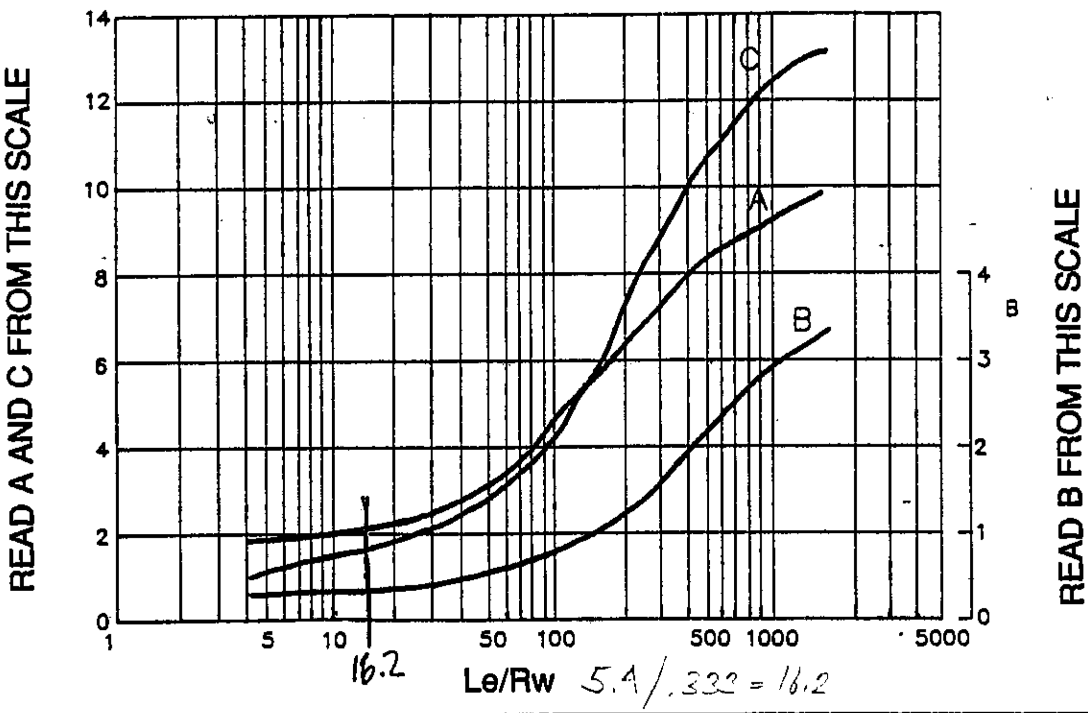
$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{A + B\ln\{(Z-Lw)/rw\}}{Le/rw} \right\}^{-1} =$$

$$\left\{ \frac{1.1}{\ln(5.4\ /\ .333)}^{.394} + \frac{2.2 + .4\ \ln\{(29 - 5.4)/.333\}}{5.4\ /\ .333} \right\}^{-1} = .1.57$$

If a fully penetrating well is tested the following equation is applicable when the test interval is fully saturated:

$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{C}{Le/rw} \right\}^{-1} = \left\{ \frac{1.1}{\ln(\_\_\_/\_\_\_)} + \frac{\_\_\_}{\_\_\_/\_\_\_} \right\}^{-1} = \_\_\_$$

FLOW GEOMETRY PLOT TO DETERMINE A, B, OR C



A= 2.2
B= .4
C= 1.5

SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

$K(ft/min) = (rc^2DE)/(2Le)$

K = (.083² .058 1.57)/2(5.4) = 5.8×10⁻⁵ ft/min

or (ft/min) times 1440 = .083 ft/day

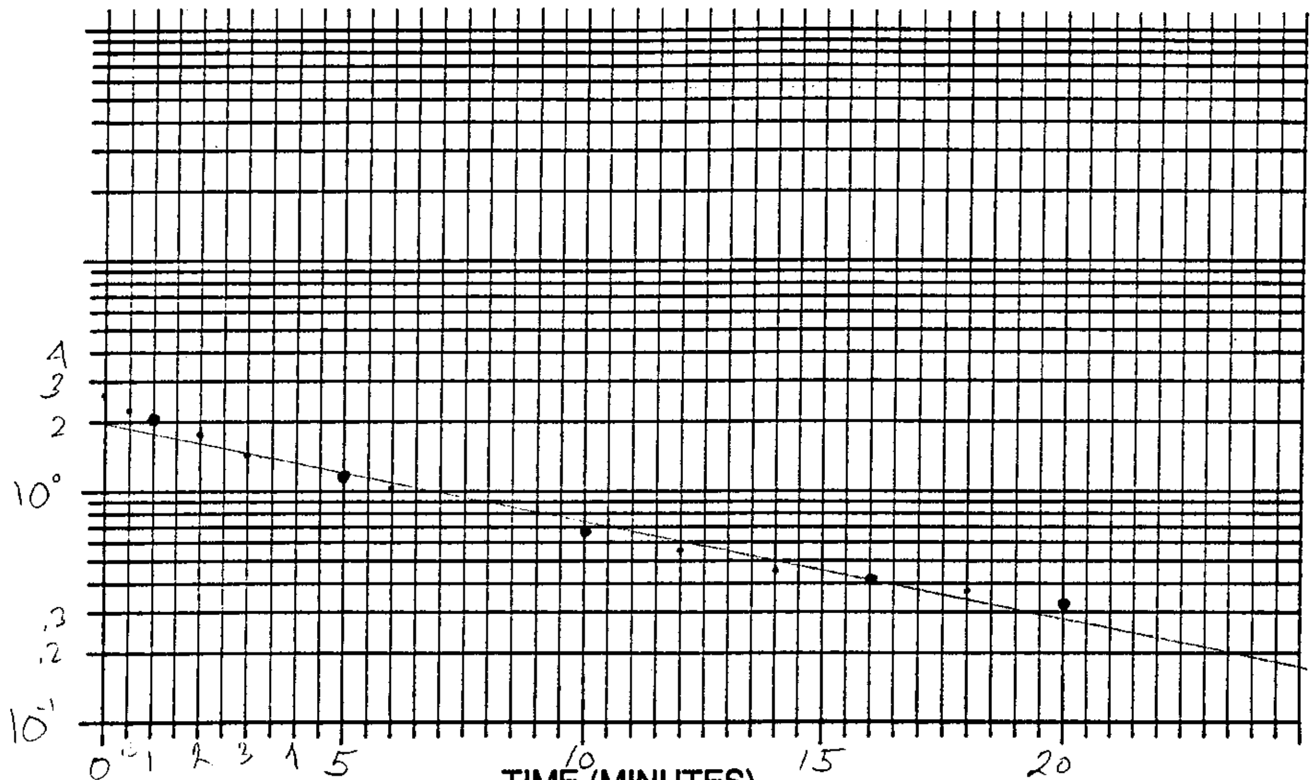
or (ft/min) times 0.508 = 2.6×10⁻⁵ cm/s

Client: Bonnell
Project: CAP
Project #: 2040.007.92
Well: 26S
Checked By:
Title:
Date:

EMCON
SOUTHEAST

TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)
0.0 (static)		0.0						
0.0 (slug-in)		y0=	20		0.31			
1.0		2						
5.0		1.2						
10.0		0.7						
16 ~~15.0~~		0.41						

note: If the flow test interval is not fully saturated this method is not applicable, estimate using thiem & dupuit assum.



SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

PARAMETERS:

rw= .333 ft. well radius/sandpack radius

Lw= 25 ft. distance from static GW to well bottom

Z= 25 ft. distance from water table to impermeable basement/layer

Le= 12 ft. length of open interval/sandpack

rc= .083 ft. internal radius of well casing

D= 2.3 / 23.5 = .098 per min (1/t)*ln(yo/yt) for simplicity D equals 2.30/time required for H to drop one log cycle

A= 2.7

B= .40

C= 2.2

PARAMETER VALUES FROM PAGE 2

Client: Bennell
Project: CAP
Project # 2040.007.92
Hydrogeologist: P. Buchalter
Well: 32D
Date: 12-26-92
Weather:
Slug IN (OUT) (circle one)

EMCON
SOUTHEAST

8/92

If a partially penetrating well is tested the following equation is applicable when the test interval is fully saturated:

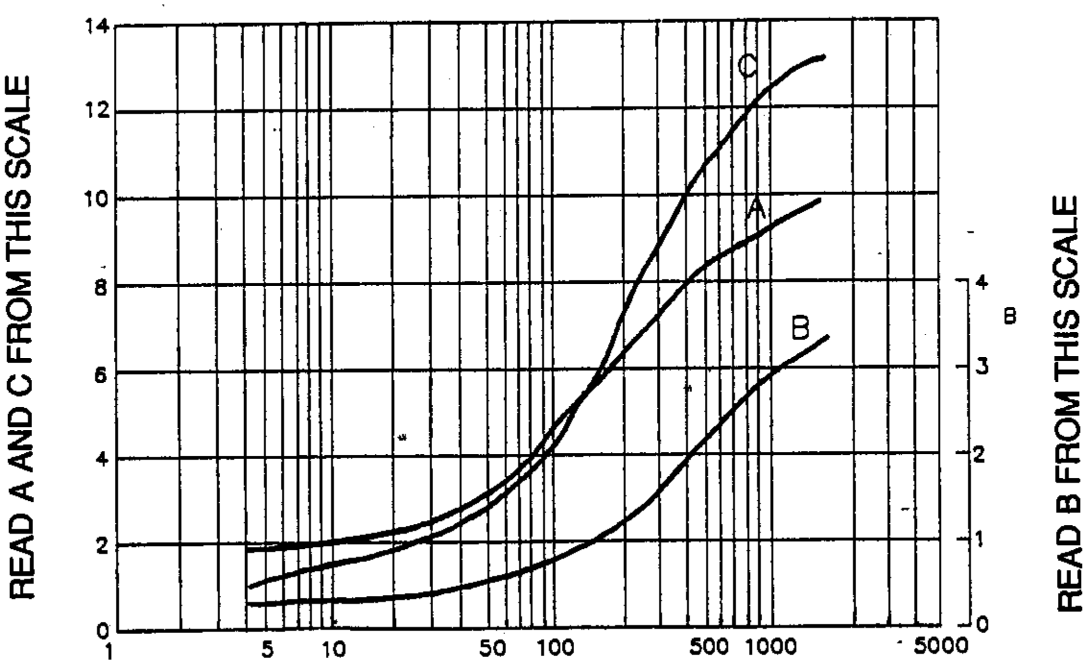
$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{A + B \ln\{(Z-Lw)/rw\}}{Le/rw} \right\}^{-1} =$$

$$\left\{ \frac{1.1}{\ln(\_\_\_\_/\_\_\_\_)} + \frac{\_\_\_\_ + \_\_\_\_ \ln\{(\_\_\_\_ - \_\_\_\_)/\_\_\_\_\}}{\_\_\_\_/\_\_\_\_} \right\}^{-1} = \_\_\_\_$$

If a fully penetrating well is tested the following equation is applicable when the test interval is fully saturated:

$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{C}{Le/rw} \right\}^{-1} = \left\{ \frac{1.1}{\ln(25 / .33)} + \frac{2.2}{12 / .333} \right\}^{-1} = 3.19$$

FLOW GEOMETRY PLOT TO DETERMINE A, B, OR C



Le/Rw 12/.333

A= 2.7

B= .40

C= 2.2

SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

$K(ft/min) = (rc^2DE)/(2Le)$

K = (.083² .083 3.19)/2(12) = 8.9×10^{-5} ft/min

or (ft/min) times 1440 = .13 ft/day

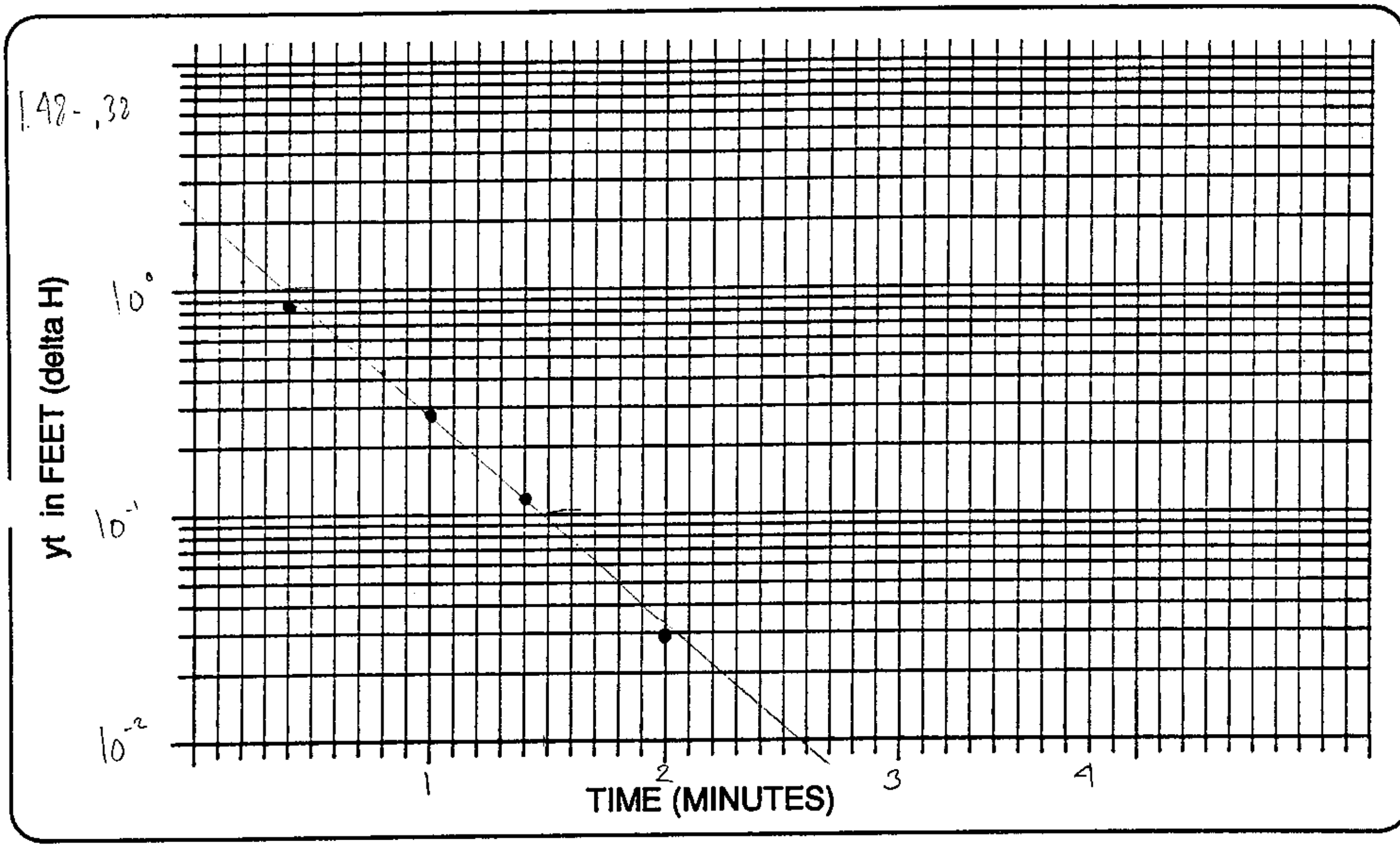
or (ft/min) times 0.508 = 4.5×10^{-5} cm/s

Client: Bonnell
Project:
Project #
Well: 32D
Checked By:
Title:
Date:

EMCON
SOUTHEAST

TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)
.0 (static)		0.0						
0.0 (slug-in)		y0=						
0.4		0.85						
1.0		0.28						
1.4		0.12						
2.0		0.03						

note: If the flow test interval is not fully saturated this method is not applicable, estimate using thiem & dupuit assum.



SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

PARAMETERS:

rw= .333 ft. well radius/sandpack radius

Lw= 9.36 ft. distance from static GW to well bottom

Z= ~30 ft. distance from water table to impermeable basement/layer

Le= 9.36 ft. length of open interval/sandpack

rc= .083 ft. internal radius of well casing

D= 2.3/1.1=2.1 per min (1/t)*ln(yo/yt) for simplicity D equals 2.30/time required for H to drop one log cycle

A= 2.9

B= A ~~2.0~~

C= 2.0

PARAMETER VALUES FROM PAGE 2

Client: Bonnell

Project: CAP

Project # 2040.007.92

Hydrogeologist: P. Budatter

Well: 4D

Date: 12-24-92

Weather:

Slug IN OUT (circled) (circle one)

EMCON

SOUTHEAST

8/92

If a partially penetrating well is tested the following equation is applicable when the test interval is fully saturated:

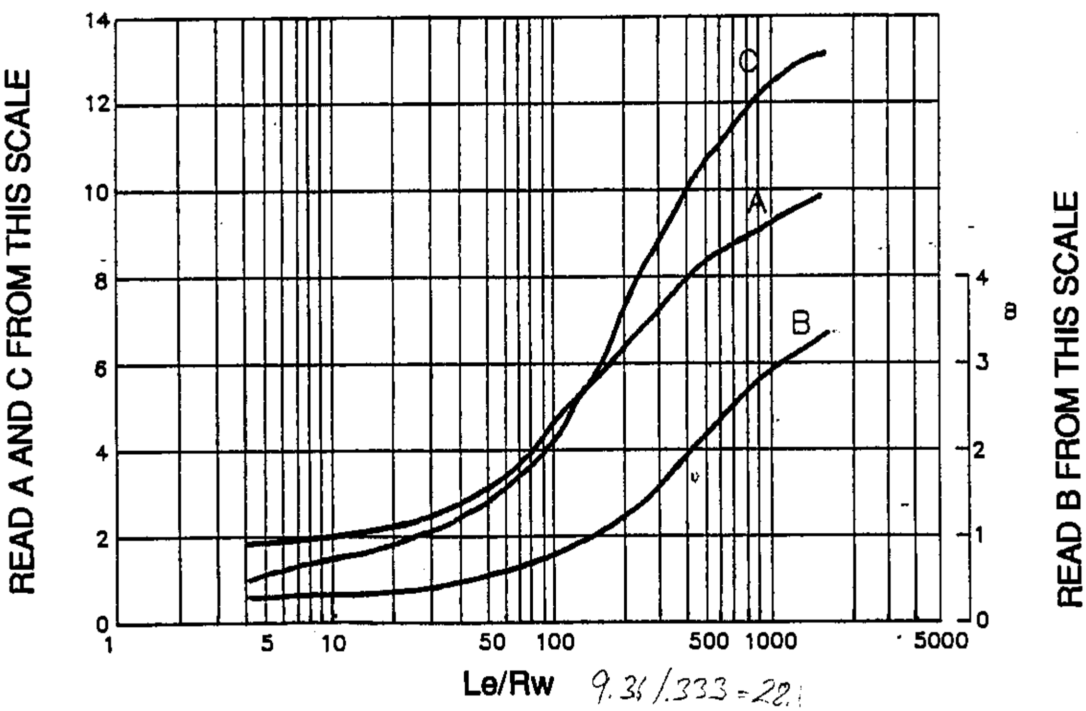
$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{A + B \ln((Z-Lw)/rw)}{Le/rw} \right\}^{-1} =$$

$$\left\{ \frac{1.1}{\ln(\underline{9.36} / \underline{.333})} + \frac{\underline{2.4} + \underline{.4} \ln((\underline{30} - \underline{9.36})/\underline{.333})}{\underline{9.36} / \underline{.333}} \right\}^{-1} = \underline{2.11}$$

.33 .144

If a fully penetrating well is tested the following equation is applicable when the test interval is fully saturated:

$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{C}{Le/rw} \right\}^{-1} = \left\{ \frac{1.1}{\ln(\_\_\_/\_\_\_)} + \frac{\_\_\_}{\_\_\_/\_\_\_} \right\}^{-1} = \_\_\_$$



A= 2.4

B= .4

C= 2.0

SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

K(ft/min) = $(rc^2 DE)/(2Le)$

K = (.083² 2.1 2.11)/2(9.36) = 1.63×10^{-3} ft/min

or (ft/min) times 1440 = 2.35 ft/day

or (ft/min) times 0.508 = 8.28×10^{-4} cm/s

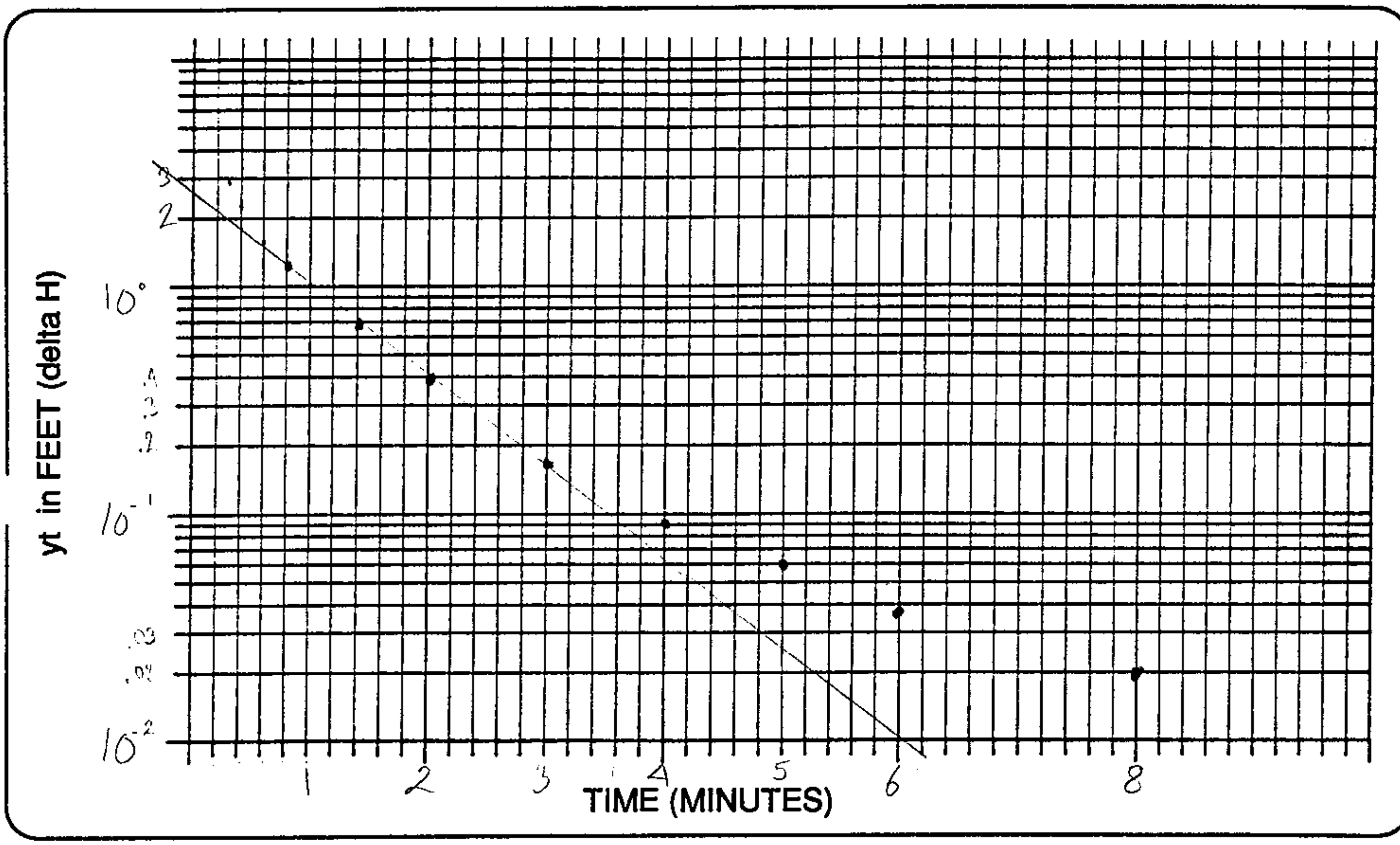
Client: Bonnell
Project: CAP
Project # 2040.002.92
Well: 4D
Checked By:
Title:
Date:

EMCON

SOUTHEAST

TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)
0.0 (static)		0.0	5		.06			
0.0 (slug-in)		y0=	6		.038			
1		1.3	8		.020			
2		.4						
3		.17						
4		.09						

note: If the flow test interval is not fully saturated this method is not applicable, estimate using thiem & dupuit assum.



SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

PARAMETERS:

rw= .333 ft. well radius/sandpack radius

Lw= 11.9 ft. distance from static GW to well bottom

Z= 40 ft. distance from water table to impermeable basement/layer

Le= 11.9 ft. length of open interval/sandpack

rc= .083 ft. internal radius of well casing

D= 2.3 / 2.6 = .88 per min (1/t)*ln(yo/yt) for simplicity D equals 2.30/time required for H to drop one log cycle

A= 2.7

B= .46

C= 2.2

PARAMETER VALUES FROM PAGE 2

Client: Bonnell

Project: CAP

Project # 2090.007.92

Hydrogeologist: P. Budalter

Well: OS3S

Date: 12-26-92

Weather:

Slug IN OUT (circle one)

EMCON

SOUTHEAST

8/92

If a partially penetrating well is tested the following equation is applicable when the test interval is fully saturated:

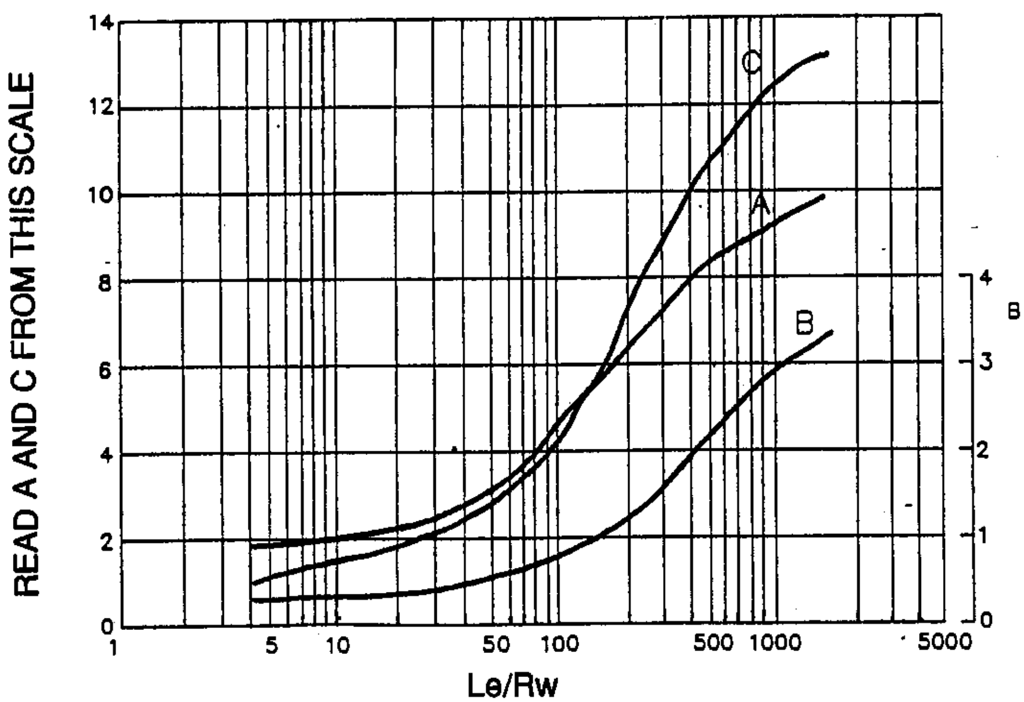
$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{A + B \ln\{(Z-Lw)/rw\}}{Le/rw} \right\}^{-1} =$$

$$\left\{ \frac{1.1}{\ln(11.9 / .333)} + \frac{2.7 + .4 \ln\{(40 - 11.9)/.333\}}{11.9 / .333} \right\}^{-1} = 2.31$$

If a fully penetrating well is tested the following equation is applicable when the test interval is fully saturated:

$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{C}{Le/rw} \right\}^{-1} = \left\{ \frac{1.1}{\ln(\_\_\_/\_\_\_)} + \frac{\_\_\_}{\_\_\_/\_\_\_} \right\}^{-1} = \_\_\_$$

FLOW GEOMETRY PLOT TO DETERMINE A, B, OR C



A= 2.7

B= .40

C= 2.2

SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

$K(ft/min) = (rc^2DE)/(2Le)$

K = (.083² .82 2.31)/2(11.9) = 5.9e-4 ft/min

or (ft/min) times 1440 = .85 ft/day

or (ft/min) times 0.508 = 2.9e-4 cm/s

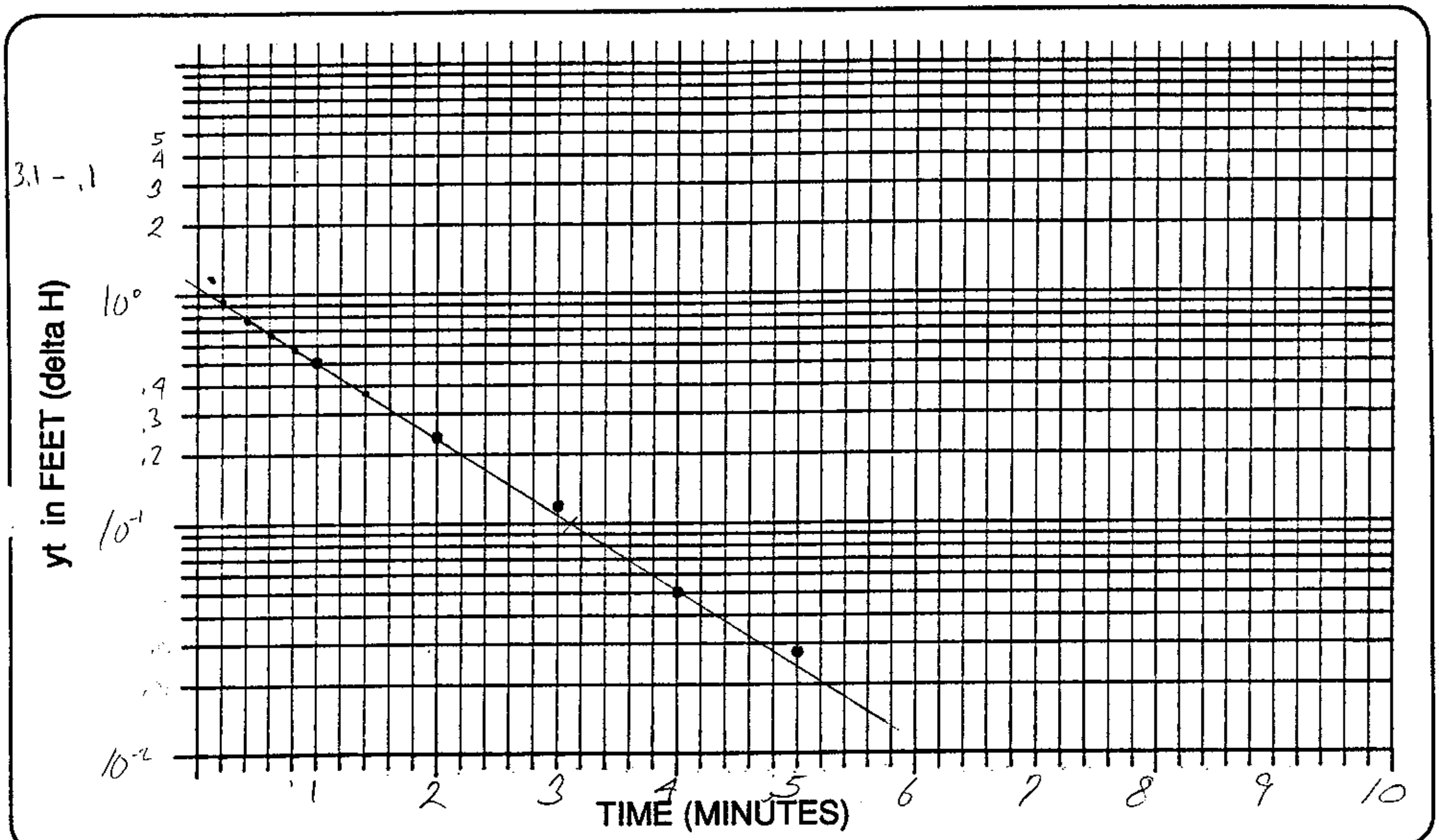
Client: Bonnell
Project: CAP
Project # 2040.007.92
Well: OS3S
Checked By:
Title:
Date:

EMCON

SOUTHEAST

TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)
.0 (static)		0.0						
0.0 (slug-in)		y0=	5	0.028				
1.0		0.5						
2.0		0.23						
3.0		0.12						
4.0		0.05						

note: If the flow test interval is not fully saturated this method is not applicable, estimate using thiem & dupuit assum.



SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

PARAMETERS:

rw= .333 ft. well radius/sandpack radius

Lw= 39.8 ft. distance from static GW to well bottom

Z= 39.8 ft. distance from water table to impermeable basement/layer

Le= 12 ft. length of open interval/sandpack

rc= .083 ft. internal radius of well casing

D= 2.3/3=.77 per min (1/t)*ln(yo/yt) for simplicity D equals 2.30/time required for H to drop one log cycle

A= 2.7

B= .40

C= 2.2

PARAMETER VALUES FROM PAGE 2

Client: Bonnell

Project: CAP

Project # 2040.007.92

Hydrogeologist: D. Buchalter

Well: 7D

Date: 12/26/92

Weather:

Slug IN OUT (circle one)

EMCON

SOUTHEAST

8/92

If a partially penetrating well is tested the following equation is applicable when the test interval is fully saturated:

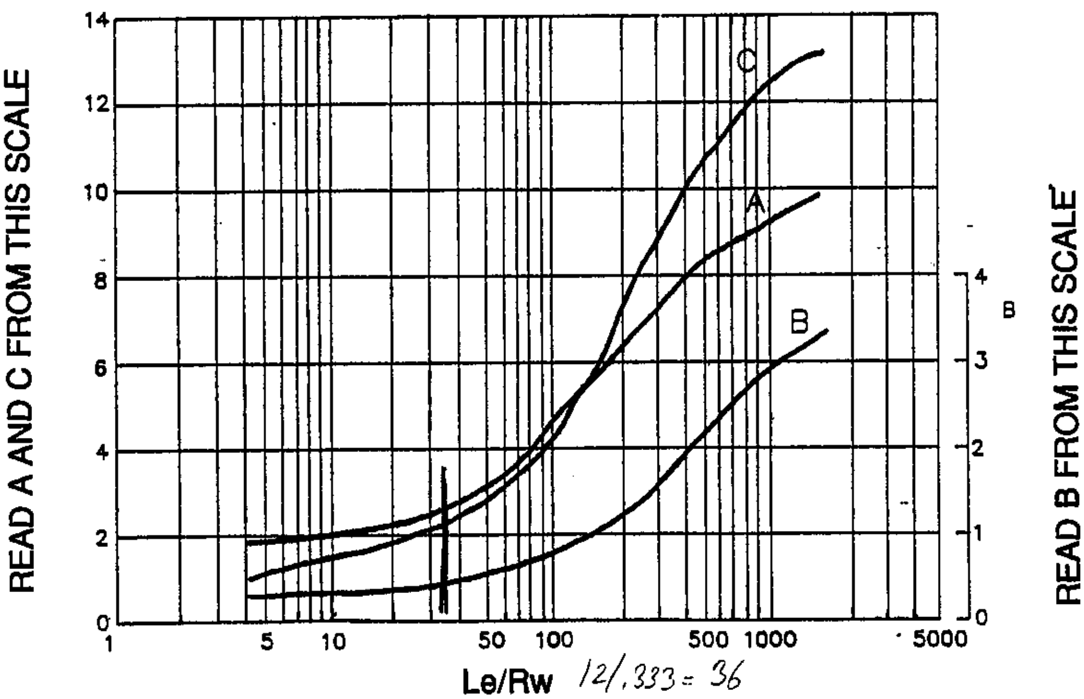
$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{A + B\ln\{(Z-Lw)/rw\}}{Le/rw} \right\}^{-1} =$$

$$\left\{ \frac{1.1}{\ln(\_\_\_\_/\_\_\_\_)} + \frac{\_\_\_\_ + \_\_\_\_\ln\{(\_\_\_\_ - \_\_\_\_)/\_\_\_\_\}}{\_\_\_\_/\_\_\_\_} \right\}^{-1} = \_\_\_\_$$

If a fully penetrating well is tested the following equation is applicable when the test interval is fully saturated:

$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{C}{Le/rw} \right\}^{-1} = \left\{ \frac{1.1}{\ln(39.8/.333)} + \frac{2.2}{12/.333} \right\}^{-1} = 3.43$$

FLOW GEOMETRY PLOT TO DETERMINE A, B, OR C



A= 2.7
B= .40
C= 2.2

SLUG TEST, BOUWER & RICE (Groundwater, May-June, 1989)

$K(\text{ft/min}) = (rc^2 DE)/(2Le)$

$K = (.083^2 \;\; .77 \;\; 3.43)/2(12) = 7.58\times10^{-4}$ ft/min

or (ft/min) times 1440 = 1.09 ft/day

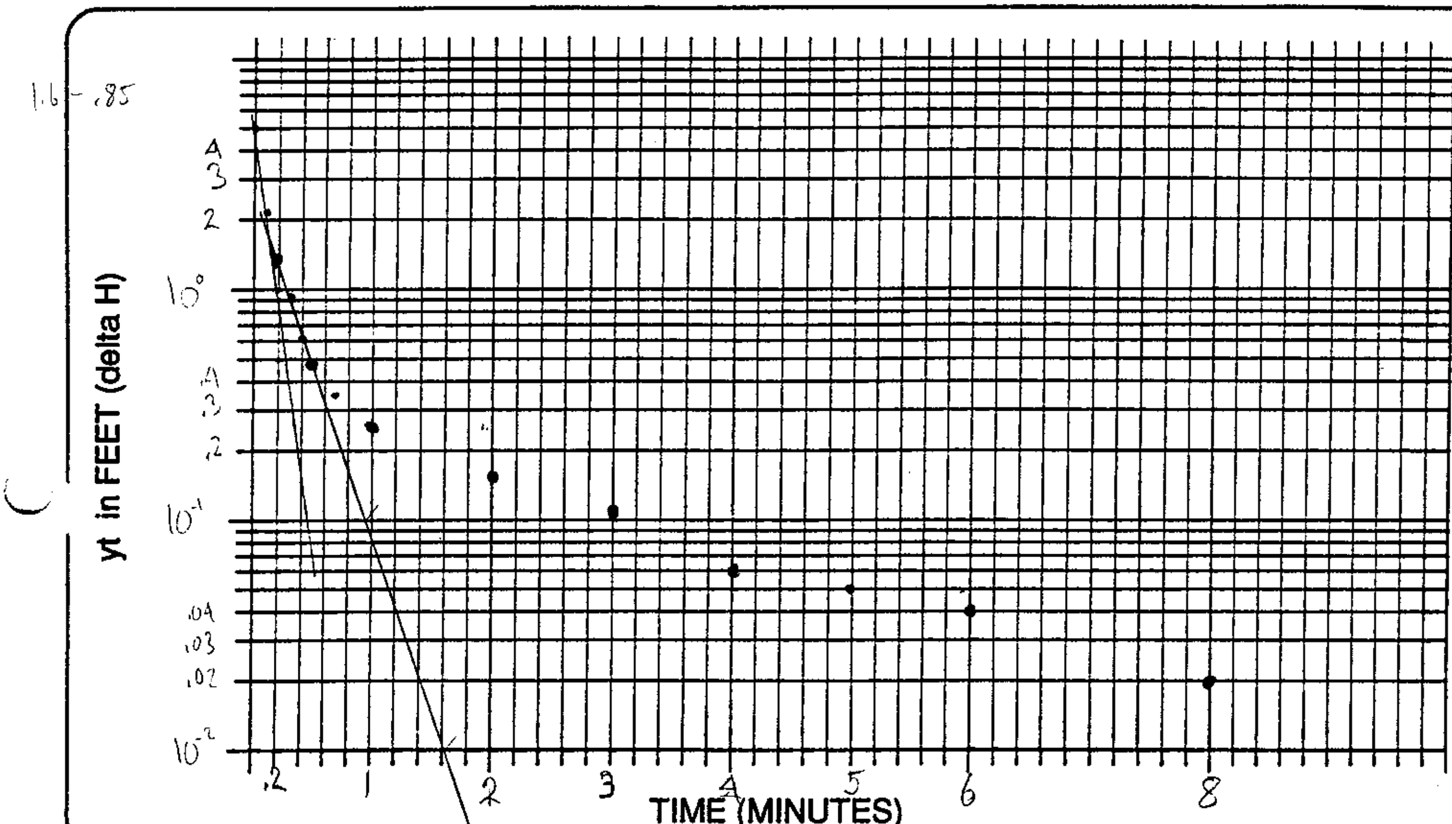
or (ft/min) times 0.508 = 3.85×10^{-4} cm/s

Client: Bonnell
Project: 20 CAP
Project #: 2040.007.92
Well: 7D
Checked By:
Title:
Date:

EMCON
SOUTHEAST

TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)
0.0 (static)		0.0	3	.11				
0.0 (slug-in)		y0=	4	.06				
0.2		1.3	5	.05				
0.5		.48	6	.04				
1.0		.24	8	.02				
2		.14						

note: If the flow test interval is not fully saturated this method is not applicable, estimate using thiem & dupuit assum.



SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

PARAMETERS:

rw= .333 ft. well radius/sandpack radius

Lw= 10.23 ft. distance from static GW to well bottom

Z= 33.8 ft. distance from water table to impermeable basement/layer

Le= 10 ft. length of open interval/sandpack

rc= .083 ft. internal radius of well casing

D= 2.3/.75=3.06 per min (1/t)*ln(yo/yt) for simplicity D equals 2.30/time required for H to drop one log cycle

A= 2.7

B= .40

C= 2.2

PARAMETER VALUES FROM PAGE 2

Client: Bonnell

Project: CAP

Project # 2040.007.92

Hydrogeologist: D. Buchalter

Well: 2SR

Date: 12-24-92

Weather:

Slug IN OUT (circle one)

EMCON

SOUTHEAST

8/92

If a partially penetrating well is tested the following equation is applicable when the test interval is fully saturated:

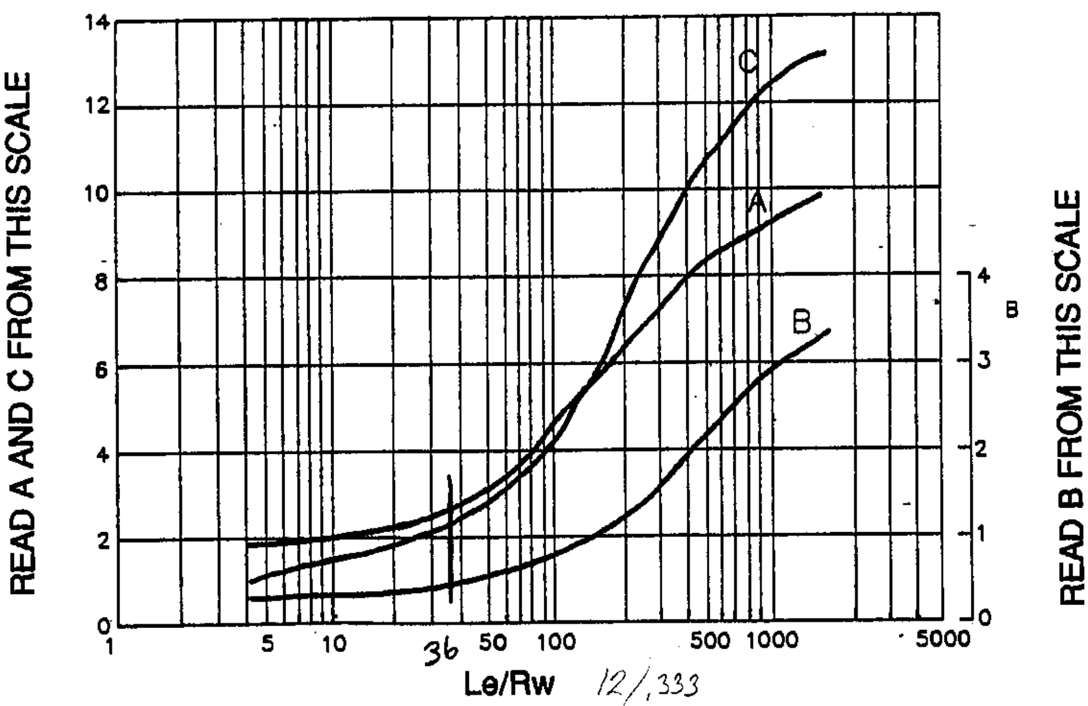
$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{A + B \ln\{(Z-Lw)/rw\}}{Le/rw} \right\}^{-1} =$$

$$\left\{ \frac{1.1}{\ln(\_\_ / \_\_)} + \frac{2.2 + .40 \ln\{(33.2 - 6.25)/.333\}}{12 / .333} \right\}^{-1} = 2.6$$

If a fully penetrating well is tested the following equation is applicable when the test interval is fully saturated:

$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{C}{Le/rw} \right\}^{-1} = \left\{ \frac{1.1}{\ln(\_\_ / \_\_)} + \frac{\_\_}{\_\_ / \_\_} \right\}^{-1} = \_\_$$

FLOW GEOMETRY PLOT TO DETERMINE A, B, OR C



A= 2.2

B= .40

C= 2.2

SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

K(ft/min) = (rc²DE)/(2Le)

K = (.083² [illegible] 2.616)/2(12) = 1.9x10⁻³ ft/min

or (ft/min) times 1440 = [illegible] ft/day

or (ft/min) times 0.508 = 8.9x10⁻⁴ cm/s

Client: Bonnell

Project: CAP

Project #: 2040.007.92

Well: 25R

Checked By:

Title:

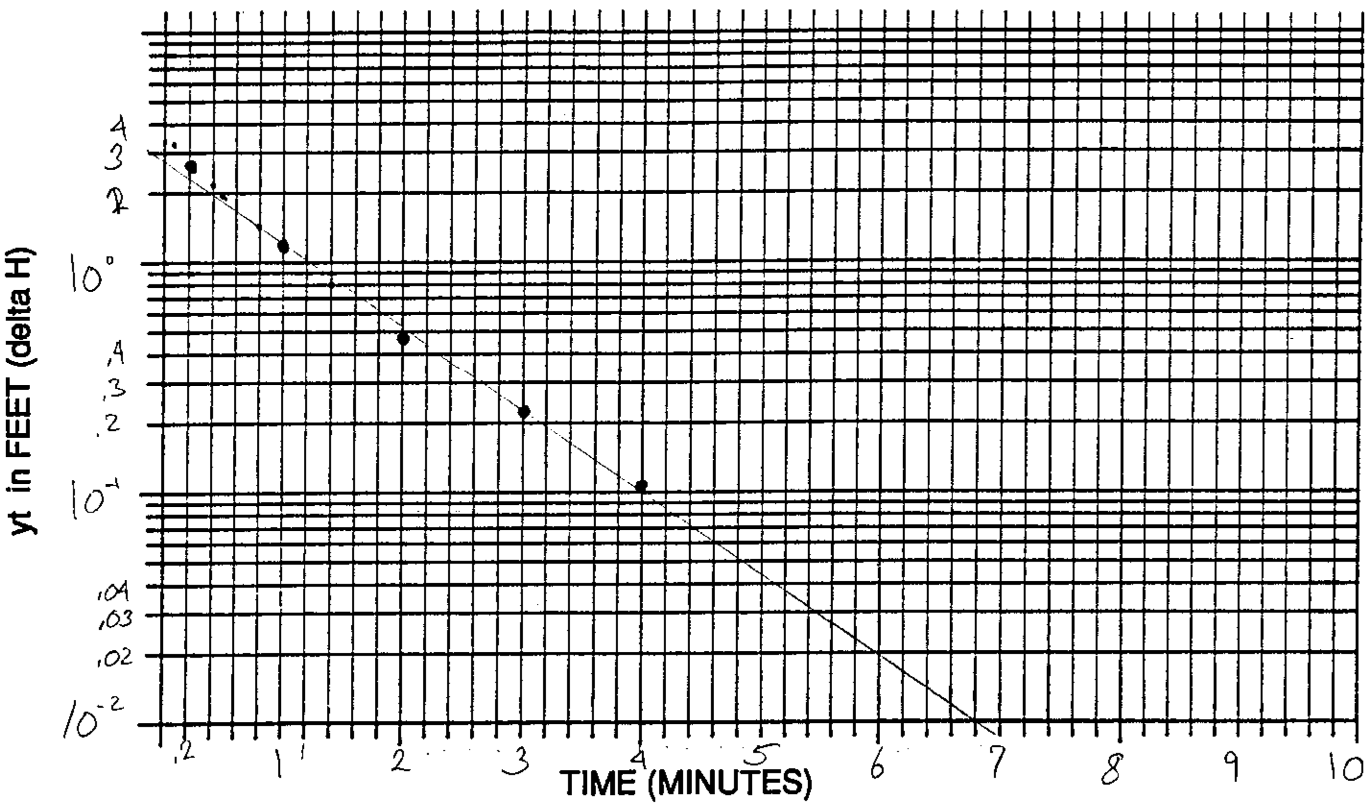
Date:

EMCON

SOUTHEAST

TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)
0.0 (static)		0.0	4		0.10			
0.0 (slug-in)		y0=						
0.2		2.7						
1.0		1.2						
2.0		0.46						
3.0		0.22						

note: If the flow test interval is not fully saturated this method is not applicable, estimate using thiem & dupuit assum.



SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

PARAMETERS:

rw= .333 ft. well radius/sandpack radius
Lw= 40.7 ft. distance from static GW to well bottom
Z= 40.7 ft. distance from water table to impermeable basement/layer
Le= 12 ft. length of open interval/sandpack
rc= .083 ft. internal radius of well casing
D= 2.3 / 2.8 per min (1/t)*ln(yo/yt) for simplicity D equals 2.30/time required for H to drop one log cycle

A= 2.7
B= .40
C= 2.2

PARAMETER VALUES FROM PAGE 2

Client: Bonnell
Project: CAP
Project # 2040.007.92
Hydrogeologist: D. Buchalter
Well: OS3D
Date: 12-26-92
Weather:
Slug IN OUT (circle one)

EMCON
SOUTHEAST

8/92

If a partially penetrating well is tested the following equation is applicable when the test interval is fully saturated:

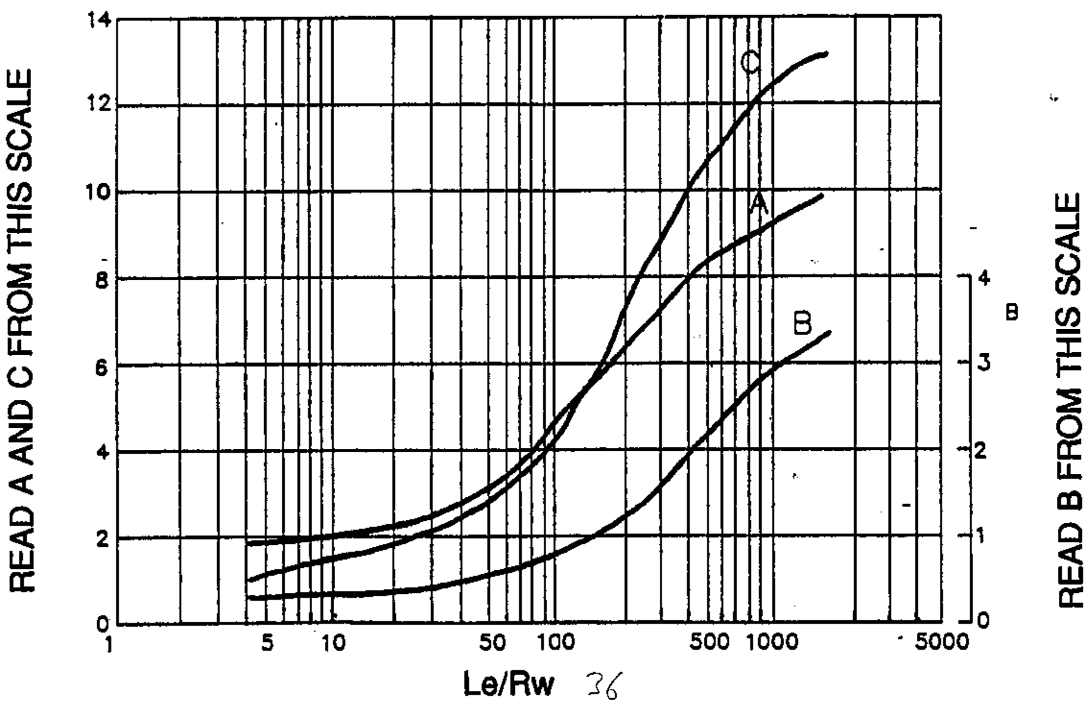
$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{A + B \ln\{(Z-Lw)/rw\}}{Le/rw} \right\}^{-1} =$$

$$\left\{ \frac{1.1}{\ln(\_\_\_/\_\_\_)} + \frac{\_\_\_ + \_\_\_ \ln\{(\_\_\_ - \_\_\_)/\_\_\_\}}{\_\_\_/\_\_\_} \right\}^{-1} = \_\_\_$$

If a fully penetrating well is tested the following equation is applicable when the test interval is fully saturated:

$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{C}{Le/rw} \right\}^{-1} = \left\{ \frac{1.1}{\ln(40.7\ /\ .333)} + \frac{2.2}{12\ /\ .33} \right\}^{-1} = 3.45$$

FLOW GEOMETRY PLOT TO DETERMINE A, B, OR C



A= 2.7

B= .40

C= 2.2

SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

$K(ft/min) = (rc^2DE)/(2Le)$

K = (.023² .82 3.45)/2(12) = 8.1×10^{-4} ft/min

or (ft/min) times 1440 = 1.17 ft/day

or (ft/min) times 0.508 = 4.1×10^{-4} cm/s

Client: Bonnell

Project: CAP

Project #: 2040.007.92

Well: OS3D

Checked By:

Title:

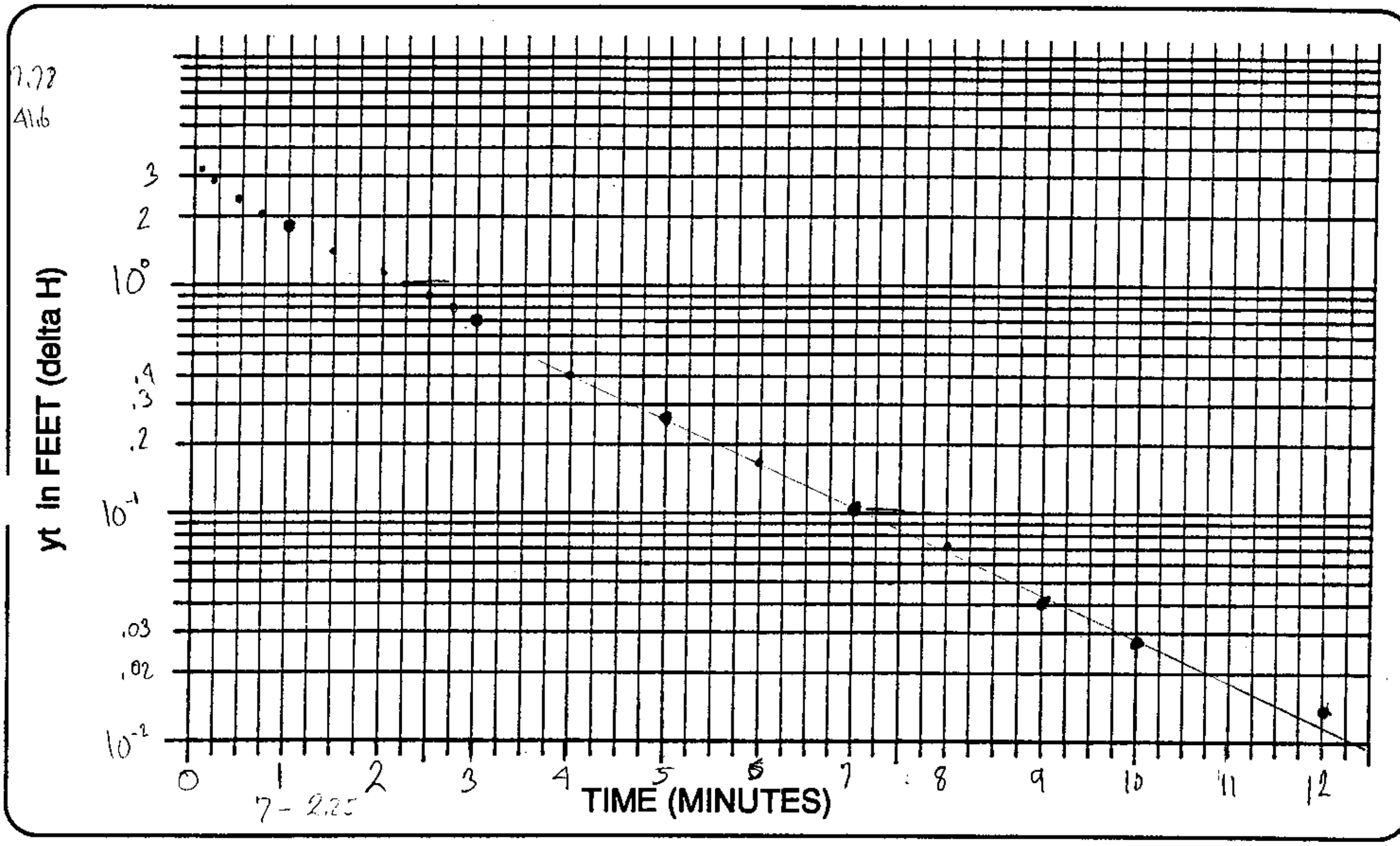
Date:

EMCON

SOUTHEAST

TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)
0.0 (static)		0.0	9		.04			
0.0 (slug-in)		y0=	10		.028			
1		1.8	12		.013			
3		0.7						
5		0.26						
7		0.10						

note: If the flow test interval is not fully saturated this method is not applicable, estimate using thiem & dupuit assum.



SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

PARAMETERS:

rw= .333 ft. well radius/sandpack radius

Lw= 33.8 ft. distance from static GW to well bottom

Z= 33.8 ft. distance from water table to impermeable basement/layer

Le= 12 ft. length of open interval/sandpack

rc= .083 ft. internal radius of well casing

D= 2.3/4.75 .48 per min (1/t)*ln(yo/yt) for simplicity D equals 2.30/time required for H to drop one log cycle

A= 2.7

B= 40

C= 2.2

PARAMETER VALUES FROM PAGE 2

Client: Bonnell
Project: CAP
Project # 2040.007.92
Hydrogeologist: D. Buchalter
Well: 2DR
Date: 12-24-92
Weather:
Slug IN OUT (circle one) — OUT circled

EMCON
SOUTHEAST

8/92

If a partially penetrating well is tested the following equation is applicable when the test interval is fully saturated:

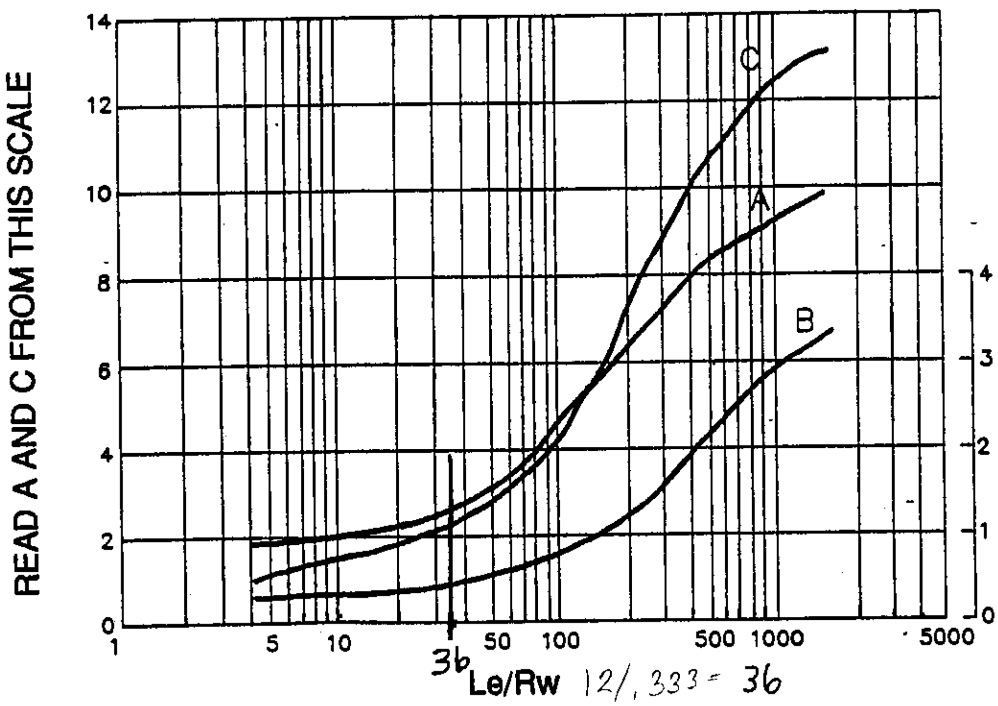
$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{A + B \ln\{(Z-Lw)/rw\}}{Le/rw} \right\}^{-1} =$$

$$\left\{ \frac{1.1}{\ln(\_\_\_/\_\_\_)} + \frac{\_\_\_ + \_\_\_ \ln\{(\_\_\_ - \_\_\_)/\_\_\_\}}{\_\_\_/\_\_\_} \right\}^{-1} = \_\_\_$$

If a fully penetrating well is tested the following equation is applicable when the test interval is fully saturated:

$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{C}{Le/rw} \right\}^{-1} = \left\{ \frac{1.1}{\ln(33.8\ /\ .333)} + \frac{2.2}{12\ /\ .333} \right\}^{-1} = 3.35$$

FLOW GEOMETRY PLOT TO DETERMINE A, B, OR C



A= 2.7

B= .40

C= 2.2

SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

$K(ft/min) = (rc^2 DE)/(2Le)$

$K = (.023^2\ \ .48\ \ 3.35)/2(12) = 4.6^{-4}$ ft/min

or (ft/min) times 1440 = .664 ft/day

or (ft/min) times 0.508 = 2.3×10^{-4} cm/s

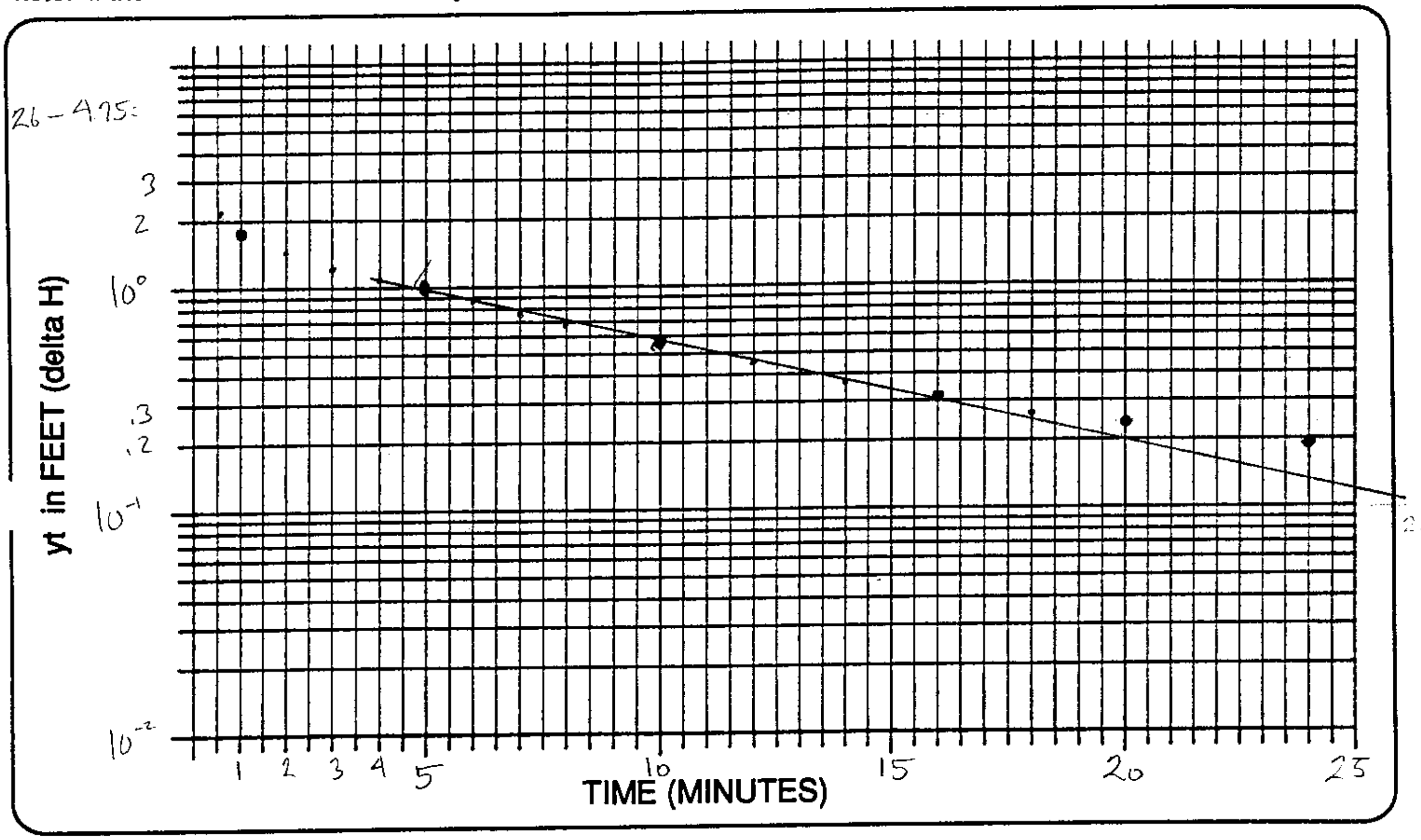
Client:
Project:
Project #
Well:
Checked By:
Title:
Date:

EMCON

SOUTHEAST

TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)
0.0 (static)		0.0	20		0.23			
0.0 (slug-in)		y0=	24		0.20			
1.0		1.7						
5.0		1.0						
10.0		0.56						
16 ~~19~~		0.31						

note: If the flow test interval is not fully saturated this method is not applicable, estimate using thiem & dupuit assum.



SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

PARAMETERS:

rw= .43 ft. well radius/sandpack radius

Lw= 27.3 ft. distance from static GW to well bottom

Z= 27.3 ft. distance from water table to impermeable basement/layer

Le= 27.3 ft. length of open interval/sandpack

rc= .166 ft. internal radius of well casing

D= 2.30/21.25=.108 per min (1/t)*ln(yo/yt) for simplicity D equals 2.30/time required for H to drop one log cycle

A= 3.5

B= .6

C= 3.1

PARAMETER VALUES FROM PAGE 2

Client: Bonnell
Project: CAP
Project # 2040.007.92
Hydrogeologist: D Bidalke
Well: DW1
Date: 12-26-92
Weather:
Slug IN (OUT) (circle one)

EMCON
SOUTHEAST

8/92

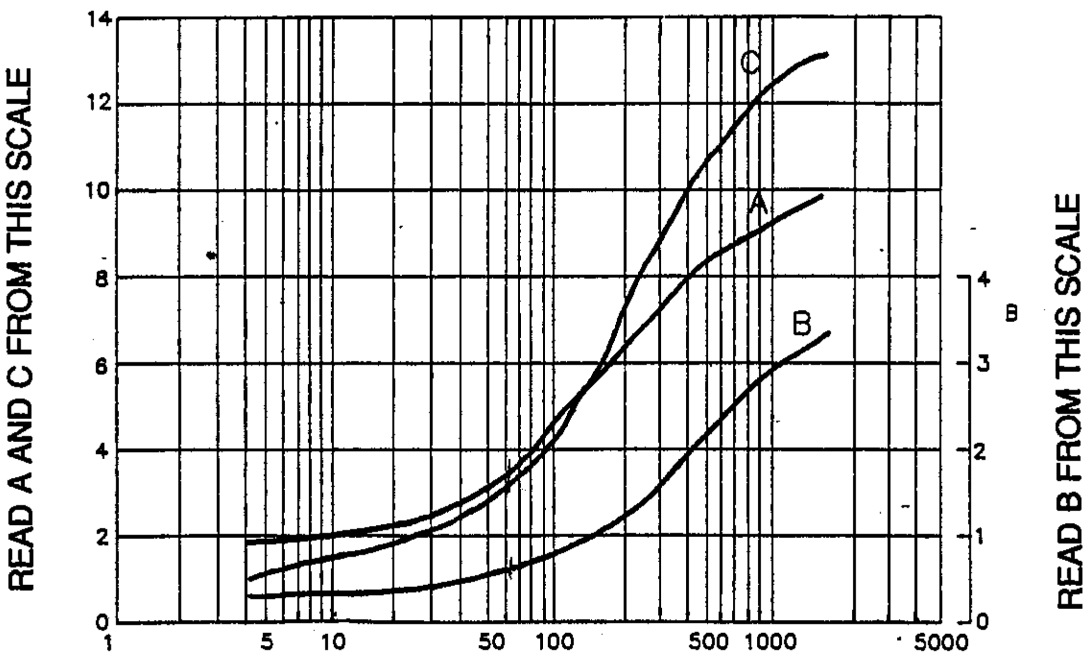
If a partially penetrating well is tested the following equation is applicable when the test interval is fully saturated:

$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{A + B\ln\{(Z-Lw)/rw\}}{Le/rw} \right\}^{-1} =$$

$$\left\{ \frac{1.1}{\ln(\_\_\_\_/\_\_\_\_)} + \frac{\_\_\_\_ + \_\_\_\_\ln\{(\_\_\_\_ - \_\_\_\_)/\_\_\_\_\}}{\_\_\_\_/\_\_\_\_} \right\}^{-1} = \_\_\_\_$$

If a fully penetrating well is tested the following equation is applicable when the test interval is fully saturated:

$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{C}{Le/rw} \right\}^{-1} = \left\{ \frac{1.1}{\ln(22.3\ /\ .43)} + \frac{3.1}{22.3\ /\ .43} \right\}^{-1} = 3.19$$



A= 3.5

B= .6

C= 3.1

Le/Rw 22.3/.43 = 62.8

SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

$K(ft/min) = (rc^2 DE)/(2Le)$

K = (.166 ² .108 3.19)/2(22.3) = 1.7×10⁻⁴ ft/min

or (ft/min) times 1440 = .25 ft/day

or (ft/min) times 0.508 = 8.8×10⁻⁵ cm/s

Client: Bonnell

Project: CAP

Project # 2040.007.92

Well: DW1

Checked By:

Title:

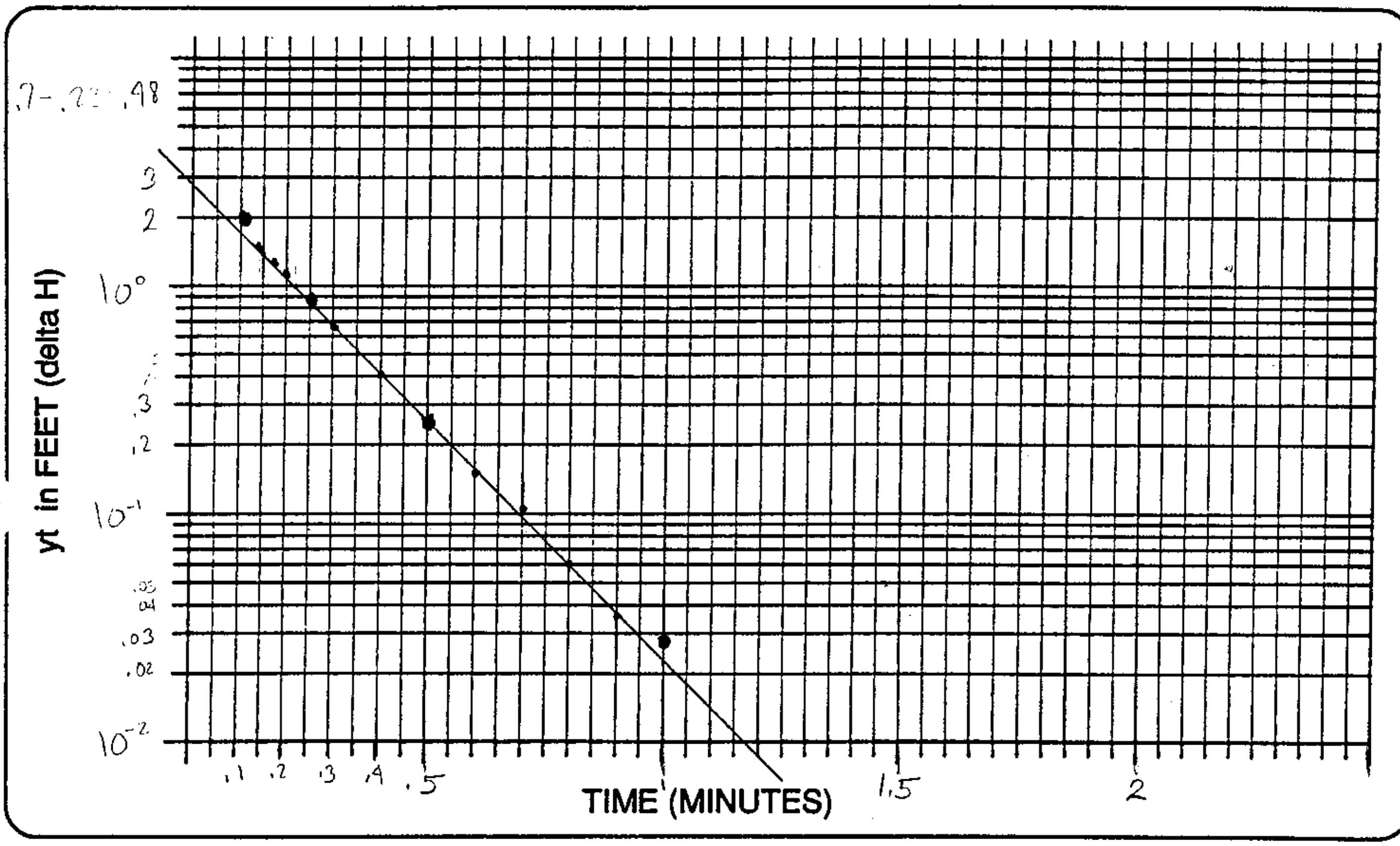
Date:

EMCON

SOUTHEAST

TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)	TIME(min)	WATER LEVEL(ft)	delta H(ft)
0.0 (static)		0.0						
0.0 (slug-in)		y0=						
0.1		2						
0.25		0.86						
0.5		0.24						
1.0		0.028						

note: If the flow test interval is not fully saturated this method is not applicable, estimate using thiem & dupuit assum.



SLUG TEST, BOUWER & RICE (Groundwater, May-June,1989)

PARAMETERS:

rw= .43 ft. well radius/sandpack radius

Lw= 20.7 ft. distance from static GW to well bottom

Z= 20.7 ft. distance from water table to impermeable basement/layer

Le= 20.7 ft. length of open interval/sandpack

rc= .166 ft. internal radius of well casing

D= 2.3/.42=5.48 per min (1/t)*ln(yo/yt) for simplicity D equals 2.30/time required for H to drop one log cycle

A= 3.2

B= .5

C= 2.8

PARAMETER VALUES FROM PAGE 2

Client: Bonnell

Project: CAP

Project # 2040.007.92

Hydrogeologist: D. Buchalter

Well: DW2

Date: 12-26-92

Weather:

Slug IN OUT (circle one) — OUT circled

EMCON

SOUTHEAST

8/92

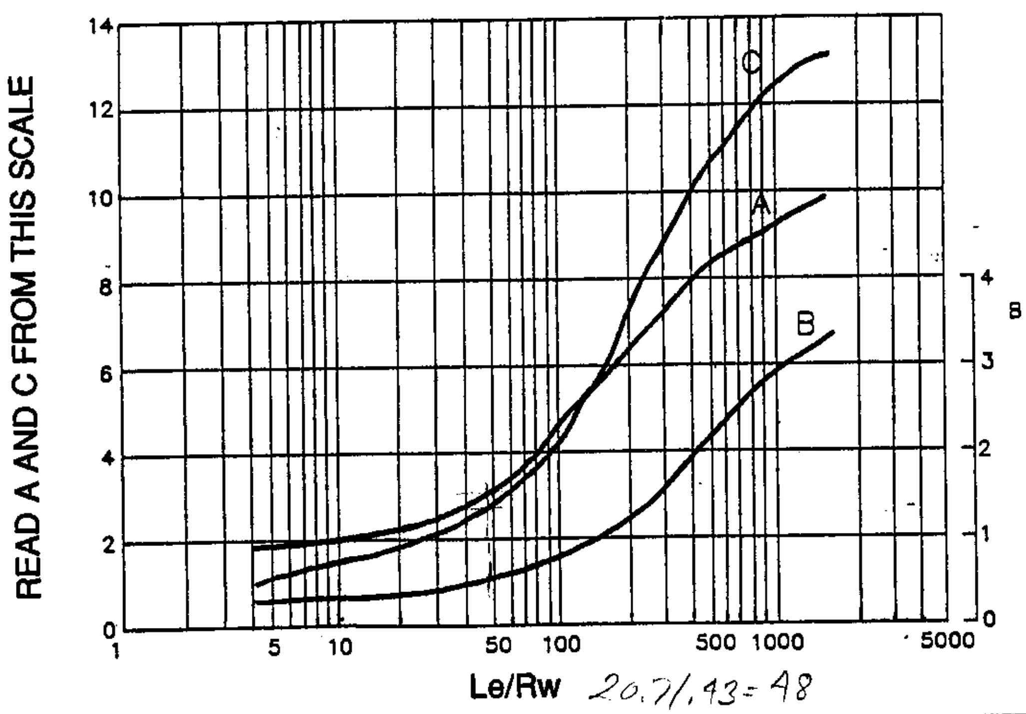
If a partially penetrating well is tested the following equation is applicable when the test interval is fully saturated:

$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{A + B \ln\{(Z-Lw)/rw\}}{Le/rw} \right\}^{-1} =$$

$$\left\{ \frac{1.1}{\ln(\_\_\_/\_\_\_)} + \frac{\_\_\_ + \_\_\_ \ln\{(\_\_\_ - \_\_\_)/\_\_\_\}}{\_\_\_/\_\_\_} \right\}^{-1} = \_\_\_$$

If a fully penetrating well is tested the following equation is applicable when the test interval is fully saturated:

$$E = \ln(Re/rw) = \left\{ \frac{1.1}{\ln(Lw/rw)} + \frac{C}{Le/rw} \right\}^{-1} = \left\{ \frac{1.1}{\ln(20.7\ /\ .43)} + \frac{2.8}{20.7\ /\ .43} \right\}^{-1} = 2.92$$



A= 3.2

B= .5

C= 2.8

SLUG TEST, BOUWER & RICE (Groundwater, May-June, 1989)

$K(ft/min) = (rc^2DE)/(2Le)$

K = (.166² 4.8 2.92)/2(20.7) = 9.33×10^{-3} ft/min

or (ft/min) times 1440 = 13.43 ft/day

or (ft/min) times 0.508 = 4.7×10^{-3} cm/s

Client: Bonnell

Project: CAP

Project #: 2040.007.92

Well: DW2

Checked By:

Title:

Date:

EMCON

SOUTHEAST

TIME	SUMMARY OF ACTIVITIES
8:50	Arrived @ Bonnell, checked in + got well keys from security office
9:10	Setting up for slug-test on well 40D inside plant
10:00	Moving to do slug/bail test on well 41D
10:15	Setting up for slug test on well 41D inside plant
10:35	Recovery Slug(Bail) on 41D
10:57	Setting up for Slug/Bail Test on 26S + 26D
11:20	Slug/Bail out on wells 26s and 26d
11:30	Moving to 25R and 2DR for SLUG/BAIL Test
11:40	Setting up on 25R and 2DR for SLUG/BAIL Test
12:35	Offsite

David [signature] 12-24-92

Time In	Time Out	Visitor Name	Company	Purpose of Visit

Minutes	Person Called	Phone Number	Purpose of Call

PROJECT DAILY REPORT

Location: Newnan GA
Date: 12-24-92
Mileage Start: 18582
Mileage End:
Weather: Good + Cool + Windy
Hrs. Lost to Weather: Ø
Equipment: Hermit 2000, W.L. Indicator, DI Water, 2 probes,

Personnel on Site: Rad + Buchater
Lodging & Location:
Meals:

Client: W. L. Bonnell
Project: Bonnell CAP
Project #: 2040.007.92
Supervisor: Rad + Buchalter
Title:

EMCON SOUTHEAST

8/92

TIME	SUMMARY OF ACTIVITIES

8/92

APPENDIX B

Triaxial Permeability Data

CHATTAHOOCHEE GEOTECHNICAL CONSULTANTS

LABORATORY WORKSHEET

TRIAXIAL PERMEABILITY　　　　Back pressure saturated

Job: 92-452.17
Client: EMCON

Sample: AQUIFER #1 DW1　　　　14-Dec-92
Number: 16.0'-16.5'

K =((3.73)*V*L/delta H*T*D*D)*(0.(= 1.83E-04

delta H =	10.00	psi
L =	5.60	
D =	2.85	
D*D =	8.12	

DATE	Time	Delta Time	V1	V2	AVG Delta V	K
14-DEC-9	8.11		0.00	24.50		
	8.15	3.50	24.60	0.00	24.55	1.804E-04 cm/sec.
	8.16	0.00	0.00	24.90		
	8.20	3.50	24.80	0.00	24.85	1.828E-04
	8.57	0.00	0.10	24.90		
	9.01	3.50	25.00	0.00	24.90	1.830E-04

CHATTAHOOCHEE GEOTECHNICAL CONSULTANTS

LABORATORY WORKSHEET

TRIAXIAL PERMEABILITY   Back pressure saturated

Job: 92-452.17
Client: EMCON

Sample: AQUIFER #2 DW2   18-Dec-92
Number: 15'-16'

K =((3.73)*V*L/delta H*T*D*D)*(0.(=   2.05E-06

delta H =	10.00	psi
L =	5.60	
D =	2.85	
D*D =	8.12	

DATE	Time	Delta Time	V1	V2	AVG Delta V	K
18-DEC-9:	1400.30		0.00	25.00		
	1405.26	296.00	24.90	0.00	24.95	2.168E-06 cm/sec.
	1406.30	0.00	0.00	25.00		
	1411.30	300.00	24.80	0.10	24.85	2.130E-06
	1412.30	0.00	0.00	25.00		
	1418.00	330.00	26.00	-1.00	25.50	1.987E-06
	1419.00	0.00	0.00	25.00		
	1424.30	330.00	26.00	-1.00	26.00	2.026E-06
	1425.30	0.00	0.00	25.00		
	1431.00	330.00	25.10	-0.10	25.10	1.956E-06

APPENDIX B

K_d Data

Columbia Analytical Services Inc.

January 6, 1993

Service Request No.: K927831

David Razieta
EMCON Southeast, Inc.
435 Atlanta Technology Center
1575 Northside Drive
Atlanta, GA 30318-4211

Re: **Bonnell - Aquifer Testing/Project #2040.007.92**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on December 16, 1992. Preliminary results were transmitted via facsimile on January 4, 1993. For your reference, these analyses have been assigned our service request number K927831.

The summarized PCE data calculated on a mass basis for the soil and solution partitioning is attached, in addition to the amount of PCE detected in each of the solutions. The lower concentrations (0.30 and 0.100 ppm) exhibited substantial volatilization during the procedure. The concentrations detected in some of the solutions from the PCE-treated soils were also within experimental error of original PCE solution used to treat the soil. We hope this data is useful for calculating the Kd coefficients.

The samples were analyzed by the suggested procedure and were mixed with the spiked PCE solutions. The PCE treated soils were allowed to settle prior to performing the instrumental analysis.

All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Dave Edelman
David L. Edelman
Technical Director

DLE/akn

cc: David Buchalter (EMCON Southeast - Atlanta)

1317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 206/577-7222 • Fax 206/636-1068

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Southeast, Inc.
Project: Bonnell - Aquifer Testing/#2040.007.92

Date Received: 12/16/92
Work Order No.: K927831

Tetrachloroethene (PCE) Sample Summary
EPA Method 8020 Modified

Sample Name: DW 1-25
Lab Code: K7831-2

Sample Mass In Grams	Soln. Conc. In μg/mL (ppm)[a]	Soln. Volume in mL	Soln. Mass PCE in μg	Soln. Conc. Found in μg/mL (ppm)	PCE MASS CALCULATED In Soln. in μg	On Solids in μg
5.08	<0.0005	42.0	<0.02	<0.0005	--	--
5.12	0.0130	41.8	0.543	0.0115	0.481	0.062
5.04	0.0617	41.2	2.54	0.0611	2.52	0.02
5.18	0.196	41.4	8.11	0.179	7.41	0.70
5.16	0.938	41.1	38.6	0.877	36.0	2.6

a Not corrected for volatilization. Original solution concentrations were 0, 0.030, 0.100, 0.300, and 1.00.

00002

Approved by Dave Ebel Date 1/6/93

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Southeast, Inc.
Project: Bonnell - Aquifer Testing/#2040.007.92

Date Received: 12/16/92
Work Order No.: K927831

Tetrachloroethene (PCE) Sample Summary
EPA Method 8020 Modified

Sample Name: DW 2-25
Lab Code: K7831-3

Sample Mass In Grams	Soln. Conc. In μg/mL (ppm)[a]	Soln. Volume in mL	Soln. Mass PCE in μg	Soln. Conc. Found in μg/mL (ppm)	PCE MASS CALCULATED In Soln. in μg	On Solids in μg
5.10	<0.0005	41.0	<0.02	<0.0005	--	--
5.08	0.0130	41.7	0.542	0.0106	0.442	0.10
5.05	0.0617	41.7	2.57	0.0586	2.44	0.13
5.20	0.196	40.8	8.00	0.183	7.47	0.53
5.01	0.938	40.9	38.4	0.651	26.6	11.8

a Not corrected for volatilization. Original solution concentrations were 0, 0.030, 0.100, 0.300, and 1.00.

Approved by Dave Eil... Date 1/6/93

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Southeast, Inc.	**Date Received:**	12/16/92
Project:	Bonnell - Aquifer Testing/#2040.007.92	**Date Extracted:**	12/22/92
Sample Matrix:	Soil	**Date Analyzed:**	12/24/92
		Work Order No.:	K927831

Tetrachloroethene (PCE) Solutions in Contact with Soil
EPA Method 8020 Modified
mg/L (ppm)

Sample Name	Lab Code	MRL	Result
DW1-25	K7831-2(SB)	0.0005	ND
DW1-25	K7831-2(0.030)	0.0005	0.0115
DW1-25	K7831-2(0.100)	0.0010	0.0611
DW1-25	K7831-2(0.300)	0.0025	0.0179
DW1-25	K7831-2(1.00)	0.010	0.877
DW2-25	K7831-3(SB)	0.0005	ND
DW2-25	K7831-3(0.030)	0.0005	0.0106
DW2-25	K7831-3(0.100)	0.0010	0.0586
DW2-25	K7831-3(0.300)	0.0025	0.183
DW2-25	K7831-3(1.00)	0.010	0.651

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Dom Edel.A Date 1/6/93

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Southeast, Inc.	**Date Received:**	12/16/92
Project:	Bonnell - Aquifer Testing/#2040.007.92	**Date Extracted:**	12/22/92
Sample Matrix:	Soil	**Date Analyzed:**	12/24/92
		Work Order No.:	K927831

Tetrachloroethene (PCE) Solutions in Contact with Soil
EPA Method 8020 Modified
mg/L (ppm)

Sample Name	Lab Code	MRL	Result
Method Blank	K7831-MB	0.0005	ND
0.030 Standard	K7831-30	0.0005	0.0130
0.100 Standard	K7831-100	0.0010	0.0617
0.300 Standard	K7831-300	0.0025	0.196
1.00 Standard	K7831-1000	0.010	0.938

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Dave Ehle [signature] Date 1/6/93

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APPENDIX A

LABORATORY QC RESULTS

1317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 206/577-7222 • Fax 206/636-1068

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Southeast, Inc.	**Date Received:**	12/16/92
Project:	Bonnell - Aquifer Testing/#2040.007.92	**Date Analyzed:**	12/24/92
Sample Matrix:	Water	**Work Order No.:**	K927831

Surrogate Recovery Summary
Halogenated Volatile Organic Compounds
EPA Methods 5030/8010

Sample Name	**Lab Code**	**Percent Recovery** *a,a,a*-Trifluorotoluene
DW1-25	K7831-2(0.030)	100
DW1-25	K7831-2(0.100)	100
DW1-25	K7831-2(0.300)	100
DW1-25	K7831-2(1.000)	100
DW2-25	K7831-3(0.030)	100
DW2-25	K7831-3(0.100)	100
DW2-25	K7831-3(0.300)	100
DW2-25	K7831-3(1.000)	100
Soil Blank	K7831-2(SB)	101
Soil Blank	K7831-3(SB)	100
Method Blank	K7831-MB	101
	CAS Acceptance Criteria	78-119

Approved by Dave Ed... Date 1/6/93

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Southeast, Inc.	**Date Received:**	12/16/92
Project:	Bonnell - Aquifer Testing/#2040.007.92	**Date Analyzed:**	12/24/92
Sample Matrix:	Water	**Work Order No.:**	K927831

Surrogate Recovery Summary
Halogenated Volatile Organic Compounds
EPA Methods 5030/8010

Sample Name	**Lab Code**	**Percent Recovery** α,α,α-Trifluorotoluene
0.030 Standard	K7831-30	100
0.100 Standard	K7831-100	100
0.300 Standard	K7831-300	100
1.00 Standard	K7831-1000	100
	CAS Acceptance Criteria	78-119

Approved by Dave Ekel. / Date 1/6/93

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APPENDIX B

CHAIN OF CUSTODY INFORMATION

1317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 206/577-7222 • Fax 206/636-1068

EMCON
Southeast

December 14, 1992
Project Number 2040.007.92

David Edelman, PhD
Columbia Analytical Services
1317 South 13th Avenue
P.O. Box 479
Kelso, Washington 98626

RE: The William L Bonnell Company, Inc.
K_d Batch Testing

Dear Dave:

Thanks for your response to my request for K_d batch testing. I have enclosed four samples that I hope arrive in good condition. The samples are from two aquifer test discharge wells DW1 and DW2 from an industrial client, The William L Bonnell Company. I have enclosed some ideas on procedures and spiked solutions (hopefully correct) for your additional review.

If you have any questions, please do not hesitate to call. Also, please call when you receive these samples. Thanks.

Sincerely,

EMCON Southeast

David Radzieta/bb

David Radzieta
Project Manager - Hydrogeology

DR/bb

Enclosures

cc: David Buchalter

PROCEDURE FOR EACH SAMPLE

1. Oven dry the sample 105°C to 110°C overnight.

2. a. Loosen up any soil clods that may have formed during shipment by grinding with a mortar and pestle.
   b. For 10-gram sample aliquots - half the sample by splitting a pile.
   c. For 5-gram aliquots - quarter the sample by dividing a pile.

3. Take the sample half (or quarter), re-pile it, and divide the pile into quarters for each sample aliquot.

4. Weigh each aliquot to four significant digits and note the mass.

5. The aliquotes will be placed into 40-mil (for 5-gram samples) or 100-mil (for 10 gram samples) VOA vials or similarly suitable containers. These can be weighed before starting to simplify mass determination. At this point also label four blank VOA vials for blank samples of each solution.

6. Dip the VOA vials into an ice bath for 60 seconds to reduce sample and vial temperatures then fill the OVA vials with the spiked PCE solutions, taking care to note the volume of solution added. (For head space analytical techniques where the vial is not completely filled, a known volume is added. For no head space analytical techniques, before and after vial weights or calibrated pipettes/burets are used to determine the volume of solution added. Be careful at this stage since fluids can collect on vial threads.)

7. The samples are slowly tumbled for five minutes, allowed to settle for 30 minutes, and centrifuged to separate the solids onto the bottom of the container (until a distinct clear phase is present).

8. The clear phase liquid is analyzed to determine the concentration, and thus mass, of PCE remaining in solution. For blank samples that differ significantly with initial solution concentrations, the blank is assumed to be the initial starting concentration to correct for volatilization and adsorption onto sample containers. For head space techniques, an additional time of 1 hour may be required to allow for proper PCE partitioning between solid, liquid, and gaseous phases.

9. The initial mass of PCE added is simply the volume added times the initial concentration (or blank concentration). The mass adsorbed is simply the final liquid concentration mass subtracted from the initial (or blank) concentration mass.

   Since not all adsorption processes are linear (i.e., in particular at higher concentrations with immiscible phases/constituents) more than two data points are necessary to determine if the adsorption isotherm is a Fruendlich type, Langmuir type, or exponential type of process. The four concentrations selected for this study follow an approximate log normal scale that bracket the 0.0 to approximately 500 µg/l groundwater concentrations observed in the field.

FOR SPIKED SOLUTIONS

Density of PCE at approximately 15°C is 1.6311 gm/ml. I would start by mixing a stock solution - add 0.06131 ml PCE to 999.9387 ml H_2O or 0.07 ml PCE to 1,000 ml H_2O to account for potential volatilization.

In this solution I would have a teflon coated magnetic stirrer. This makes a stock 0.1 gm/l or 100 mg/l solution of approximately 1.0001 gm/cg density (if you can get the PCE to dissolve completely).

Add 10 ml of this stock solution to 990 ml H_2O for an approximate 1,000 µg/l solution, add 3 ml stock solution to 997 ml H_2O for 300 µg/l solution, add 1 ml stock solution to 999 ml H_2O for 1000 µg/l solution, and add 0.3 ml of the stock solution to 999.7 ml H_2O for the 30 µg/l solution. The final solutions should be storable in a chilled state without PCE leaving solution into immiscible phase. These four solutions also require analysis bringing the total analysis count up to 24 and cost to $2,400 (i.e., $100/sample).

Columbia

C7831

Kelso, Washington

ASI ANALYTICAL SERVICES, INC.

~~ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS~~

~~390 TRABERT AVENUE • ATLANTA, GEORGIA 30309 • (404) 892-8144~~

FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: 2040.007.92

PROJECT NAME: Aquifer Testing - Bonnell

CLIENT NAME: ~~W.L. Bonnell Company~~ EMCON SE,

PROJECT MANAGER: D. Buchalter

COPY TO:

REQUESTED COMP. DATE:

SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☒ OTHER ____

CLIENT ADDRESS AND PHONE NUMBER: 1575 Northside Dr. Ste 435, Atlanta GA 30318 404355-5600

ANALYSES REQUESTED: Kd determination using PCE

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	Kd determination using PCE	LAB ID	REMARKS
	11-30-92			X	X	DW1-15	1	X		Hold until we call you
	11-30-92			X	X	DW1-25	1	X		Run 1st
	12-7-92			X	X	DW2-25	1	X		Run 2nd
	12-7-92			X	X	DW2-35	1	X		Hold until we call you

FOR LAB USE ONLY: LAB# / LAB # / PROJECT NO. / ACK / VERIFIED / QUOTE# / BS / NO. OF SAMP / PG / OF

SAMPLED BY AND TITLE: D. Radzieta	DATE/TIME: As Above	RELINQUISHED BY: Dan Radzieta	DATE/TIME: 12-14-92
RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME
RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME
RECEIVED BY LAB: [signature]	DATE/TIME: 12-16-92 0930	SAMPLE SHIPPED VIA: UPS BUS (FED-EX) HAND OTHER ____	AIR BILL #

HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
COC / ICE
ANA REQ / TEMP
CUST SEAL / PH
SAMPLE COND.

REMARKS: Hold Samples for potential loss on ignition analysis for T.O.C,

ENTERED INTO LIMS ____ COC REVIEWD ____

CoC bia

Kelso, Washington

ASI ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

390 TRABERT AVENUE • ATLANTA, GEORGIA 30309 • (404) 892-8144

FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: 2040.007.92

PROJECT NAME: Aquifer Testing - Bonnell

CLIENT NAME: ~~W.L. Bonnell Company~~ EMCON SE,

CLIENT ADDRESS AND PHONE NUMBER: 1575 Northside Dr. Ste 435 Atlanta GA 30318 404 355-5600

PROJECT MANAGER: D. Buchalter

COPY TO:

REQUESTED COMP. DATE:

SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☒ OTHER ____

ANALYSES REQUESTED: Kd determination using PCE

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	Kd determination using PCE	LAB ID	REMARKS
	11-30-92			X	X	DW1-15	1	X		Hold until we call you
	11-30-92			X	X	DW1-25	1	X		Run 1st
	12-7-92			X	X	DW2-25	1	X		Run 2nd
	12-7-92			X	X	DW2-35	1	X		Hold until we call you

FOR LAB USE ONLY

LAB#

LAB #

PROJECT NO.

ACK | VERIFIED

QUOTE# | BS

NO. OF SAMP | PG | OF

SAMPLED BY AND TITLE: D. Radzieta	DATE/TIME: As Above	RELINQUISHED BY: Dan Radzieta	DATE/TIME: 12-14-92
RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME
RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME
RECEIVED BY LAB: [signature]	DATE/TIME: 12-16-92 0930	SAMPLE SHIPPED VIA: UPS BUS (FED-EX) HAND OTHER ____	AIR BILL #

HAZWRAP/NEESA Y N

QC LEVEL 1 2 3

COC | ICE

ANA REQ | TEMP

CUST SEAL | PH

SAMPLE COND.

REMARKS: Hold Samples for potential loss on ignition analysis for T.O.C,

ENTERED INTO LIMS

COC REVIEWD

0001

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

[redacted]

[redacted]

Sample Matrix: Soil

Date Extracted: 12 / 22 / 92

Date Analyzed: 12 / 24 / 92

Work Order No.: K927831

TETRACHLOROETHENE (PCE) SOLUTIONS IN CONTACT WITH SOIL
(Method Title)

EPA Method 8020 MODIFIED
(Method No.)

mg/L (ppm)
(Units)

~~Basis~~

Sample Name	Lab Code	MRL	Result
METHOD BLANK	K7831-MB	0.0005	ND
0.030 STANDARD	-30	0.0005	0.0130
0.100 STANDARD	-100	0.0010	0.0617
0.300 STANDARD	-300	0.0025	0.196
1.00 STANDARD	-1000	0.010	0.938

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by__________ Date________ Filename: GEN1A/03-13-92

TOTAL P.05

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

[redacted]

[redacted]

Sample Matrix: Soil

Date Received: [redacted]

Date Extracted: 12/22/92

Date Analyzed: 12/24/92

Work Order No.: K927831

TETRACHLOROETHENE (PCE) SOLUTIONS IN CONTACT WITH SOIL
(Method Title)

EPA Method 8020 MODIFIED
(Method No.)

mg/L (ppm)
(Units)

~~Basis~~

Sample Name	Lab Code	MRL	Result
~~METHOD BLANK~~	~~K7831-MB~~	~~0.0005~~	~~ND~~
DW 1-25	-2 (SB)	0.0005	ND
↓	-2 (.030)	0.0005	0.0115
↓	-2 (0.100)	0.0010	0.0611
↓	-2 (0.300)	0.0025	0.179
↓	-2 (1.00)	0.010	0.877
DW 2-25	-3 (SB)	0.0005	~~0.0106~~ ND
↓	-3 (.030)	0.0005	~~0.0586~~ 0.0106
↓	-3 (0.100)	0.0020	0.0586
↓	-3 (0.300)	~~0.010~~ 0.0025	0.183
↓	-3 (1.00)	0.010	0.651

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by__________ Date__________ Filename: GEN1A/03-13-92

EMCON SOUTHEAST COMPUTATION SHEET

PROJECT TITLE: Bonnell Aquifer Test
DESCRIPTION: Bonnell Saprolite Kd Determinations
PREPARED BY: Radzieta DATE: 1-5-92 CHK'D BY:
PROJECT NO. 2040.001.97 SHEET ___ OF ___ DATE: ___

Sample DW1-25feet

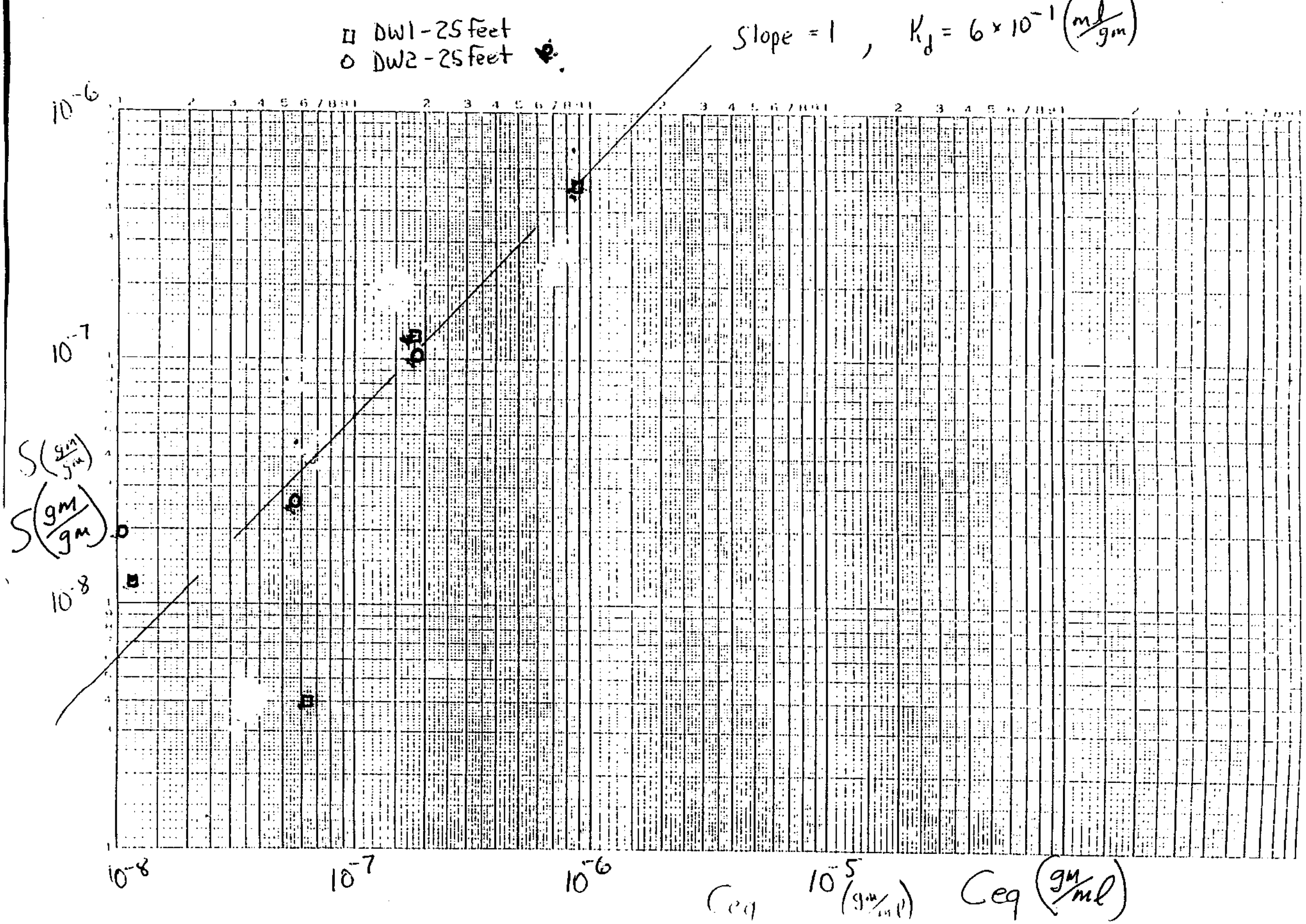
Sample Mass (gm)	Soln. Conc. (ug/ml)	Initial Soln. Conc. (gm/ml)	Soln. Vol. (ml)	Soln. Mass PCE (gm)	(Ceq) Equilibrium Soln. Conc. (Ceq) (gm/ml)	Equilibrium Partitions: PCE Mass in Soln. (gm)	PCE Mass on Solids (gm)	(S) Mass PCE Adsorbed (gm) / Mass of Soil (gm)	$K_d = (S/C_{eq})$ (ml/gm)
5.08	<0.0005	$<5.0\times10^{-10}$	42.0	$<2.1\times10^{-8}$	$<5.0\times10^{-10}$	—	—	—	
5.12	0.0130	1.30×10^{-8}	41.8	5.43×10^{-7}	1.15×10^{-8}	4.81×10^{-7}	6.20×10^{-8}	1.21×10^{-8}	1.01×10^{0}
5.04	0.0617	6.17×10^{-8}	41.2	2.54×10^{-6}	6.11×10^{-8}	2.52×10^{-6}	2.00×10^{-8}	3.97×10^{-9}	6.50×10^{-2}
5.18	0.196	1.96×10^{-7}	41.4	8.11×10^{-6}	1.79×10^{-7}	7.41×10^{-6}	7.00×10^{-7}	1.35×10^{-7}	7.54×10^{-1}
5.16	0.938	9.38×10^{-7}	41.1	3.86×10^{-5}	8.71×10^{-7}	3.60×10^{-5}	2.60×10^{-6}	5.04×10^{-7}	5.75×10^{-1}

Sample DW2-25feet

Sample Mass (gm)	Soln. Conc. (ug/ml)	Initial Soln. Conc. (gm/ml)	Soln. Vol. (ml)	Soln. Mass PCE (gm)	Equilibrium Soln. Conc. (Ceq) (gm/ml)	PCE Mass in Soln. (gm)	PCE Mass on Solids (gm)	S (gm/gm)	K_d (ml/gm)
5.10	<0.0005	$<5.0\times10^{-10}$	41.0	$<2.1\times10^{-8}$	$<5.0\times10^{-10}$	—	—	—	
5.08	0.0130	1.30×10^{-8}	41.7	5.42×10^{-7}	1.06×10^{-8}	4.42×10^{-7}	1.00×10^{-7}	1.97×10^{-8}	1.86×10^{0}
5.05	0.0617	6.17×10^{-8}	41.7	2.57×10^{-6}	5.86×10^{-8}	2.44×10^{-6}	1.30×10^{-7}	2.57×10^{-8}	4.39×10^{-1}
5.20	0.196	1.96×10^{-7}	40.8	8.00×10^{-6}	1.83×10^{-7}	7.47×10^{-6}	5.30×10^{-7}	1.02×10^{-7}	5.57×10^{-1}
5.01	0.938	9.38×10^{-7}	40.9	3.84×10^{-5}	6.51×10^{-7}	2.66×10^{-5}	1.18×10^{-5}	2.36×10^{-6}	3.63×10^{0}

Ave. = $1.1\times10^{0}\ \frac{ml}{gm}$

EMCON SOUTHEAST
435 ATLANTA TECHNOLOGY CENTER
ATLANTA, GEORGIA 30318


□ DW1 - 25 feet
○ DW2 - 25 feet
Slope = 1 , $K_d = 6 \times 10^{-1}$ (ml/gm)
10^{-6}
10^{-7}
10^{-8}
S (gm/gm)
10^{-8}
10^{-7}
10^{-6}
10^{-5} (gm/ml)
Ceq (gm/ml)

EMCON SOUTHEAST COMPUTATION SHEET

PROJECT TITLE: Bonnell Aquifer Test PROJECT NO. 2040.007.92

DESCRIPTION: Kd Saprolite Determinations + Retardation SHEET ___ OF ___

PREPARED BY: Radzieta DATE: 1-5-92 CHK'D BY: ______ DATE: ______

FROM GRAPH

K_d (y-intercept) = $6 \times 10^{-1} \left(\frac{ml}{gm}\right)$ = $\frac{cc}{gm}$

$R = 1 + \frac{\rho_b K_d}{\phi} = 1 + \frac{1.60 \, gm/cc \times 0.6 \, cc/gm}{0.40}$

$R = 3.40$

FROM Averages of $K_d = 1.1 \times 10^{0} \frac{ml}{gm}$

$R = 1 + \frac{\rho_b K_d}{\phi} = 1 + \frac{1.60 \, gm/cc \times 1.1}{0.40}$

$R = 5.4$

435 ATLANTA TECHNOLOGY CENTER
1575 NORTHSIDE DRIVE
ATLANTA, GEORGIA 30318
(404) 355-5600

EMCON SOUTHEAST

APPENDIX B

TOC Data

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Southeast, Inc.	**Date Received:**	12/16/92
Project:	Aquifer Testing - Bonnell/#2040.007.92	**Work Order No.:**	K930038
Sample Matrix:	Soil		

Inorganic Parameters
Percent (%)
Dry Weight Basis

		Total Organic Carbon (TOC)	Solids, Total (TS)
	Analyte:	Total Organic Carbon (TOC)	Solids, Total (TS)
	Method:	ASTM D 4129-82M	EPA 160.3M
	Method Reporting Limit:	0.05	--
	Date Analyzed:	01/07/93	01/06/93
Sample Name	**Lab Code**		
DW1-25	K7831-2	0.13	87.4
DW2-25	K7831-3	0.15	91.1
Method Blank	K0038-MB	ND	--

ASTM American Society of Testing and Materials
M Modified
ND None Detected at or above the method reporting limit

Approved by Dave Ehl. [signature] Date 1/15/93

EMCON SOUTHEAST COMPUTATION SHEET

PROJECT TITLE: Corrective Action Plan PROJECT NO. 2040.007.92
DESCRIPTION: Soil Surption Coefficient Determination SHEET ___ OF ___
PREPARED BY: ___ DATE: ___ CHK'D BY: ___ DATE: ___

foc DW1 -25 .13/100
foc DW2 -25 .15/100

Koc = 359 for PCE

Kd = foc Koc
= .0013 × 359
= .48

EMCON SOUTHEAST
435 ATLANTA TECHNOLOGY CENTER
1575 NORTHSIDE DRIVE
ATLANTA, GEORGIA 30318
(404) 355-5600

APPENDIX B

Computation Sheets for Mass Transport of PCE Soil Vapors Into the Groundwater at the Former PCE Degreasing Unit

EMCON SOUTHEAST COMPUTATION SHEET

PROJECT TITLE: Stage II PCE Source Area Inv. PROJECT NO. 2040.007.42
DESCRIPTION: Mass transfer of PCE from Soil Vapor to Groundwater SHEET ___ OF ___
PREPARED BY: PSB DATE: ___ CHK'D BY: ___ DATE: ___

Area of Soil vapor (from Figure ___)

1. 100 ppm Contour: $2 \text{ in.} \times 1.5 \text{ in.} \times 400 \text{ sq.ft}/\text{in}^2 = 1000 \text{ sq.ft.}$
   1000 ppm Contour: $1 \text{ in.} \times .5 \text{ in.} \times 400 \text{ sq.ft}/\text{in}^2 = 200 \text{ sq.ft.}$

$C_g = H C_w$

2. Since the response factor for PCE is 1/.7 the actual concentration is $\frac{1000}{.7} = 1430 \text{ ppm}$ and $\frac{100}{.7} = 140 \text{ ppm}$.

3. the mass concentration is:
   A) $\frac{1430}{1{,}000{,}000} \times 6.78 \text{ g/l} = 9.7 \times 10^{-3} \text{ g/L}$ for the 1000 ppm OVA reading
   B) $\frac{140}{1{,}000{,}000} \times 6.78 \text{ g/l} = 9.5 \times 10^{-4} \text{ g/L}$ for the 100 ppm OVA reading
   where $\text{density}^{PCE} = 6.78 \text{ g/l}$

4. Henries Constant = ,0153 atm-m³/mol
   to make this dimensionless

5. $$H_{dimensionless} = \frac{.0153 \text{ atm-m}^3/\text{mol}}{8.20575 \times 10^{-5} \text{ atm}\cdot\text{m}^3/\text{mol}\cdot\text{K} \times 288.7^{\circ K} (60^{\circ F})}$$
   $$= .645$$

6. Calculate the pore water concentrations
   $$C_{w_{1000}} = \frac{9.7 \times 10^{-3}}{.645}$$
   $$= .015 \text{ g/l} \Rightarrow 15 \text{ mg/l}$$

EMCON SOUTHEAST COMPUTATION SHEET

PROJECT TITLE: ______ PROJECT NO. ______
DESCRIPTION: ______ SHEET 2 OF 2
PREPARED BY: DLS DATE: ______ CHK'D BY: ______ DATE: ______

$$C_{w_{100}} = \frac{9.5 \times 10^{-4}}{.645} g/l$$
$$= 1.5 \times 10^{-3} g/l \Rightarrow 1.5 \, mg/l$$

7. Assuming 3 feet of the aquifer comes into equilibrium with the vapor phase. This ~~assum~~ is based on a dilution factor of five which seems reasonable since monitoring well 40D which is about feet downgradient of the degreaser unit and shows PCE concentrations of about 390 ug/l.

The mass of PCE per ~~unit~~ volume of groundwater under the 1000 and 100 ppm contours is:

Mass PCE = 200 sq.ft. × 3 ft. (depth) × .3 (porosity) × 15 mg/l × 28.3 l/ft³
+ 1000 sq ft. × 3 ft × .3 × 1.5 mg/l × 28.3 l/ft³

= 293 grams

8. The mass transfer per year is equal to the mass of PCE under the 1000 and 100 ppm contours since the length of the 100 ppm contour area is equal to the distance traveled by the groundwater in one year.

∴ the approximate mass of PCE transferred to the groundwater per year is <u>.64 lbs</u>

APPENDIX C

SWIFT III and MODFLOW Model Description

APPENDIX C

SWIFT III Model Description

TABLE OF CONTENTS

FIGURES

1.0 INTRODUCTION

This appendix presents a description of the numerical modeling method and describes the site-specific Bonnell ground water and transport models.

2.0 NUMERICAL MODELING METHOD

Quantitative models of ground water systems and pollutant transport are developed by describing the hydrogeologic system in mathematical terms. In both cases, partial differential equations govern the physical processes involved. Exact mathematical (analytical) solutions to these differential equations are known, but only in a limited number of simplified and well-defined cases. On the other hand, site-specific numerical solutions to these equations, utilizing the speed and iterative capability of the computer, are available with a high degree of accuracy.

If the hydrogeology of an area is not too complex, or if the degree of accuracy required is not too great, analytical solutions may form the basis of a model. Moderately complex problems often require a two-dimensional numerical (computer) model. For very complex problems, where more than one subsurface layer exists or where multiple flow components are expected, a three-dimensional numerical model may be more appropriate. This is the case at the Bonnell Company site, where the numerous creeks and pond play such a large role in the behavior of the ground water system.

The evaluation of ground water pollution problems is a two step process. Initially, a computer model is developed that describes the pattern and magnitude of ground water flow. This model then provides the flow field for a companion solute transport model, which simulates actual contaminant movement within the aquifer system.

2.1 *Ground Water Flow Modeling*

A numerical ground water model is a computerized representation of a real-world hydrogeologic system, incorporating all of its significant characteristics. Its construction can be broken down into a four-step process:

1. Identifying the natural boundaries of the hydrogeological system;

2. Describing the subsurface geometry of the system (the positions of all significant aquifers, etc.);

3. Supplying the inherent hydraulic properties of the system; and

4. Calibrating the model to simulate and reproduce characteristics of the real-world system.

The first step in the development process is to identify the physical system to be modeled and the natural features that define its boundaries. In much the same way that isolated surface water systems exist, and can identified by their characteristic drainage basins, ground water systems often occur in individual hydrogeologic basins. An example of this analogy is shown in Figure F-1. Surface water basins are bound by major topographic divides. Similarly, hydrogeologic basins are bound by major streams and rivers, or by impermeable geologic materials (such as clay or bedrock-valley walls, etc.). In the example shown, the ground water basin is bound by streams on either side. A ground water divide occurs in the center of the basin, which delimits the point separating ground water flow in the aquifer to one stream or the other. The underlying impermeable layer forms the bottom boundary. Within each hydrogeologic basin the factors that affect ground water movement are isolated; exterior stresses, such as pumping in an adjacent basin, have little or no effect.

The second step in the development of a model is the identification of major hydrogeologic units within the basin and describing their geometry in a manner that can be easily entered and handled by the computer. To facilitate this process, a rectangular grid is superimposed upon the study area, thereby discretizing the model domain into a finite number (often a thousand or more) of subregions as shown in Figure F-2. The location of each subregion, or cell is referenced by the coordinates (i,j,k), where "i" is the x-direction and "j" is the y-direction, and "k" is the vertical direction (increasing downward). The number and location of cells in the horizontal directions are generally user-defined. The location and thickness of each cell in the vertical direction usually coincides with a particular hydrogeologic layer, although several cells can be used to represent a single horizon.

Once the system's geometry has been discretized, every cell within the model is assigned hydraulic properties representative of the geologic layer of which that cell is part. For a steady-state model, hydraulic conductivity (permeability) is the primary property required. The end result is a three-dimensional array of cells that represents as best as possible the heterogeneous geologic features and properties of the model domain. Rainfall/recharge, pumpage, and other stresses occurring within the system may also be input to the computer.

The finite-difference scheme can then be used to solve the governing partial differential equation. The procedure involves writing a system of algebraic equations relating the variation of hydraulic head (hydraulic pressure) from cell to cell. As is the case with even the smallest system of equations, some conditions must be known before the remainder of the system can be solved. For a ground water model, known conditions must exist along the grid boundaries. These may be of two types: specified head or specified flux (i.e., flow rate). Fortunately, this is not a problem since the model boundaries, if correctly established, coincide with the boundaries of a hydrogeologic basin. Boundaries that follow the reach of a river are given a specified (fixed) head equal to the elevation of water in the river. Impermeable boundaries or ground water divides are assigned a zero flux condition, since no flow can take place across the

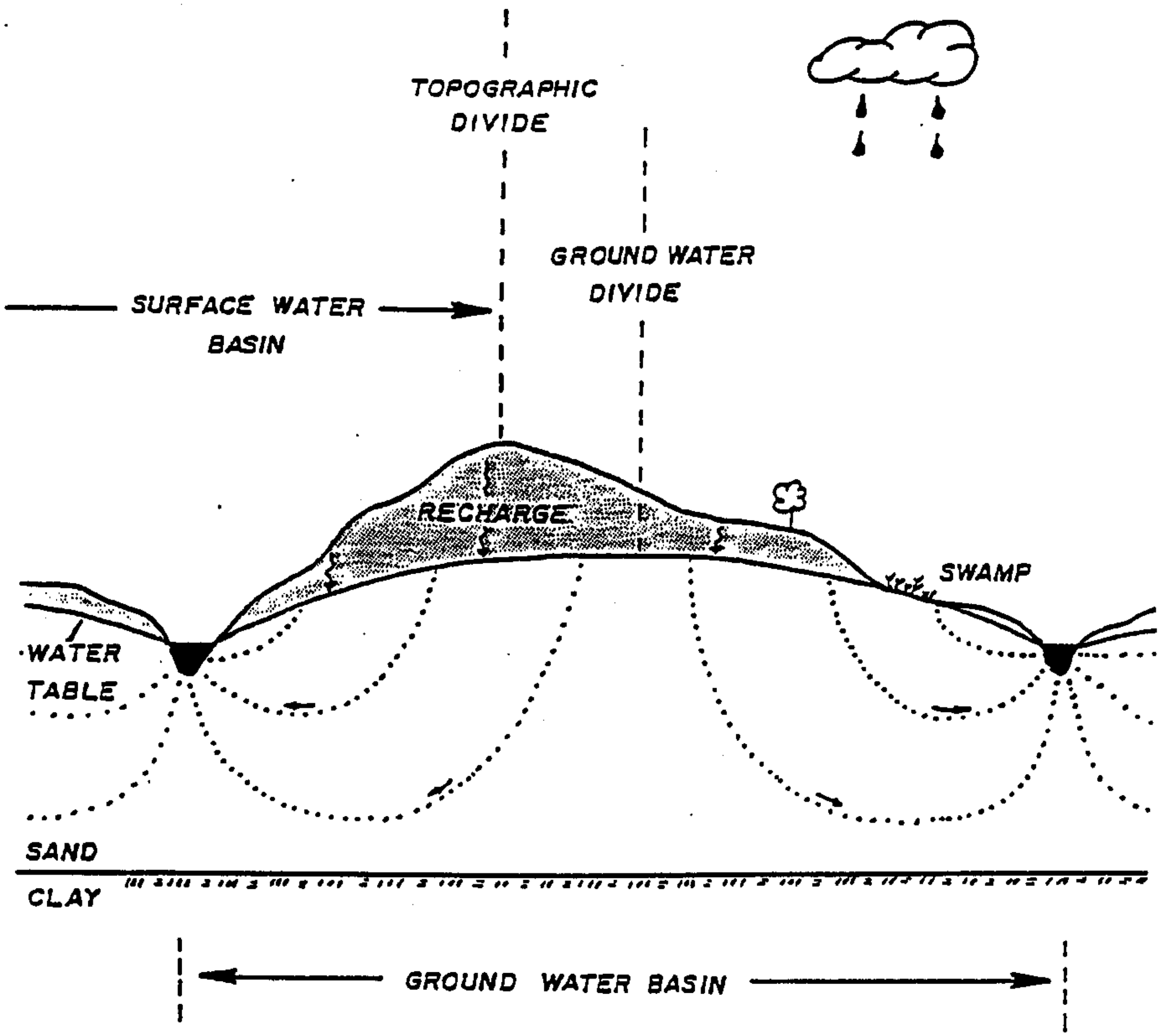


Figure F-1: Schematic of ground water flow between two streams and the concept of a *hydrogeologic basin*.

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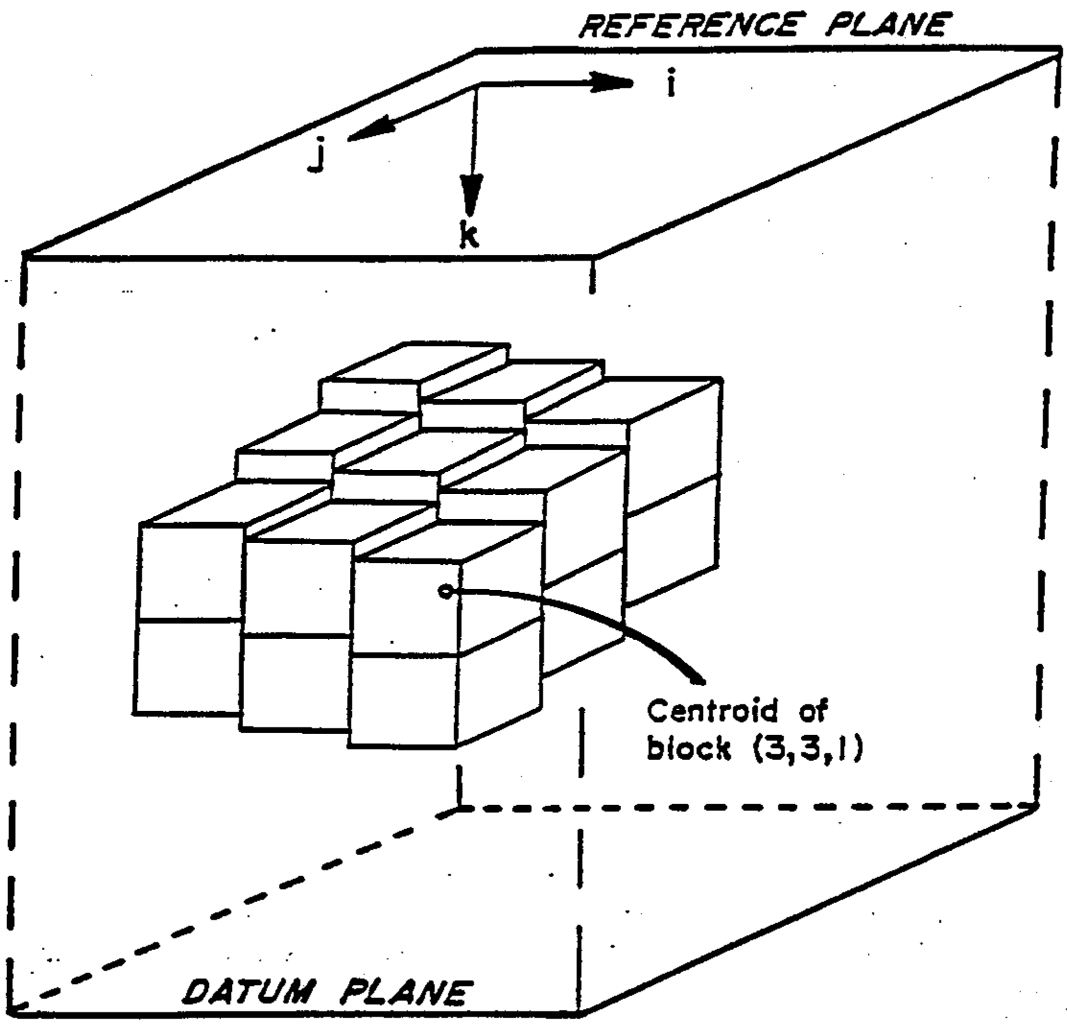

Figure F-2: Schematic of three-dimensional finite-difference block and coordinate system.

boundary. Once the boundary conditions have been supplied, the system of equations can be solved iteratively, usually with some form of Gaussian elimination. The approximate hydraulic head at each cell within the interior of the grid is calculated based upon the known conditions at the grid boundaries. This process is then repeated again, calculating new hydraulic heads from the old approximate heads. Iteration continues until the calculated head converges upon a single non-changing value of hydraulic head for each cell.

The model is then calibrated against the real-world system. As trial computer runs are performed, the water levels computed by the model are compared to a map of observed water levels within the real aquifer system. The two will not agree if the three major components of the model--aquifer geometry, boundary conditions, and hydraulic properties (permeability, recharge and other stresses)--have not been correctly specified. However, by modifying the hydraulic properties (within a predetermined range of uncertainty) and by making minor changes in aquifer geometry, the model's output can eventually be made to match the observed conditions. In this trial and error way the model is calibrated. The model then represents an approximation of the real-world system, and can, within limits, be used to predict the behavior of the real-world system, even under a variety of new conditions.

2.2 *Contaminant Transport Modeling*

The contaminant transport model is a companion of the ground water flow model; they use the same finite-difference grid and aquifer geometry. Similarly, they both utilize a finite-difference technique to solve a governing partial differential equation.

For contaminant transport, a mass-balance approach is used to obtain a solution. The separate terms of the transport equation represent the following processes:

[convection] + [dispersion] - [retardation] +/-
[injection/production] = [accumulation]

Convective contaminant migration is due solely to the flow of ground water, which carries with it a given pollutant concentration. The flow model must therefore be performed first in order to establish a flow field for the convection term of the transport model. The second term is dispersion (i.e., a "spreading" of the pollutant). This process is thought to be the result of mechanical mixing as the contaminant traverses a tortuous path through individual sand grains and local heterogeneities. The third term, retardation, can represent a variety of mechanisms for attenuating pollutants, such as the adsorption to clays. The last term on the left-hand side of the equation represents contaminants entering the system through injection or surface spills, or exiting the system via discharge to wells, springs, and streams.

The transport model's output represents the average contaminant concentration within each (i,j,k) cell contained in the grid. Ideally, the transport phase of the study also involves calibration, where model parameters are adjusted until the output matches a known contamination event. This is often difficult, however, due to the lack of detailed historical knowledge, such as when and how much contaminant was released.

The transport model can be used to simulate, subject to the above physical processes, contaminant movement through time, the levels of pollutant loading to nearby rivers, or the reduction of contaminant levels resulting from the operation of interceptor wells.

2.3 *The SWIFT III Computer Model*

The model selected for use at Bonnell is the Sandia Waste Isolation Flow and Transport model (SWIFT). The model was originally developed for Sandia National Laboratories by three consulting firms (Intercomp, Inc.; Intera, Inc.; and Geotrans, Inc.) over a ten-year period. The Nuclear Regulatory Commission sponsored this work under its high-level nuclear waste program. The model was developed under a rigorous quality assurance and control program. Extensive testing of the code against known solutions has been performed. A detailed description of the development and testing of SWIFT, as well as the theory behind it, can be found in Finley and Reeves (1982) and Reeves, et.al. (1986).

SWIFT's final form (SWIFT III) is a fully three-dimensional ground water flow and solute transport model, capable of simulating variable density flow, heat and brine transport, and flow in both porous and fractured media. The model can handle steady state or transient processes in both confined and unconfined aquifers. The program, written in FORTRAN, has the ability to simulate a variety of injection/production wells and aquifer boundary conditions.

The simulations for this study are being performed on a DEC MicroVAX computer. For the regional model, a typical run consumes about 20 minutes of CPU time (operating in a steady-state mode on 3,108 grid cells). The local model's requirements are substantially larger owing the large 6,837 cell matrix, requiring about 1.5 hours for the initial steady state flow solution and an additional 2 hours for every year of contaminant travel simulation.

3.0 REGIONAL FLOW SYSTEM

In the early stages of model development it was quickly found that no single model could be constructed that would incorporate both the area-wide regional hydrogeologic features and at the same time provide enough resolution at the site scale to accurately define local phenomena. (Figure F-3 shows these regional features as best they are known.) Two models were therefore employed. The first is a regional-scale model covering the wide area around the site. The second is a local-scale model, which is a

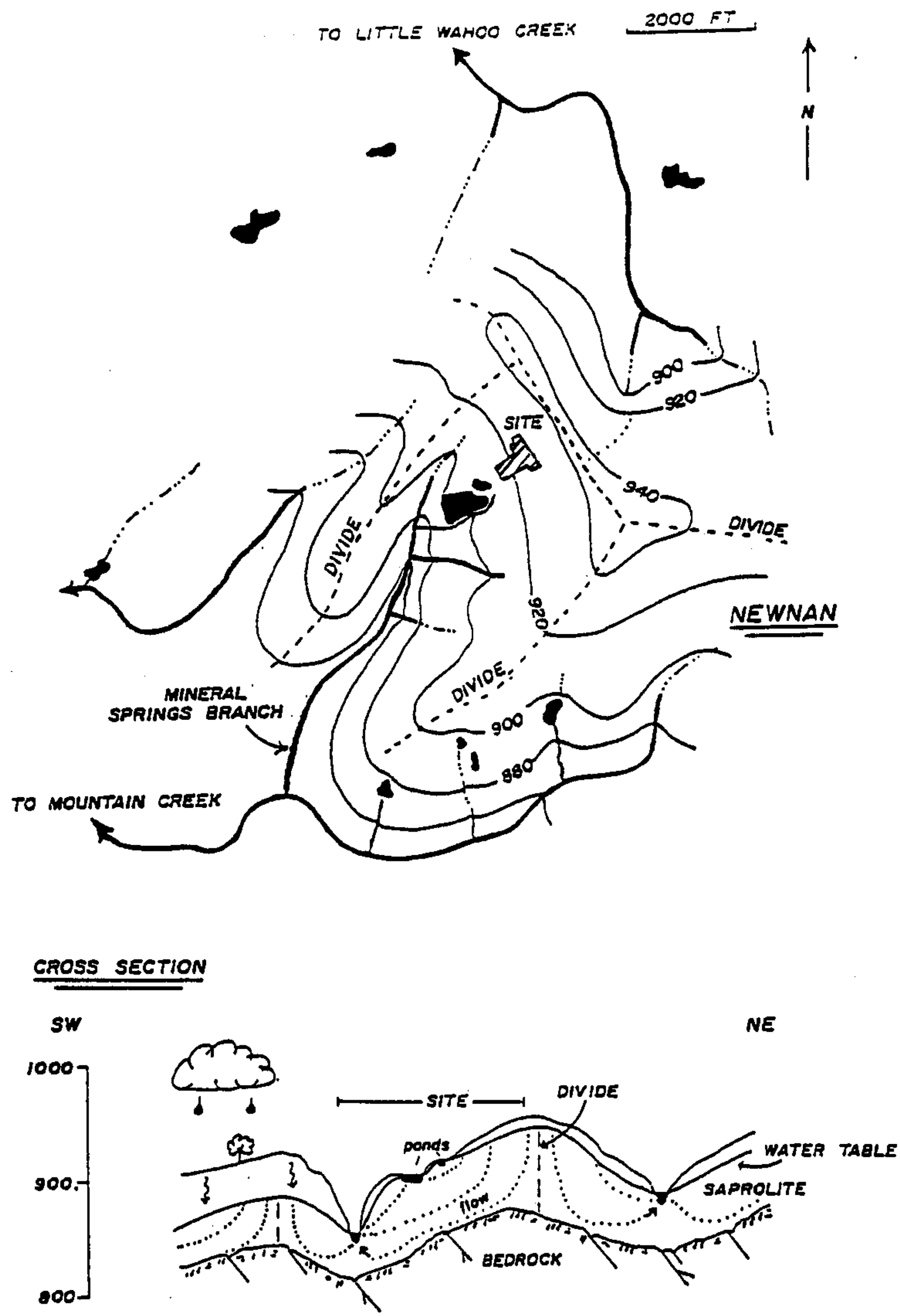

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Figure F-3: Regional hydrogeologic boundaries and approximate water levels.
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subset of the larger model. Water levels computed by the regional model were used to establish the boundary conditions prescribed along the edges of the local model. In this way the local site area could be modeled with a much higher resolution than would otherwise be possible, while transferring the characteristics of the regional system, mainly the elevation and shape of the water table, into the local scale.

Figure F-4 shows the regional finite-difference grid developed for this site, which is designed such that three of its boundaries coincide with the approximate regional divides shown in Figure F-3. The northern and eastern boundaries of the model coincide with the main regional divide separating ground water flow from the Little Wahoo and Mountain Creek tributaries. The western edge of the model lies along a smaller divide between Mineral Springs Branch and a second small tributary further west. No-flow boundary conditions are prescribed on these model edges. (The actual nature of water flow is vertically downward, and not horizontally across the divide.) Along the southern model edge there not a conveniently located divide. However, in this area ground water flow is directly toward the Mineral Springs Branch on both sides, which is approximately parallel with the southern model boundary. Thus, a no flow condition also exists if only water movement across the model boundary is considered.

Vertically the regional model is comprised of three equally spaced layers of cells stacked upon the bedrock. Therefore it was necessary to first develop a bedrock contour map on the regional scale. Bedrock data at the site scale had to be extrapolated well outside of the range of data coverage. While the result was at best an approximation, the usefulness of the regional model--serving only to provide the general patterns of ground water behavior and as a starting point for the local model--was not invalidated.

Calibration of the regional model was performed by varying rainfall/recharge and permeability such that computed water levels along the edges of the interior local model approximately matched those observed near the periphery of the site, although in some areas the local data base still does not extend as far as we would have liked. The final calibration parameters selected were four inches per year of recharge and a permeability of one ft/day. No anisotropy was considered in the regional modeling effort. Figure F-5 shows the water levels computed by the regional model, together with the outline of the local-scale model grid.

In terms of the three-dimensionality of the flow system, vertical components of flow exist only along the boundaries of the regional model (or, in the real world, near the ground water divides) and in the immediate vicinity of streams. Near the divides this reflects the movement of rainfall/recharge initially downward to the base of the aquifer, followed quickly by horizontal movement toward area streams. As the streams are approached vertical components are again established as water moves upward to the base of the streams to be discharged. Over most of the model area, however, most flow is almost entirely horizontal. This suggests that, if it were not for the observed phenomenon of contaminants migrating under shallow streams, a two dimensional model would have been appropriate for this site.

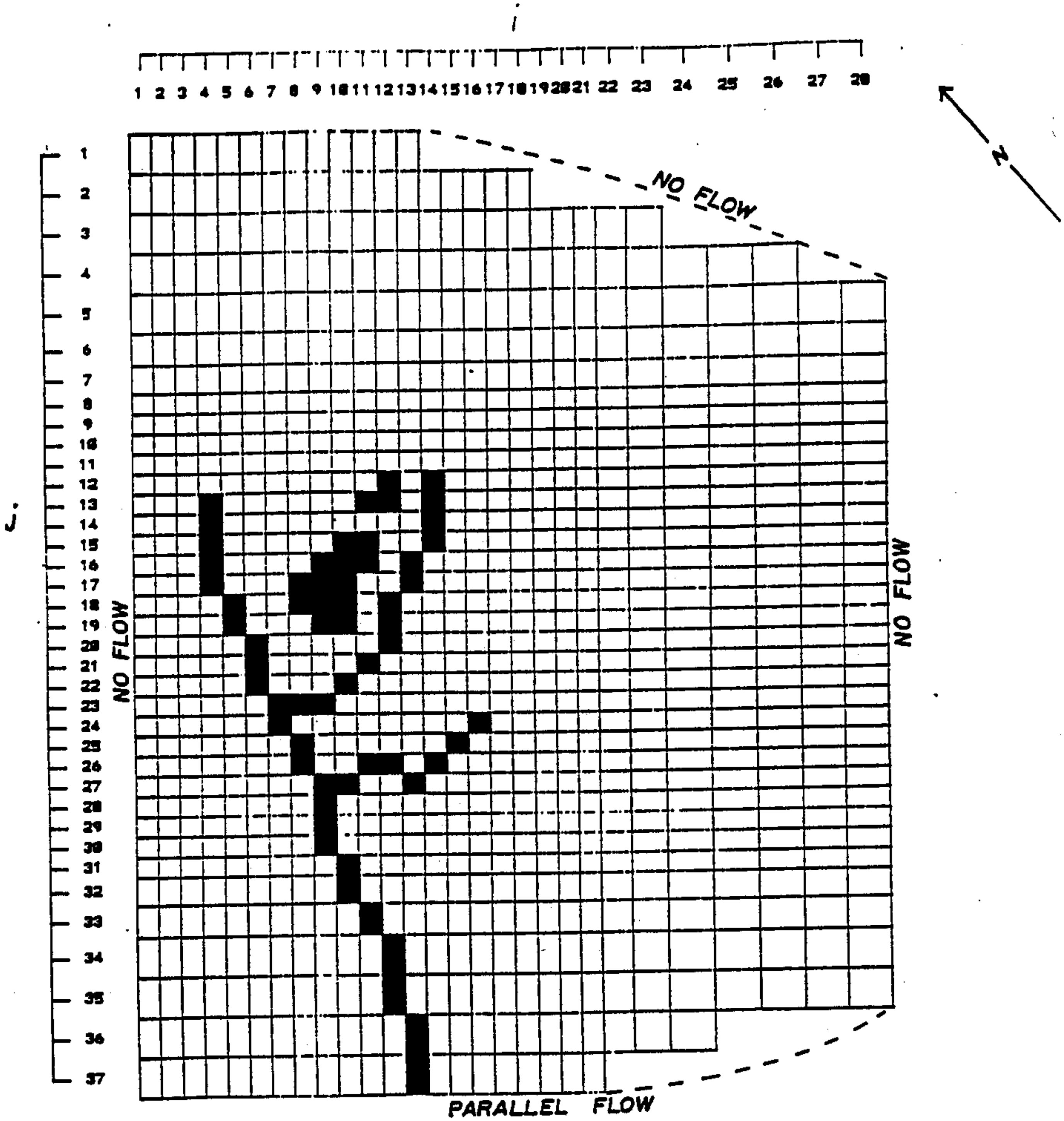

Figure F-4: Areal view of the regional finite-difference grid and imposed boundary conditions (top, left and right: no-flow across ground water divide; bottom: flow parallel to model boundary and directly to Main Creek). Blacked out cells represent streams or ponds.

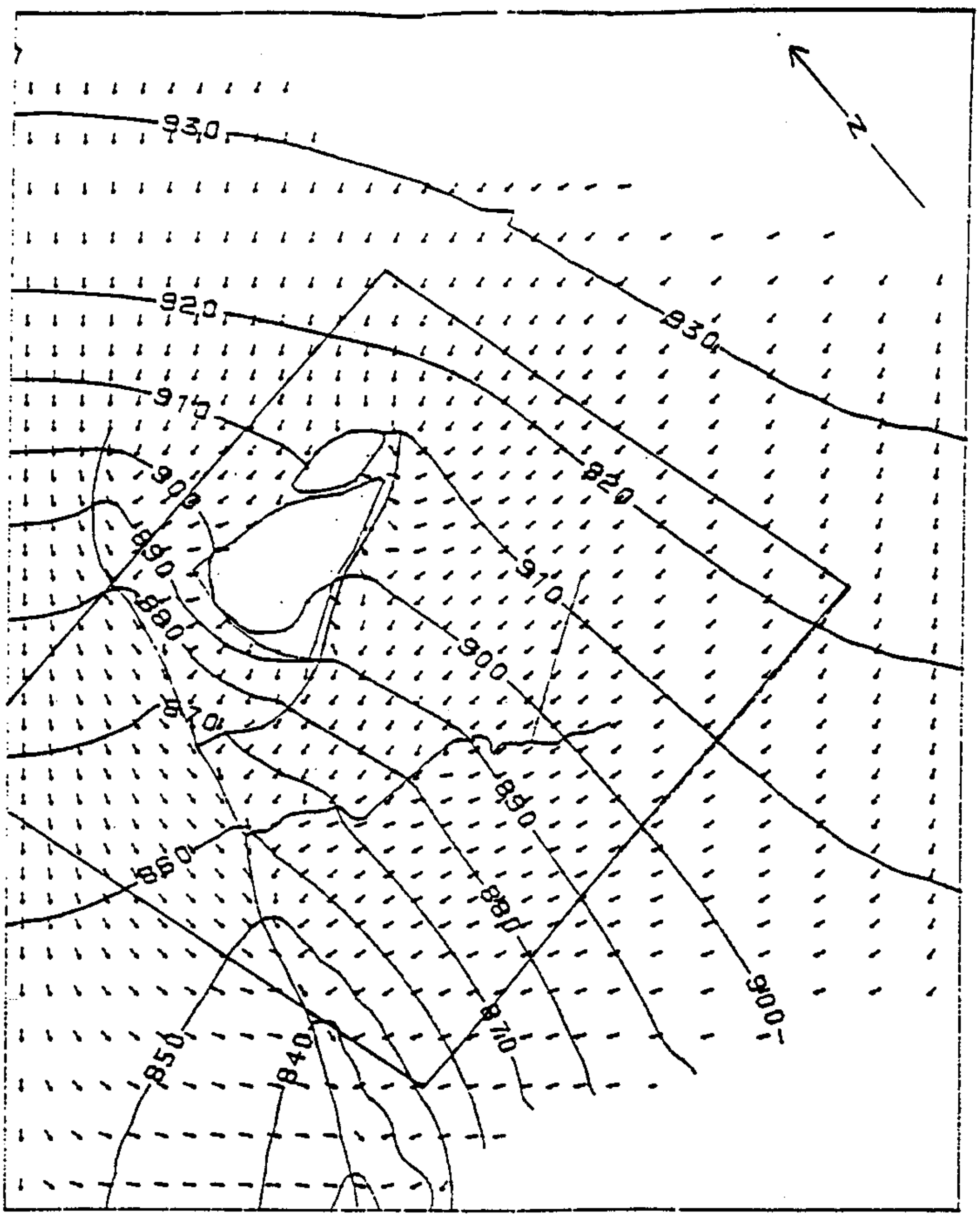

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Figure F-5: Simulated water levels in the regional aquifer.

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4.0 LOCAL FLOW SYSTEM

The local scale flow model is conceptualized as an anisotropic, three-dimensional water table aquifer. From observed water level patterns, the flow directions and water table elevations are influenced primarily by the onsite ponds and area streams. Additionally, variations in aquifer thickness due to undulating bedrock topography, together with preferential flow along geologic strike, are also thought to be factors affecting ground water flow. The domain of the local scale system is designed so that these controlling features are represented in the model. The domain includes the two onsite ponds, Mineral Springs Branch, West Washington Creek, and the onsite drainage ditch. Their finite-difference representations are shown in Figure F-6. The local finite-difference grid is composed of 53 by 43 cells in plan view. Aerially, the grid spacing varies from 20 feet, where high resolution is required, to 160 feet in less critical areas.

Vertically, three equally spaced layers of cells are used to represent the saturated thickness of the saprolite aquifer. The base of the model is considered to be the local bedrock surface, which is shown in Figure F-7. The top of the model is the approximate water table surface, rather than the actual land elevation. The reason for this is so that the model could be run in a confined-aquifer mode (i.e., where water level elevations are at or above the top of the aquifer) and still approximate an unconfined system. Operating the model in an unconfined mode proved too time-consuming due to the extra iterations required for dewatering/aquifer-thickness corrections. The top of the model, then, was defined through successive model runs and using computed water level elevations as the top of the aquifer for the next set of simulations. In another time-saving effort, preliminary developmental runs were often performed using a two dimensional (one layer) representation of the system, reserving the three dimensional simulation for when the characteristics of the system were better defined.

Calibration was performed again at the local scale. A value of rainfall/recharge of four inches per year, as with the regional model, was found to produce the best results. For the local model the effects of anisotropic permeability were also investigated. Anisotropy was assumed to occur along the grid axes, which were originally set up to coincide with the average geologic strike of the site area. The strongest permeability components were assigned along the model's y-axis, or along the geologic strike, and the z-axis, which represents preferential vertical flow along the geologic dip. The least strongest component was given along the x-axis to produce less flow perpendicular to foliation within the saprolite.

Observed contamination patterns at the site, which act as a ground water tracer, show some slight evidence of preferential flow along geologic layerings. Careful comparison of concentration contour maps with the direction of ground water flow predicted from the observed water levels suggests a small preferential transport component to the south, which we interpret as being produced by foliation in the saprolite. Several model runs were performed with varying anisotropy ratios to examine this potential effect.

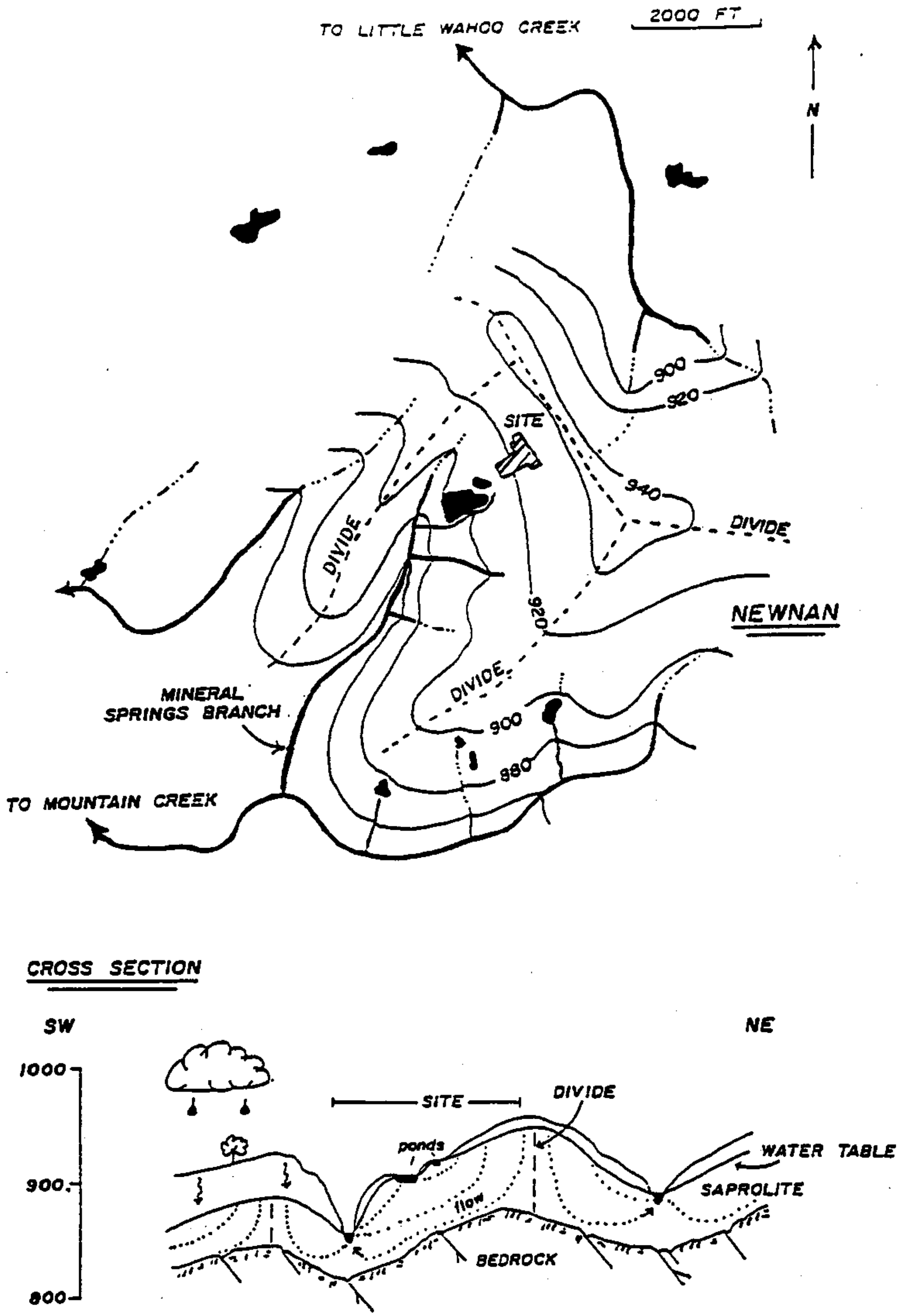

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Figure F-3: Regional hydrogeologic boundaries and approximate water levels.

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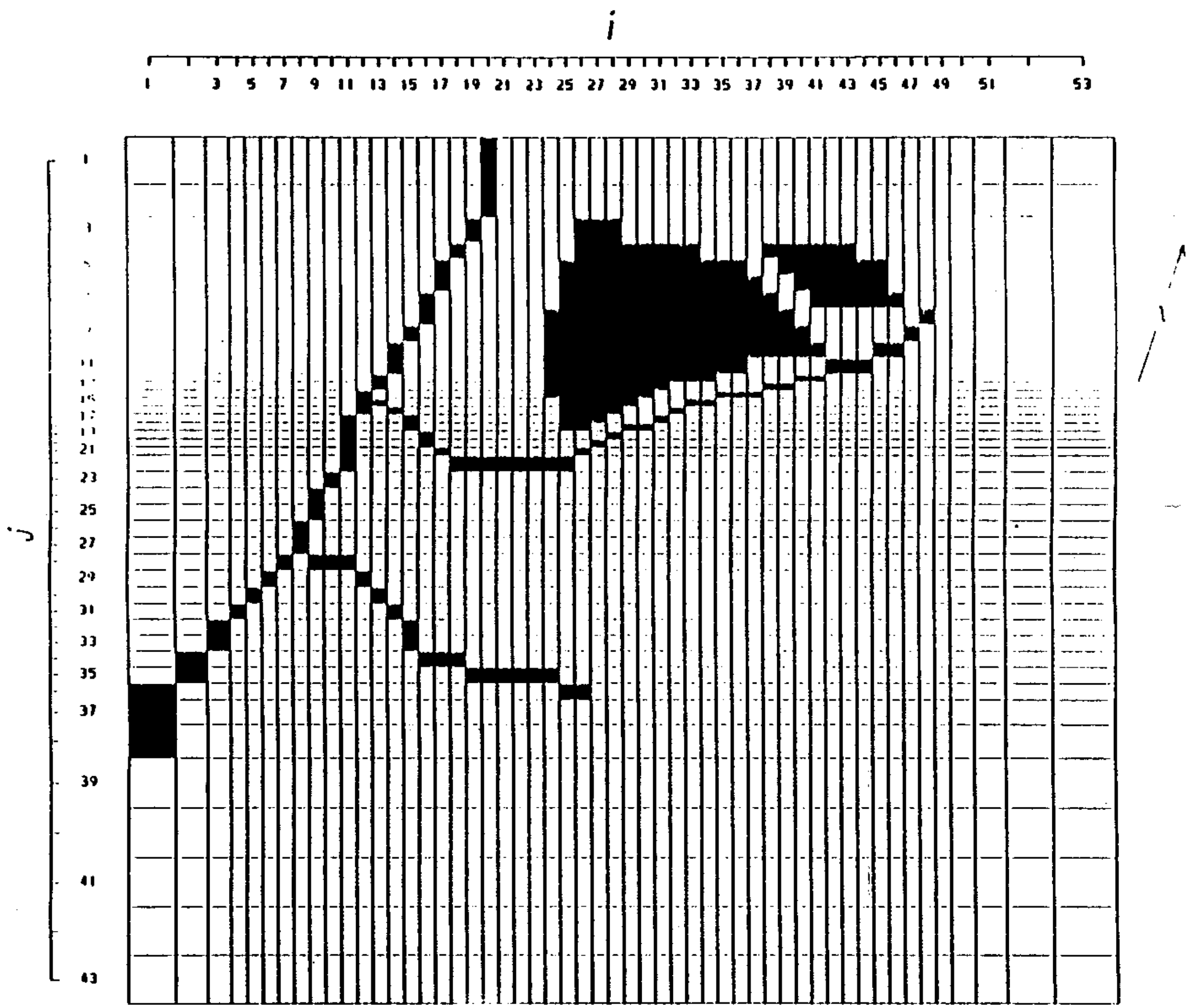

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Figure F-6: Local-scale finite-difference grid.

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Simulations performed with anisotropy ratios higher than about 10:1, however, produced an extreme directionality not observed in the site data. A review of the trial runs showed that a ratio of 2:1 gave the "best" results, producing the slight amount of preferential movement desired. We note that this ratio is not as high as we might expect for Piedmont saprolite. The final computed water levels and the predicted flow directions are shown in Figure F-8. Agreement with observed water level data is good.

5.0 TRANSPORT SYSTEM

At the local scale, transport simulations were performed to assess contaminant transport eight years into the future if no remedial action is taken at the site. Since only limited knowledge exists on the history and amount of PCE released into ground water, a simulation of the actual contamination event, and a reproduction of the present day concentrations (history matching), could not be accomplished. This lack of source definition is common at similar sites. Instead, from the existing shallow and deep contours of PCE, observed concentrations were assigned to the appropriate cells of the model, thereby initializing the model to represent present-day contaminant patterns. The shallow PCE data were assigned to the upper model layer and the deep data were assigned to the lower two model layers. From this process the total mass of PCE in ground water was found to be only about 25 pounds.

The transport of volatile organics in ground water is controlled by convection (movement with the ground water), hydrodynamic dispersion, adsorption to the soils (retardation), and molecular diffusion. In this analysis the calculated flow velocities from the local-scale model provided the convection term. For dispersion, a single value of 50 feet was considered. This value is somewhat higher but generally consistent with field-determined estimates in similar materials. The effects of adsorption and diffusion were not investigated. In assigning transport parameters such as dispersion, we elected to use values that have the effect of producing an overall conservative analysis in terms of environmental protection, or one that would not underestimate the degree of contaminant movement.

The solution of the concentration equation as implemented within the SWIFT III model is limited by certain numerical constraints. For instance, given a particular grid spacing and velocity term, time steps that are too large or dispersion values that are too low can produce errors in the concentrations determined. The limiting values that can be used are easily determined, however. For the local model it was found that maximum time step allowed is 60 days and the minimum dispersion varied between about 20 to 40 feet. Times steps of 30 days and a dispersion value of 50 feet were ultimately selected for the local simulations. Modeling transport over an eight year period, in 30 day increments, therefore required 97 separate iterations.

Model output (shown in the main body of the report) shows the effects of convection (a few tens of feet per year) along the main flow direction and a lateral spreading. The latter is the result of both dispersion and as the result of preferential flow (anisotropy) along the geologic strike.

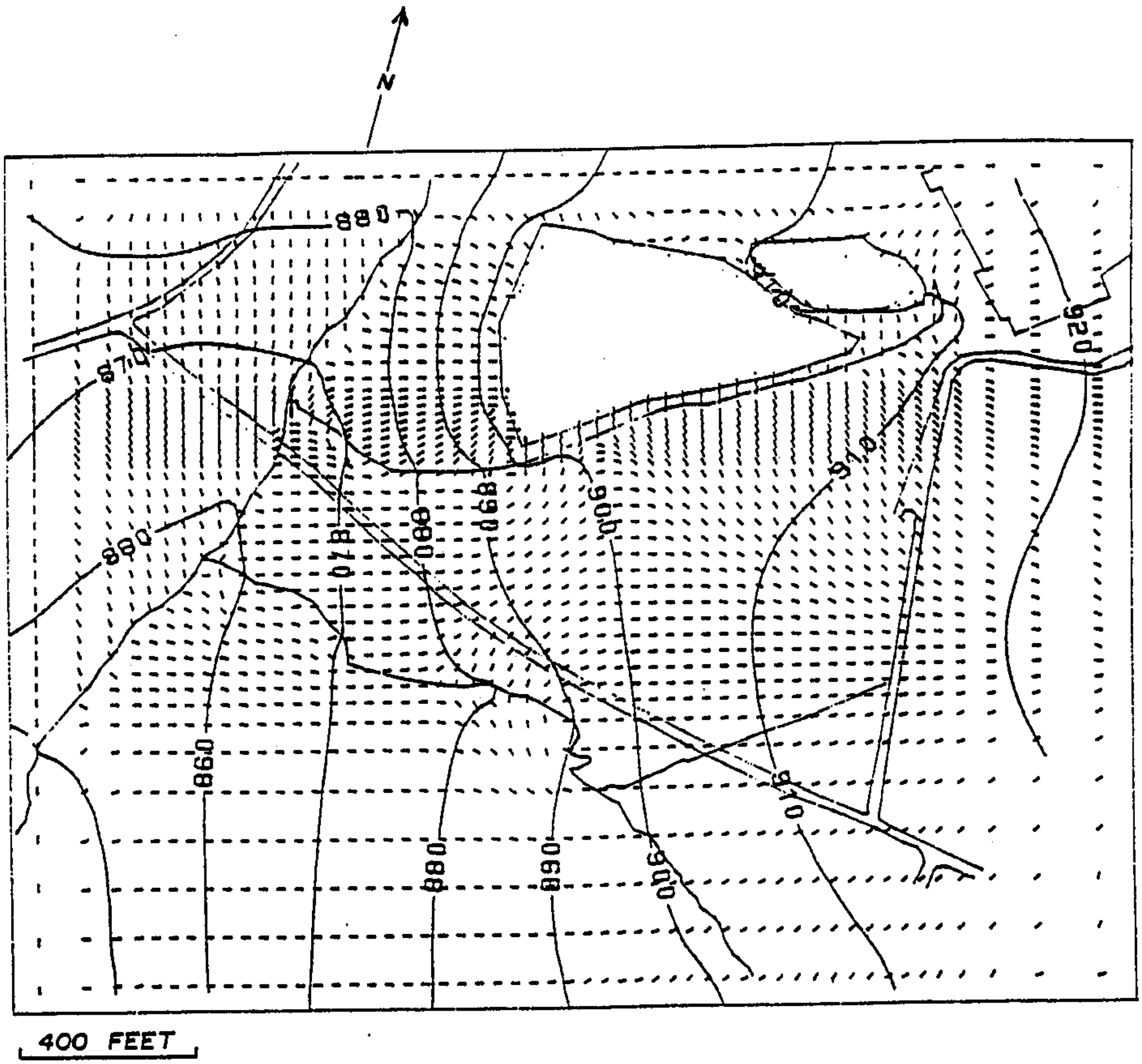

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Figure F-8: Simulated water levels in the local area saprolite.

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6.0 CAPABILITIES FOR FUTURE INVESTIGATIONS

The local scale flow and transport model is capable of simulating a variety of remedial scenarios, including the removal through time of PCE due to the operation of interceptor wells. Any arrangement of remedial wells can be simulated. Once a number of such runs have been performed, an optimum number and arrangement of wells can be selected. Importantly, this process can help establish a cleanup level for the site that is based on cost effectiveness. PCE concentrations within removed water can also be estimated, thereby defining the requirements of any treatment system designed for the site.

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APPENDIX C

MODFLOW Model Description

A MODULAR THREE-DIMENSIONAL FINITE-DIFFERENCE GROUND-WATER FLOW MODEL

By Michael G. McDonald and Arlen W. Harbaugh

ABSTRACT

This report presents a finite-difference model and its associated modular computer program. The model simulates flow in three dimensions. The report includes detailed explanations of physical and mathematical concepts on which the model is based and an explanation of how those concepts are incorporated in the modular structure of the computer program. The modular structure consists of a Main Program and a series of highly independent subroutines called "modules." The modules are grouped into "packages." Each package deals with a specific feature of the hydrologic system which is to be simulated, such as flow from rivers or flow into drains, or with a specific method of solving linear equations which describe the flow system, such as the Strongly Implicit Procedure or Slice-Successive Overrelaxation.

The division of the program into modules permits the user to examine specific hydrologic features of the model independently. This also facilitates development of additional capabilities because new packages can be added to the program without modifying the existing packages. The input and output systems of the computer program are also designed to permit maximum flexibility.

Ground-water flow within the aquifer is simulated using a block-centered finite-difference approach. Layers can be simulated as confined, unconfined, or a combination of confined and unconfined. Flow associated with external stresses, such as wells, areal recharge, evapotranspiration, drains, and streams, can also be simulated. The finite-difference equations can be solved using either the Strongly Implicit Procedure or Slice-Successive Overrelaxation.

The program is written in FORTRAN 77 and will run without modification on most computers that have a FORTRAN 77 compiler. For each program module, this report includes a narrative description, a flow chart, a list of variables, and a module listing.

CHAPTER 1

INTRODUCTION

Purpose

Since their inception, the two- and three-dimensional finite-difference models described by Trescott (1975), Trescott and Larson (1976), and Trescott, Pinder, and Larson (1976) have been used extensively by the U.S. Geological Survey and others for the computer simulation of ground-water flow. The basic concepts embodied in those models have been incorporated in the model presented here. The primary objectives in designing a new ground-water flow model were to produce a program that could be readily modified, was simple to use and maintain, could be executed on a variety of computers with minimal changes, and was relatively efficient with respect to computer memory and execution time.

The model program documented in this report uses a modular structure wherein similar program functions are grouped together, and specific computational and hydrologic options are constructed in such a manner that each option is independent of other options. Because of this structure, new options can be added without the necessity of changing existing subroutines. In addition, subroutines pertaining to options that are not being used can be deleted, thereby reducing the size of the program. The model may be used for either two- or three-dimensional applications. Input procedures have been generalized so that each type of model input data may be stored and read from separate external files. Variable formatting allows input data arrays to be read in any format without modification to the program. The type of output that is available has also been generalized so that the user may select various model output options to suit a particular need. The program was originally written using FORTRAN 66 (McDonald and Harbaugh, 1984). It has subsequently been modified to use FORTRAN 77. This report documents the FORTRAN 77 version. The program is highly portable; it will run, without modification, on most computers. On some computers, minor modification may be necessary or desirable. A discussion about program portability is contained in Appendix A.

The major options that are presently available include procedures to simulate the effects of wells, recharge, rivers, drains, evapotranspiration, and "general-head boundaries". The solution algorithms available include two iteration techniques, the Strongly Implicit Procedure (SIP) and the Slice-Successive Overrelaxation method (SSOR).

Organization of This Report

The purpose of this report is to describe the mathematical concepts used in this program, the design of the program, and the input needed to use the program. The program has been divided into a main program and a series of highly independent subroutines called modules. The modules, in turn, have been grouped into "packages." A package is a group of modules that deals with a single aspect of the simulation. For example, the Well Package simulates the effect of wells, the River Package simulates the effect of rivers, and the SIP Package solves a system of equations using the Strongly Implicit Procedure. Many of the packages represent options which the user may or may not have occasion to use. Each of the packages is described in a separate chapter of this report. Two preliminary chapters describe topics relating to the overall program; Chapter 2 derives the finite-difference equation that is used in the model and Chapter 3 describes the overall design of the program. Chapter 14 describes utility modules that are used by various packages to perform special tasks. Appendices A-E cover topics relating to the operation of the model.

Chapters 4 through 13 describe individual packages. The description of each package consists of (1) a section entitled "Conceptualization and Implementation," (2) input instructions for the package, and (3) documentation of the individual modules contained in the package. The Conceptualization and Implemementation section describes the physical and mathematical concepts used to build the package. For example, in the chapter describing the River Package, an equation is derived which approximates flow through a riverbed, and a discussion is provided to show how that equation can be incorporated into the finite-difference equation. Chapters 12 and 13 describe the solution procedures currently available in the model.

The input instructions in Chapters 4 through 13 are presented in terms of input "items." An item of input may be a single record or a collection of similar records, or it may be an array or a collection of arrays.(In the model described herein, three-dimensional arrays are always read as a collection of two-dimensional arrays, one associated with each model layer.) The input section in each chapter presents a list of the input items associated with the package described in that chapter; the entries in this list are numbered, and generally consist of two lines (sometimes followed by a note or comment). For items which consist of a single record or a group of similar records, the first line in the entry gives the names of the fields comprising the records, while the second line shows the format of those fields, in standard FORTRAN notation. For an input item which consists of an array, the first line of the entry gives the name of the array, while the second line gives the name of the utility module which reads the array. Further details concerning utility modules are provided in Chapter 14.

For most of the packages, the list of input items is subdivided into two major sections. One of these falls under the heading "FOR EACH SIMULATION" and includes all items for which only one entry is needed in each simulation; the other falls under the heading "FOR EACH STRESS PERIOD", and includes those items for which several entries may be needed in each simulation (for example, pumping rate, which may change with time during the period represented in a simulation). These major sections of the input list are further subdivided by headings which indicate the modules (subroutines) which read the item, or, in the case of an array, which call a utility subroutine to read the array. Input items that are printed entirely in capital letters are used as FORTRAN variables or arrays in the model program; input items which appear in mixed upper and lower case print are terms used in the instructions to describe the input fields or procedures, and do not appear in the model itself as FORTRAN variables. Chapter 4, which describes the Basic Package, includes two lists of input items; one of these describes input which is always required, while the other describes input associated with the optional "output control" section of the Basic Package.

An explanation of input fields is presented following the list of input items in Chapters 4 through 13. This explanation is followed in most cases by a sample input for the package under consideration. In Chapter 4, again, the input items associated with the output control option are treated separately; thus an independent explanation of fields and sample input are provided for output control.

In each simulation, the user must designate which of the options of the program are to be utilized, and must indicate the file from which the input for each option is to be read. This is done through a one-dimensional array, IUNIT; the entries in this array are the unit numbers associated with the required files by the computer operating system. A location in the IUNIT array is given at the beginning of the input sections in Chapters 5 through 13, and at the beginning of the input discussion for "output control" in Chapter 4. If the option is to be utilized, the user must enter, in the designated IUNIT array location, the unit number of the file or channel through which input for the option is to be read; if the option is not required a zero is entered in this location. Further discussion of the IUNIT array is provided in Chapters 3 and 4.

Following the input section in Chapters 4 through 13, each chapter provides a documentation of the modules making up the associated package. This documentation consists of a list of the modules in the package, followed by detailed descriptions of each of the modules. The detailed description of a module generally contains four documents: (1) a narrative description of the module, (2) a flow chart of the module, (3) a FORTRAN listing of the module, and (4) a list of the variable names which are used in the module. For very simple modules, the flow chart is omitted. The narrative description is a numbered list of the functions performed by the module showing the order in which they are performed. The flow chart is a graphic equivalent of the narrative. The blocks in the flow chart are numbered with the same numbers used in the narrative so that the two documents can be cross referenced. An explanation of terms used in the flow chart is contained on the sheet with the flow chart. The program listing contains comments with numbers corresponding to those used in the flow charts and the narratives. The fourth record of the listing contains a comment showing the time and day that the module was last modified. The list of variables shows the name, range, and definition of every variable used in the module. If the variable is used only in that module, its range is given as "Module"; if it is used in other modules of the package, but not outside the package, its range is given as "Package"; if it is used in the modules of more than one package, its range is given as "Global."

To summarize the organization of this report, Chapters 2 and 3, and the "Conceptualization and Implementation" section of Chapter 4, provide discussions relevant to the overall design and functioning of the program; the formulation of coefficients representing flow within the aquifer is discussed under "Conceptualization and Implementation" in Chapter 5; Chapters 6 through 11 provide discussions of particular external sources or sinks and their representation in the model; and Chapters 12 and 13 discuss the operation of particular solvers for the systems of finite difference equations generated in the model. Input instructions for each package are provided in the relevant chapter; a discussion of input for utility modules is provided in Chapter 14. The appendices provide a sample problem, abbreviated input instructions, and discussions of certain computer-related topics.

Acknowledgement

The authors wish to extend special thanks to Gordon Bennett. In addition to providing the administrative support for the model development, he provided encouragement and guidance along the way. His critical review of the report greatly improved its clarity.

CHAPTER 2

DERIVATION OF THE FINITE-DIFFERENCE EQUATION

Mathematical Model

The three-dimensional movement of ground water of constant density through porous earth material may be described by the partial-differential equation

$$\frac{\partial}{\partial x}\left(K_{xx}\frac{\partial h}{\partial x}\right) + \frac{\partial}{\partial y}\left(K_{yy}\frac{\partial h}{\partial y}\right) + \frac{\partial}{\partial z}\left(K_{zz}\frac{\partial h}{\partial z}\right) - W = S_s\frac{\partial h}{\partial t} \qquad (1)$$

where

K_{xx}, K_{yy} and K_{zz} are values of hydraulic conductivity along the x, y, and z coordinate axes, which are assumed to be parallel to the major axes of hydraulic conductivity (Lt^{-1});

h is the potentiometric head (L);

W is a volumetric flux per unit volume and represents sources and/or sinks of water (t^{-1});

S_s is the specific storage of the porous material (L^{-1}); and

t is time (t).

For a derivation of equation (1) see for example Rushton and Redshaw (1979). In general, S_s, K_{xx}, K_{yy}, and K_{zz} may be functions of space ($S_s = S_s(x,y,z)$, $K_{xx} = K_{xx}(x,y,z)$, etc.) and W may be a function of space and time ($W = W(x,y,z,t)$); equation (1) describes ground-water flow under nonequilibrium conditions in a heterogeneous and anisotropic medium, provided the principal axes of hydraulic conductivity are aligned with the coordinate directions.

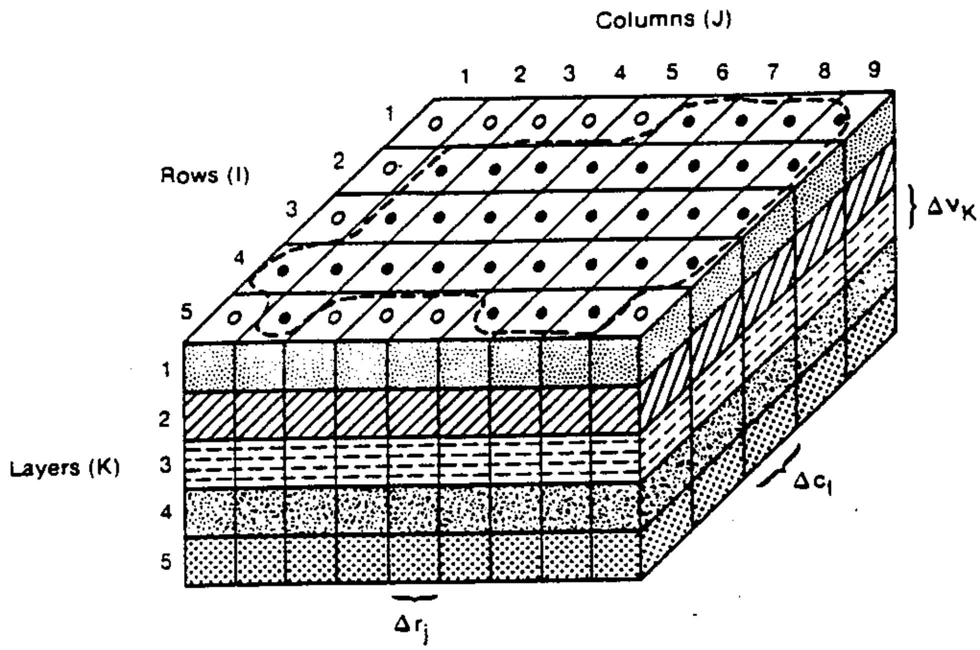
Equation (1), together with specification of flow and/or head conditions at the boundaries of an aquifer system and specification of initial-head conditions, constitutes a mathematical representation of a ground-water flow system. A solution of equation (1), in an analytical sense, is an algebraic expression giving $h(x,y,z,t)$ such that, when the derivatives of h with respect to space and time are substituted into equation (1), the equation and its initial and boundary conditions are satisfied. A time-varying head distribution of this nature characterizes the flow system, in that it measures both the energy of flow and the volume of water in storage, and can be used to calculate directions and rates of movement.

Except for very simple systems, analytical solutions of equation (1) are rarely possible, so various numerical methods must be employed to obtain approximate solutions. One such approach is the finite-difference method, wherein the continuous system described by equation (1) is replaced by a finite set of discrete points in space and time, and the partial derivatives are replaced by terms calculated from the differences in head values at these points. The process leads to systems of simultaneous linear algebraic difference equations; their solution yields values of head at specific points and times. These values constitute an approximation to the time-varying head distribution that would be given by an analytical solution of the partial-differential equation of flow.

The finite-difference analog of equation (1) may be derived by applying the rules of difference calculus; however, in the discussion presented here, an alternative approach is used with the aim of simplifying the mathematical treatment and explaining the computational procedure in terms of familiar physical concepts regarding the flow system.

Discretization Convention

Figure 1 shows a spatial discretization of an aquifer system with a mesh of blocks called cells, the locations of which are described in terms of rows, columns, and layers. An i,j,k indexing system is used. For a system



Explanation

---- Aquifer Boundary

● Active Cell

o Inactive Cell

Δr_J Dimension of Cell Along the Row Direction. Subscript (J) Indicates the Number of the Column

Δc_I Dimension of Cell Along the Column Direction. Subscript (I) Indicates the Number of the Row

Δv_K Dimension of the Cell Along the Vertical Direction. Subscript (K) Indicates the Number of the Layer

Figure 1.—A discretized hypothetical aquifer system.

consisting of "nrow" rows, "ncol" columns, and "nlay" layers, i is the row index, i = 1,2,. . . nrow; j is the column index, j = 1,2,. . . ncol; and k is the layer index, k = 1,2,. . . nlay. For example, figure 1 shows a system with nrow = 5, ncol = 9, and nlay = 5. In formulating the equations of the model, an assumption was made that layers would generally correspond to horizontal geohydrologic units or intervals. Thus in terms of Cartesian coordinates, the k index denotes changes along the vertical, z; because the convention followed in this model is to number layers from the top down, an increment in the k index corresponds to a decrease in elevation. Similarly rows would be considered parallel to the x axis, so that increments in the row index, i, would correspond to decreases in y; and columns would be considered parallel to the y axis, so that increments in the column index, j, would correspond to increases in x. These conventions were followed in constructing figure 1; however, applications of the model requires only that rows and columns fall along consistent orthogonal directions within the layers, and does not require the designation of x, y, or z coordinate axes.

Following the conventions used in figure 1, the width of cells in the row direction, at a given column, j, is designated Δr_j; the width of cells in the column direction at a given row, i, is designated Δc_i; and the thickness of cells in a given layer, k, is designated Δv_k. Thus a cell with coordinates (i,j,k) = (4,8,3) has a volume of $\Delta r_8 \Delta c_4 \Delta v_3$.

Within each cell there is a point called a "node" at which head is to be calculated. Figure 2 illustrates, in two dimensions, two conventions for defining the configuration of cells with respect to the location of nodes--the block-centered formulation and the point-centered formulation. Both systems start by dividing the aquifer with two sets of parallel lines which are orthogonal. In the block-centered formulation, the blocks formed by the sets of parallel lines are the cells; the nodes are at the center of the cells. In the point-centered formulation, the nodes are at the intersection points of the sets of parallel lines, and cells are drawn around the nodes with faces halfway between nodes. In either case, spacing of nodes should be chosen so that the hydraulic properties of the system are, in fact, generally uniform over the extent of a cell. The finite-difference equation developed in the following section holds for either formulation; however, only the block-centered formulation is presently used in the model.

In equation (1), the head, h, is a function of time as well as space so that, in the finite-difference formulation, discretization of the continuous time domain is also required.

Finite-Difference Equation

Development of the ground-water flow equation in finite-difference form follows from the application of the continuity equation: the sum of all flows into and out of the cell must be equal to the rate of change in storage within the cell. Under the assumption that the density of ground water is constant, the continuity equation expressing the balance of flow for a cell is

$$\Sigma Q_i = SS\frac{\Delta h}{\Delta t}\Delta V \qquad (2)$$

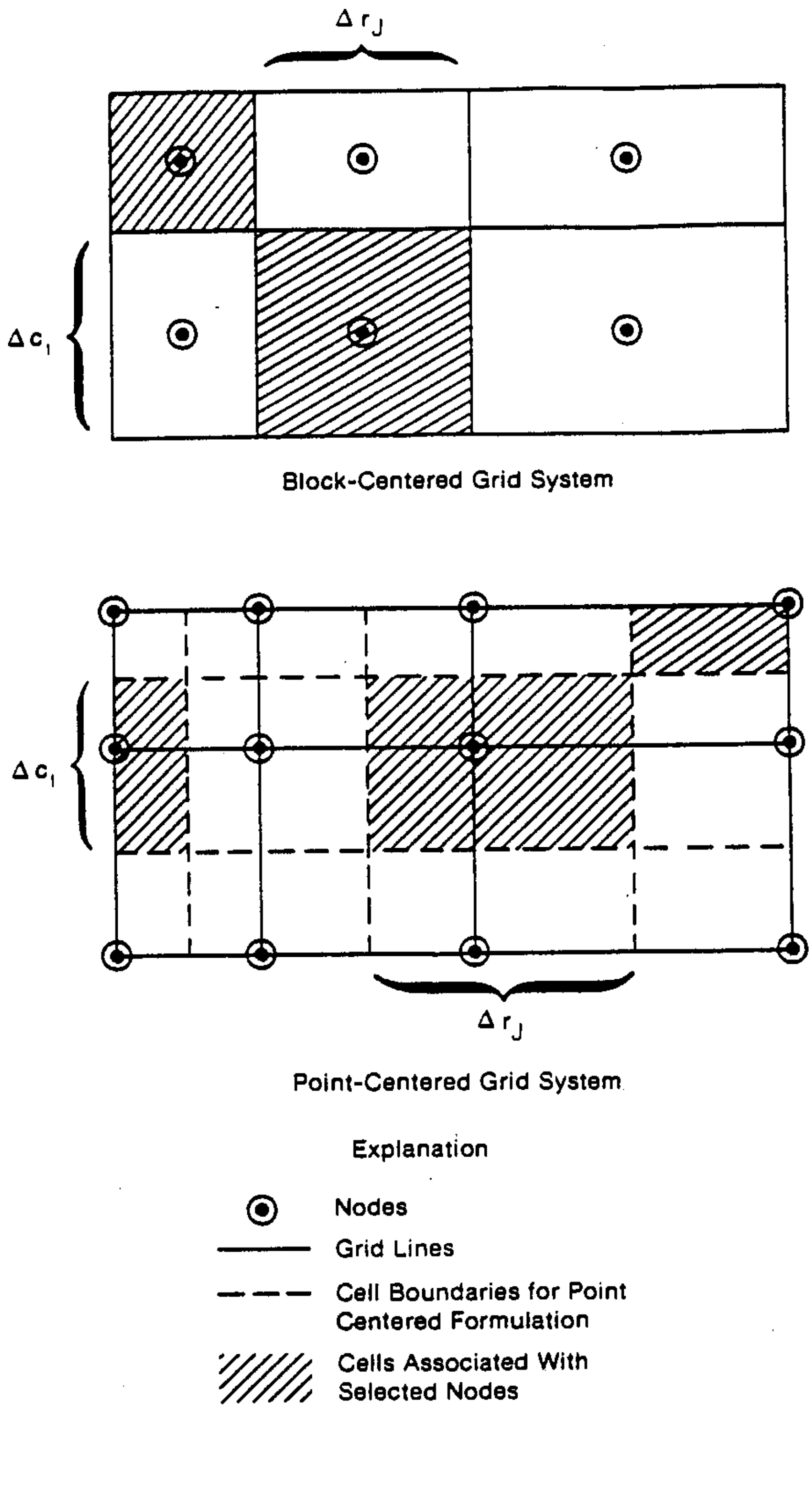


Figure 2.—Grids showing the difference between block-centered and point-centered grids.

where

Q_i is a flow rate into the cell (L^3t^{-1});

SS has been introduced as the notation for specific storage in the finite-difference formulation; its definition is equivalent to that of S_s in equation (1)--i.e., it is the volume of water which can be injected per unit volume of aquifer material per unit change in head (L^{-1});

ΔV is the volume of the cell (L^3); and

Δh is the change in head over a time interval of length Δt.

The term on the right hand side is equivalent to the volume of water taken into storage over a time interval Δt given a change in head of Δh. Equation (2) is stated in terms of inflow and storage gain. Outflow and loss are represented by defining outflow as negative inflow and loss as negative gain.

Figure 3 depicts a cell i,j,k and six adjacent aquifer cells i-1,j,k; i+1,j,k; i,j-1,k; i,j+1,k; i,j,k-1; and i,j,k+1. To simplify the following development, flows are considered positive if they are entering cell i,j,k; and the negative sign usually incorporated in Darcy's law has been dropped from all terms. Following these conventions, flow into cell i,j,k in the row direction from cell i,j-1,k (figure 4), is given by Darcy's law as

$$q_{i,j-1/2,k} = KR_{i,j-1/2,k}\Delta c_i \Delta v_k \frac{(h_{i,j-1,k} - h_{i,j,k})}{\Delta r_{j-1/2}} \qquad (3)$$

where

$h_{i,j,k}$ is the head at node i,j,k, and $h_{i,j-1,k}$ that at node i,j-1,k;

$q_{i,j-1/2,k}$ is the volumetric fluid discharge through the face between cells i,j,k and i,j-1,k (L^3t^{-1});

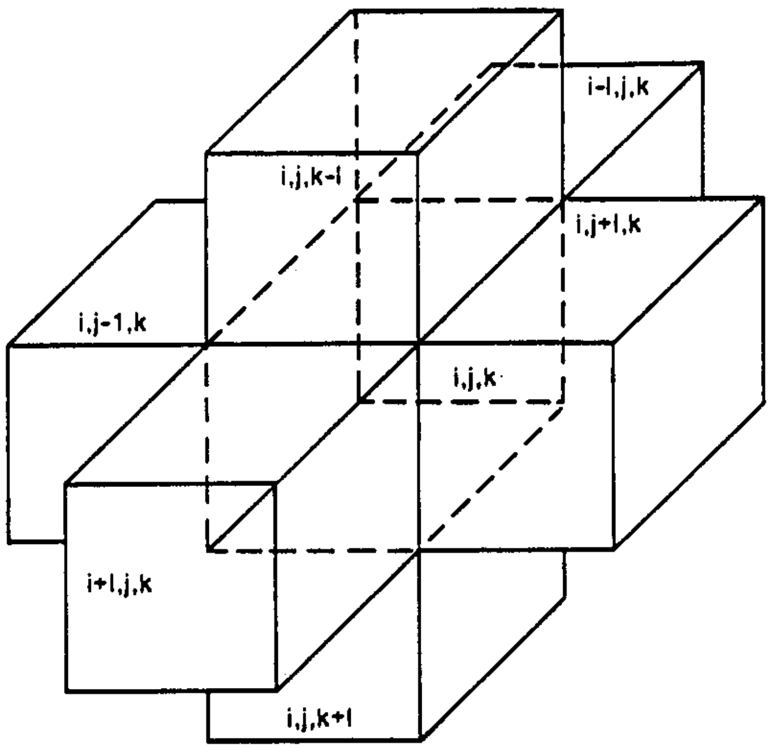


Figure 3.—Cell i,j,k and indices for the six adjacent cells.

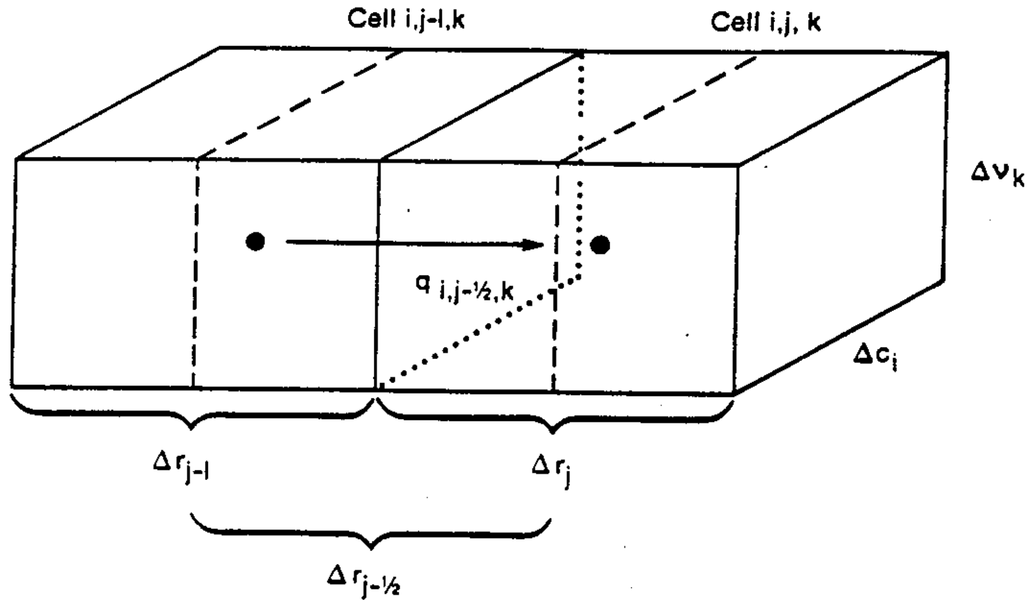


Figure 4.—Flow into cell i,j,k from cell i,j-l,k.

$KR_{i,j-1/2,k}$ is the hydraulic conductivity along the row between nodes i,j,k and $i,j-1,k$ (Lt^{-1});

$\Delta c_i \Delta v_k$ is the area of the cell faces normal to the row direction; and

$\Delta r_{j-1/2}$ is the distance between nodes i,j,k and $i,j-1,k$ (L).

Although the discussion is phrased in terms of flow into the central cell, it can be misleading to associate the subscript $j-1/2$ of equation (3) with a specific point between the nodes. Rather, the term $KR_{i,j-1/2,k}$ of equation (3) is the effective hydraulic conductivity for the entire region between the nodes, normally calculated as a harmonic mean in the sense described by, for example, Collins (1961). If this is done, equation (3) gives the exact flow, for a one-dimensional steady-state case, through a block of aquifer extending from node $i,j-1,k$ to node i,j,k and having a cross sectional area $\Delta c_i \Delta v_k$.

Similar expressions can be written approximating the flow into the cell through the remaining five faces, i.e., for flow in the row direction through the face between cells i,j,k and $i,j+1,k$,

$$q_{i,j+1/2,k} = KR_{i,j+1/2,k} \Delta c_i \Delta v_k \frac{(h_{i,j+1,k} - h_{i,j,k})}{\Delta r_{j+1/2}} \tag{4}$$

while for the column direction, flow into the block through the forward face is

$$q_{i+1/2,j,k} = KC_{i+1/2,j,k} \Delta r_j \Delta v_k \frac{(h_{i+1,j,k} - h_{i,j,k})}{\Delta c_{i+1/2}} \tag{5}$$

and flow into the block through the rear face is

$$q_{i-1/2,j,k} = KC_{i-1/2,j,k} \Delta r_j \Delta v_k \frac{(h_{i-1,j,k} - h_{i,j,k})}{\Delta c_{i-1/2}}. \tag{6}$$

For the vertical direction, inflow through the bottom face is

$$q_{i,j,k+1/2} = KV_{i,j,k+1/2} \Delta r_j \Delta c_i \frac{(h_{i,j,k+1} - h_{i,j,k})}{\Delta v_{k+1/2}} \qquad (7)$$

while inflow through the upper face is given by

$$q_{i,j,k-1/2} = KV_{i,j,k-1/2} \Delta r_j \Delta c_i \frac{(h_{i,j,k-1} - h_{i,j,k})}{\Delta v_{k-1/2}} . \qquad (8)$$

Each of equations (3)-(8) expresses inflow through a face of cell i,j,k in terms of heads, grid dimensions, and hydraulic conductivity. The notation can be simplified by combining grid dimensions and hydraulic conductivity into a single constant, the "hydraulic conductance" or, more simply, the "conductance." For example,

$$CR_{i,j-1/2,k} = KR_{i,j-1/2,k} \Delta c_i \Delta v_k / \Delta r_{j-1/2} \qquad (9)$$

where

$CR_{i,j-1/2,k}$ is the conductance in row i and layer k between nodes i,j-1,k and i,j,k (L^2t^{-1}).

Conductance is thus the product of hydraulic conductivity and cross-sectional area of flow divided by the length of the flow path (in this case, the distance between the nodes.)

Substituting conductance from equation (9) into equation (3) yields

$$q_{i,j-1/2,k} = CR_{i,j-1/2,k}(h_{i,j-1,k} - h_{i,j,k}). \tag{10}$$

Similarly, equations (4)-(8) can be rewritten to yield

$$q_{i,j+1/2,k} = CR_{i,j+1/2,k}(h_{i,j+1,k} - h_{i,j,k}) \tag{11}$$

$$q_{i-1/2,j,k} = CC_{i-1/2,j,k}(h_{i-1,j,k} - h_{i,j,k}) \tag{12}$$

$$q_{i+1/2,j,k} = CC_{i+1/2,j,k}(h_{i+1,j,k} - h_{i,j,k}) \tag{13}$$

$$q_{i,j,k-1/2} = CV_{i,j,k-1/2}(h_{i,j,k-1} - h_{i,j,k}) \tag{14}$$

$$q_{i,j,k+1/2} = CV_{i,j,k+1/2}(h_{i,j,k+1} - h_{i,j,k}) \tag{15}$$

where the conductances are defined analogously to $CR_{i,j-1/2,k}$ in equation (9).

Equations (10)-(15) account for the flow into cell i,j,k from the six adjacent cells. To account for flows into the cell from features or processes external to the aquifer, such as streams, drains, areal recharge, evapotranspiration or wells, additional terms are required. These flows may be dependent on the head in the receiving cell but independent of all other heads in the aquifer, or they may be entirely independent of head in the receiving cell. Flow from outside the aquifer may be represented by the expression

$$a_{i,j,k,n} = p_{i,j,k,n}h_{i,j,k} + q_{i,j,k,n} \tag{16}$$

where

$a_{i,j,k,n}$ represents flow from the n^{th} external source into cell i,j,k (L^3t^{-1}), and $p_{i,j,k,n}$ and $q_{i,j,k,n}$ are constants ((L^2t^{-1}) and (L^3t^{-1}), respectively).

For example, suppose a cell is receiving flow from two sources, recharge from a well and seepage through a riverbed. For the first source (n=1), since the flow from the well is assumed to be independent of head, $p_{i,j,k,1}$ is zero and $q_{i,j,k,1}$ is the recharge rate for the well. In this case,

$$a_{i,j,k,1} = q_{i,j,k,1}. \tag{17}$$

For the second source (n=2), the assumption is made that the stream-aquifer interconnection can be treated as a simple conductance, so that the seepage is proportional to the head difference between the river stage and the head in cell i,j,k (figure 5); thus we have

$$a_{i,j,k,2} = CRIV_{i,j,k,2}(R_{i,j,k} - h_{i,j,k}) \tag{18}$$

where $R_{i,j,k}$ is the head in the river (L) and $CRIV_{i,j,k,2}$ is a conductance (L^2t^{-1}) controlling flow from the river into cell i,j,k. For example, in the situation shown schematically in figure 5, CRIV would be given as the product of the vertical hydraulic conductivity of the riverbed material and the area of the streambed as it crosses the cell, divided by the thickness of the streambed material. Equation (18) can be rewritten as

$$a_{i,j,k,2} = - CRIV_{i,j,k,2}h_{i,j,k} + CRIV_{i,j,k,2}R_{i,j,k}. \tag{19}$$

The negative conductance term, $-CRIV_{i,j,k,2}$ corresponds to $p_{i,j,k,2}$ of equation 16, while the term $CRIV_{i,j,k,2}R_{i,j,k}$ corresponds to $q_{i,j,k,2}$. Similarly, all other external sources or stresses can be represented by an expression of the form of equation 16. In general, if there are N external sources or stresses affecting a single cell, the combined flow is expressed by

$$QS_{i,j,k} = \sum_{n=1}^{N} a_{i,j,k,n} = \sum_{n=1}^{N} p_{i,j,k,n} \; h_{i,j,k} + \sum_{n=1}^{N} q_{i,j,k,n}. \tag{20}$$

Defining $P_{i,j,k}$ and $Q_{i,j,k}$ by the expressions

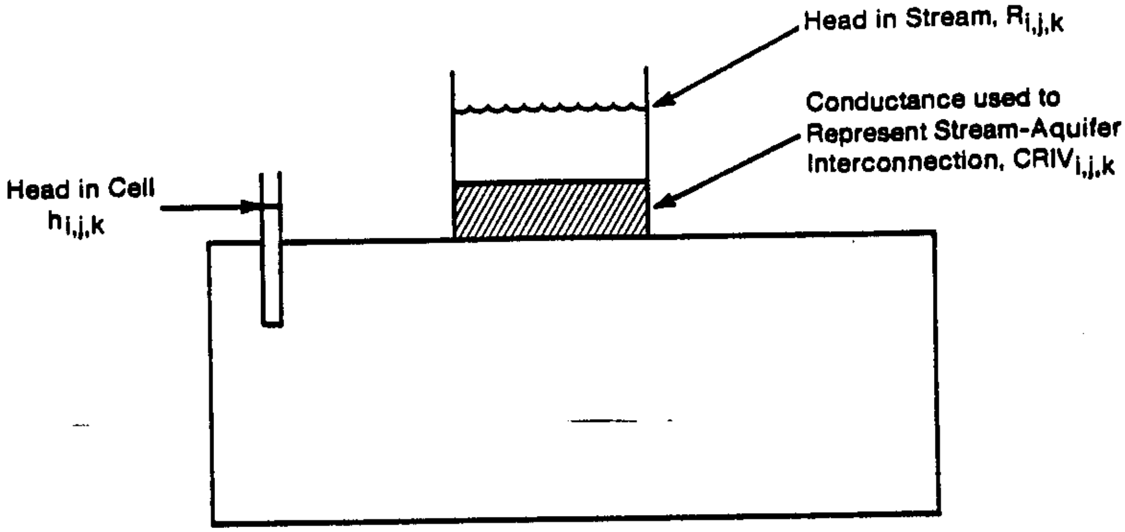


Figure 5.—Conceptual representation of leakage through a riverbed into a cell.

$$P_{i,j,k} = \sum_{n=1}^{N} p_{i,j,k,n} \text{ and}$$

$$Q_{i,j,k} = \sum_{n=1}^{N} q_{i,j,k,n},$$

the general external flow term for cell i,j,k is

$$QS_{i,j,k} = P_{i,j,k} h_{i,j,k} + Q_{i,j,k}. \qquad (21)$$

Applying the continuity equation (2) to cell i,j,k, taking into account the flows from the six adjacent cells, as well as the external flow rate, QS, yields

$$q_{i,j-1/2,k} + q_{i,j+1/2,k} + q_{i-1/2,j,k} + q_{i+1/2,j,k}$$

$$+ q_{i,j,k-1/2} + q_{i,j,k+1/2} + QS_{i,j,k} = SS_{i,j,k} \frac{\Delta h_{i,j,k}}{\Delta t} \Delta r_j \Delta c_i \Delta v_k \qquad (22)$$

where

$\frac{\Delta h_{i,j,k}}{\Delta t}$ is a finite-difference approximation for the derivative of head with respect to time (Lt^{-1});

$SS_{i,j,k}$ represents the specific storage of cell i,j,k (L^{-1}); and

$\Delta r_j \Delta c_i \Delta v_k$ is the volume of cell i,j,k (L^3).

Equations (10) through (15) and (21) may be substituted into equation (22) to give the finite-difference approximation for cell i,j,k as

$$CR_{i,j-1/2,k}(h_{i,j-1,k} - h_{i,j,k}) + CR_{i,j+1/2,k}(h_{i,j+1,k} - h_{i,j,k})$$
$$+ CC_{i-1/2,j,k}(h_{i-1,j,k} - h_{i,j,k}) + CC_{i+1/2,j,k}(h_{i+1,j,k} - h_{i,j,k})$$
$$+ CV_{i,j,k-1/2}(h_{i,j,k-1} - h_{i,j,k}) + CV_{i,j,k+1/2}(h_{i,j,k+1} - h_{i,j,k})$$
$$+ P_{i,j,k} h_{i,j,k} + Q_{i,j,k} = SS_{i,j,k}(\Delta r_j \Delta c_i \Delta v_k) \Delta h_{i,j,k} / \Delta t. \qquad (23)$$

The finite-difference approximation for the time derivative of head, $\frac{\Delta h_{i,j,k}}{\Delta t}$ must next be expressed in terms of specific heads and times. Figure 6 shows a hydrograph of head values at node i,j,k. Two values of time are shown on the horizontal axis: t_m, which is the time at which the flow terms of equation (23) are evaluated; and t_{m-1}, a time which precedes t_m. The head values at node i,j,k associated with these times are designated by superscript as $h^m_{i,j,k}$ and $h^{m-1}_{i,j,k}$, respectively. An approximation to the time derivative of head at time t_m is obtained by dividing the head difference $h^m_{i,j,k} - h^{m-1}_{i,j,k}$ by the time interval $t_m - t_{m-1}$; that is,

$$\left(\frac{\Delta h_{i,j,k}}{\Delta t}\right)_m \doteq \frac{h^m_{i,j,k} - h^{m-1}_{i,j,k}}{t_m - t_{m-1}}$$

Thus the hydrograph slope, or time derivative, is approximated using the change in head at the node over a time interval which precedes, and ends with, the time at which flow is evaluated. This is termed a backward-difference approach, in that $\Delta h/\Delta t$ is approximated over a time interval which extends backward in time from t_m, the time at which the flow terms are calculated. There are other ways in which $\Delta h/\Delta t$ could be approximated; for example, we could approximate it over a time interval which begins at the time of flow evaluation and extends to some later time; or over a time interval which is centered at the time of flow evaluation, extending both forward and backward from it. These alternatives, however, may cause numerical instability--that is, the growth or propagation of error during the calculation of heads at successive times in a simulation.

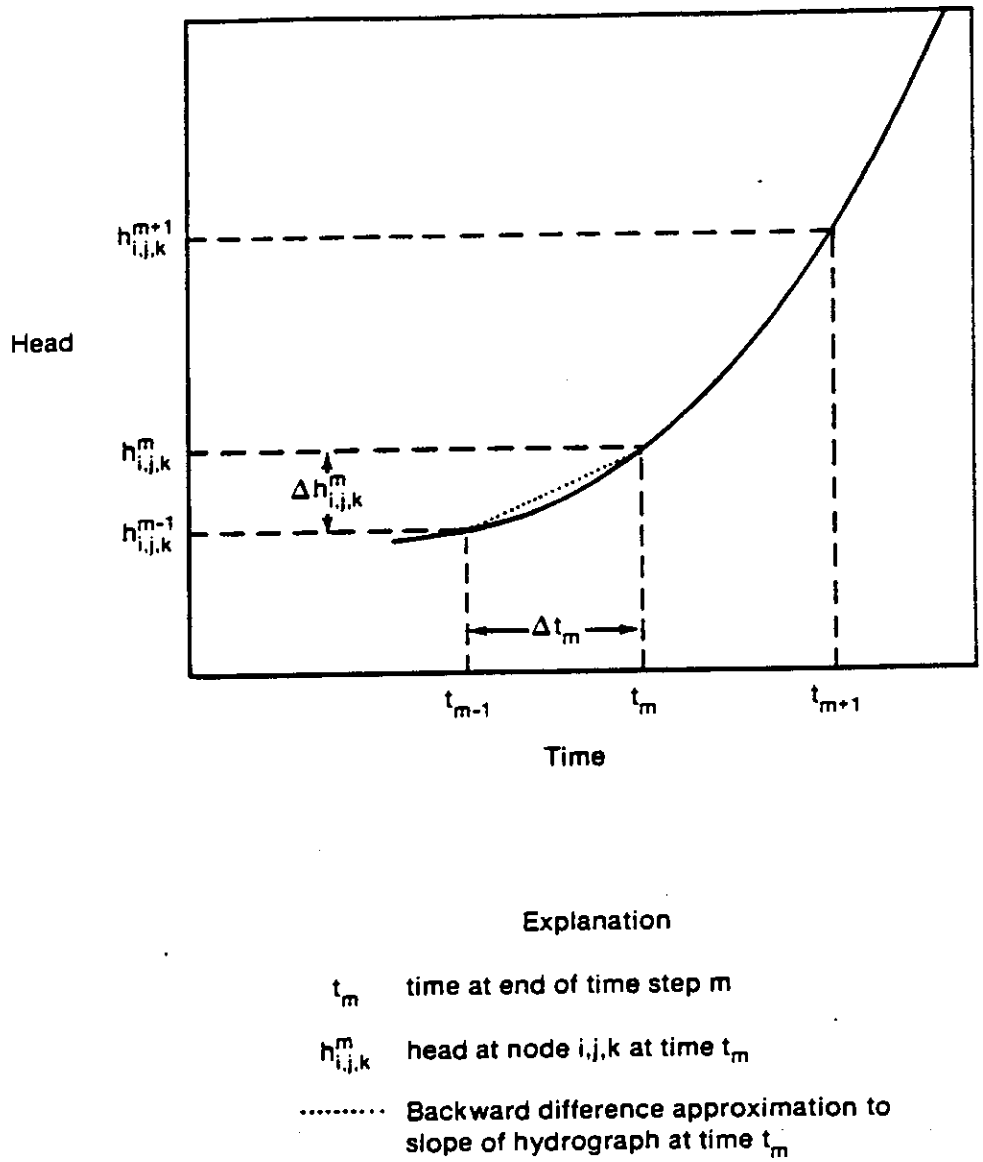


Figure 6.—Hydrograph for cell i,j,k.

In an unstable situation, errors which enter the calculation for any reason at a particular time will increase at each succeeding time as the calculation progresses, until finally they completely dominate the result. By contrast, the backward-difference approach is always numerically stable--that is, errors introduced at any time diminish progressively at succeeding times. For this reason, the backward-difference approach is preferred even though it leads to large systems of equations which must be solved simultaneously for each time at which heads are to be computed.

Equation (23) can be rewritten in backward-difference form by specifying flow terms at t_m, the end of the time interval, and approximating the time derivative of head over the interval t_{m-1} to t_m; that is:

$$\begin{aligned} & CR_{i,j-1/2,k}(h^m_{i,j-1,k} - h^m_{i,j,k}) + CR_{i,j+1/2,k}(h^m_{i,j+1,k} - h^m_{i,j,k}) \\ & + CC_{i-1/2,j,k}(h^m_{i-1,j,k} - h^m_{i,j,k}) + CC_{i+1/2,j,k}(h^m_{i+1,j,k} - h^m_{i,j,k}) \\ & + CV_{i,j,k-1/2}(h^m_{i,j,k-1} - h^m_{i,j,k}) + CV_{i,j,k+1/2}(h^m_{i,j,k+1} - h^m_{i,j,k}) \\ & + P_{i,j,k}h^m_{i,j,k} + Q_{i,j,k} = SS_{i,j,k}(\Delta r_j \Delta c_i \Delta v_k)\frac{(h^m_{i,j,k} - h^{m-1}_{i,j,k})}{t_m - t_{m-1}}. \end{aligned} \qquad (24)$$

Equation (24) is a backward-difference equation which can be used as the basis for a simulation of the partial differential equation of ground water flow, equation (1). Like the term $Q_{i,j,k}$, the coefficients of the various head terms in equation (24) are all known, as is the head at the beginning of the time step, $h^{m-1}_{i,j,k}$. The seven heads at time t_m, the end of the time step, are unknown; that is, they are part of the head distribution to be predicted. Thus equation (24) cannot be solved independently, since it represents a single equation in seven unknowns. However, an equation of this type can be written for each active cell in the mesh; and, since there is only one unknown head for each cell, we are left with a system of "n" equations in "n" unknowns. Such a system can be solved simultaneously.

The objective of transient simulation is generally to predict head distributions at successive times, given the initial head distribution, the boundary conditions, the hydraulic parameters and the external stresses. The initial-head distribution provides a value of $h^1_{i,j,k}$ at each point in the mesh---that is, it provides the values of head at the beginning of the first of the discrete time steps into which the time axis is divided in the finite-difference process. The first step in the solution process is to calculate values of $h^2_{i,j,k}$--that is, heads at time t_2, which marks the end of the first time step. In equation (25), therefore, the head superscript m is taken as 2, while the superscript m-1, which appears in only one head term, is taken as 1. The equation therefore becomes

$$
\begin{aligned}
&CR_{i,j-1/2,k}(h^2_{i,j-1,k} - h^2_{i,j,k}) + CR_{i,j+1/2,k}(h^2_{i,j+1,k} - h^2_{i,j,k}) \\
&+ CC_{i-1/2,j,k}(h^2_{i-1,j,k} - h^2_{i,j,k}) + CC_{i+1/2,j,k}(h^2_{i+1,j,k} - h^2_{i,j,k}) \\
&+ CV_{i,j,k-1/2}(h^2_{i,j,k-1} - h^2_{i,j,k}) + CV_{i,j,k+1/2}(h^2_{i,j,k+1} - h^2_{i,j,k}) \\
&+ P_{i,j,k}h^2_{i,j,k} + Q_{i,j,k} \\
&\qquad = SS_{i,j,k} \frac{(\Delta r_j \Delta c_i \Delta v_k)(h^2_{i,j,k} - h^1_{i,j,k})}{t_2 - t_1} \qquad (25)
\end{aligned}
$$

where again the superscripts 1 and 2 refer to the time at which the heads are taken and should not be interpreted as exponents.

An equation of this form is written for every cell in the mesh in which head is free to vary with time (variable-head cells), and the system of equations is solved simultaneously for the heads at time t_2. When these have been obtained, the process is repeated to obtain heads at time t_3, the end of the second time step. To do this, equation (25) is reapplied, now using 2 as time subscript m-1 and 3 as time subscript m. Again, a system of equations is formulated, where the unknowns are now the heads at time t_3; and this set of equations is solved simultaneously to obtain the head distribution at time t_3. This process is continued for as many time steps as necessary to cover the time range of interest.

It is important to note that the set of finite-difference equations is reformulated at each time step; that is, at each step there is a new system of simultaneous equations to be solved. The heads at the end of the time step make up the unknowns for which this system must be solved; the heads at the beginning of the step are among the known terms in the equations. The solution process is repeated at each time step yielding a new array of heads for the end of the step.

Iteration

The model described in this report utilizes iterative methods to obtain the solution to the system of finite-difference equations for each time step. In these methods, the calculation of head values for the end of a given time step is started by arbitrarily assigning a trial value, or estimate, for the head at each node at the end of that step. A procedure of calculation is then initiated which alters these estimated values, producing a new set of head values which are in closer agreement with the system of equations. These new, or interim, head values then take the place of the initially assumed heads, and the procedure of calculation is repeated, producing a third set of head values. This procedure is repeated successively, at each stage producing a new set of interim heads which more nearly satisfies the system of equations. Each repetition of the calculation is termed an "iteration." Ultimately, as the interim heads approach values which would exactly satisfy the set of equations, the changes produced by succeeding stages of calculation become very small. This behaviour is utilized in determining when to stop iteration, as discussed in a subsequent paragraph.

Thus, during the calculations for a time step, arrays of interim head values are generated in succession, each array containing one interim head value for each active node in the mesh. In figure 7, these arrays are represented as three-dimensional lattices, each identified by an array symbol, $\bar{h}$, bearing two superscripts. The first superscript indicates the time step for which the heads in the array are calculated, while the second indicates the number, or level, of the iteration which produced the head array. Thus $\bar{h}^{m,2}$ represents the array of values computed in the first iteration for the end of step m; $\bar{h}^{m,2}$ would represent the array of values computed in the second iteration; and so on. The head values which were initially assumed for the end of time step m, to begin the process of iteration, appear in the array designated $\bar{h}^{m,o}$. In the example of figure 7, a total of n iterations is required to achieve closure for the heads at the end of time step m; thus the array of final head values for the time step is designated $\bar{h}^{m,n}$. Figure 7 also shows the array of final head values for the end of the preceding time step $\bar{h}^{m-1,n}$ (where again it is assumed that n iterations were required for closure). The head values in this array appear in the storage term of equation (24)--i.e., they are used in the term $h_{i,j,k}^{m-1}$ on the right side of equation (24)--in the calculation of heads for time step m. Because they represent heads for the preceding time step, for which computations have

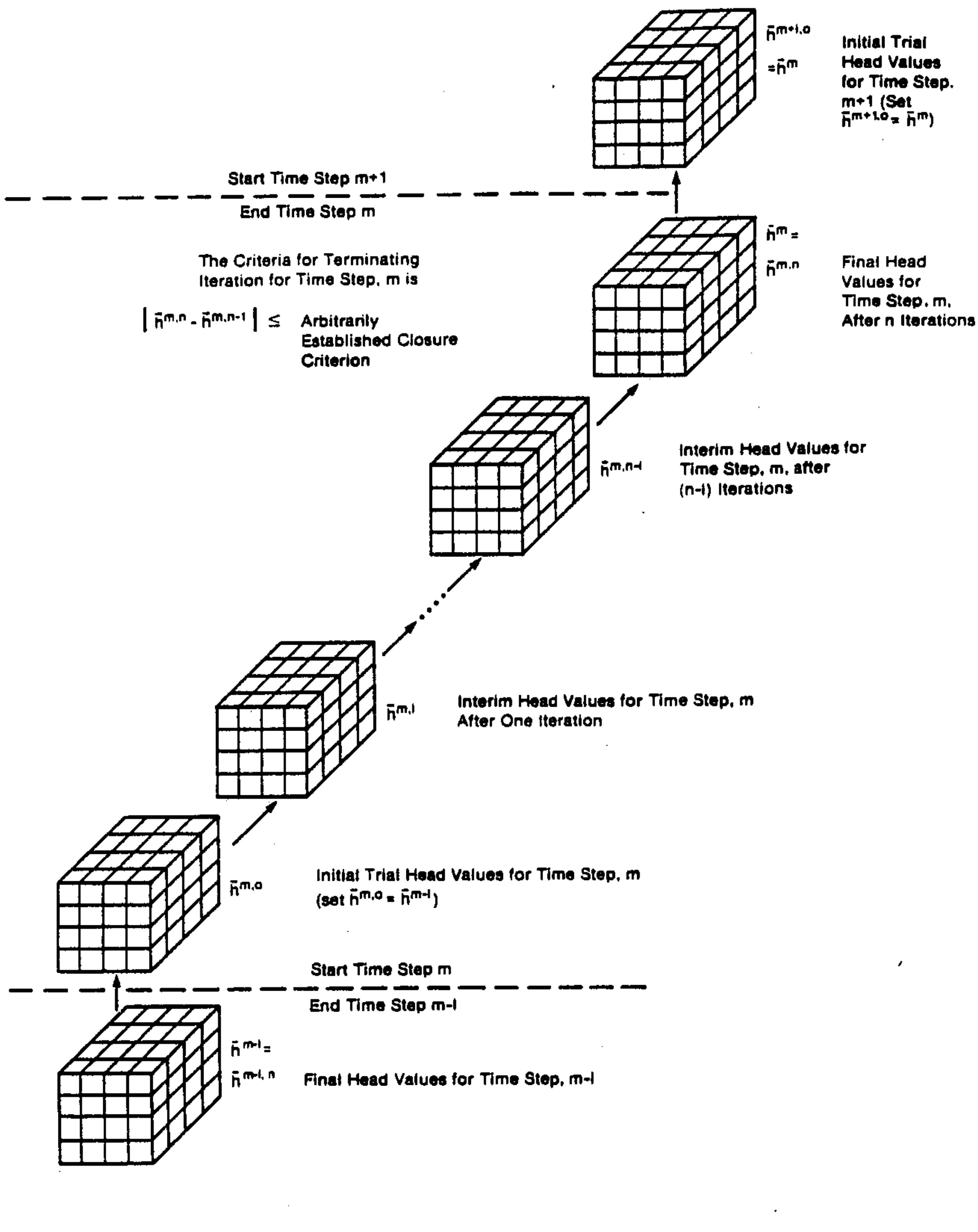


Figure 7.—Iterative calculation of a head distribution.

already been completed, they appear as predetermined constants in the equation for time step m; thus they retain the same value in each iteration of the time step. Similarly, the final values of head for time step m are used as constants in the storage term during calculations for time step m+1.

Ideally, one would like to specify that iteration stop when the calculated heads are suitably close to the exact solution. However, because the actual solution is unknown, an indirect method of specifying when to stop iterating must be used. The method most commonly employed is to specify that the changes in computed heads occuring from one iteration level to the next must be less than a certain quantity, termed the "closure criterion" or "convergence criterion," which is specified by the user. After each iteration, absolute values of computed head change in that iteration are examined for all nodes in the mesh. The largest of these absolute head change values is compared with the closure criterion. If this largest value exceeds the closure criterion, iteration continues; if it is less than the closure criterion, iteration is said to have "closed" or "converged," and the process is terminated for that time step. Normally, this method of determining when to stop iteration is adequate. Note that the closure criterion refers to change in computed head, and that values of head are not themselves necessarily calculated to a level of accuracy comparable to the closure criterion. As a rule of thumb, it is wise to use a value of closure criterion that is an order of magnitude smaller than the level of accuracy desired in the head results.

The program described herein also incorporates a maximum permissible number of iterations per time step. If closure is not achieved within this maximum number of iterations, the iterative process will be terminated and a corresponding message printed in the output. The closure criterion is designated HCLOSE in the model input, while the maximum number of iterations per time step is designated MXITER.

The initial estimates of head for the end of time step m, in array $\bar{h}^{m,o}$ of figure 7, could be assigned arbitrarily, or they could be chosen according to a number of different conventions. Theoretically, the iterative process would eventually converge to the same result regardless of the choice of initial head values, although the work required would be much greater for some choices than for others. In the model described in this report, the heads computed for the end of each time step are used as the initial trial values of head for the end of the succeeding time step. Thus in figure 7, the array $\bar{h}^{m-1,n}$ contains the final estimates of head, obtained after n iterations, for the end of time step m-1. When the calculations for step m-1 are complete, these same values of head are transferred to the array $\bar{h}^{m,o}$, and used as the initial estimates, or trial values, for the heads at the end of time step m. Head values for the end of the first time step in the simulation are assumed initially to be equal to the heads specified by the user for the beginning of the simulation.

Discussions of the mathematical basis of various iterative methods may be found in many standard references, including Peaceman (1977), Crichlow (1977) and Remson, Hornberger and Molz (1971). It is suggested that the reader review one of these discussions, both to clarify general concepts and to provide an introduction to such topics as the use of matrix notation, the role of iteration parameters, and the influence of various factors on rate of convergence. In particular, such a review is recommended prior to reading Chapters 12 and 13 of this report.

An iterative procedure yields only an approximation to the solution of the system of finite-difference equations for each time step; the accuracy of this approximation depends upon several factors, including the closure criterion which is employed. However, it is important to note that even if exact solutions to the set of finite-difference equations were obtained at each step, these exact solutions would themselves be only an approximation to the solution of the differential equation of flow (equation (1)). The discrepancy between the head, $h^m_{i,j,k}$, given by the solution to the system of difference equations for a given node and time, and the head $h(x_i, y_j, z_k, t_m)$ which would be given by the formal solution of the differential equation for the corresponding point and time, is termed the truncation error. In general, this error tends to become greater as the mesh spacing and time-step length are increased. Finally, it must be recognized that even if a formal solution of the differential equation could be obtained, it would normally be only an approximation to conditions in the field, in that hydraulic conductivity and specific storage are seldom known with accuracy, and uncertainties with regard to hydrologic boundaries are generally present.

Formulation of Equations for Solution

The model described in this report presently incorporates two different options for iterative solution of the set of finite-difference equations, and is organized so that alternative schemes of solution may be added without disruption of the program structure. Whatever scheme of solution is employed, it is convenient to rearrange equation (24) so that all terms containing heads at the end of the current time step are grouped on the left-hand side of the equation, and all terms that are independent of head at the end of the current time step are on the right-hand side. The resulting equation is

$$CV_{i,j,k-1/2}h^{m}_{i,j,k-1} + CC_{i-1/2,j,k}h^{m}_{i-1,j,k} + CR_{i,j-1/2,k}h^{m}_{i,j-1,k}$$

$$+ (-CV_{i,j,k-1/2} - CC_{i-1/2,j,k} - CR_{i,j-1/2,k} - CR_{i,j+1/2,k}$$

$$- CC_{i+1/2,j,k} - CV_{i,j,k+1/2} + HCOF_{i,j,k})h^{m}_{i,j,k} + CR_{i,j+1/2,k}h^{m}_{i,j+1,k}$$

$$+ CC_{i+1/2,j,k}h^{m}_{i+1,j,k} + CV_{i,j,k+1/2}h^{m}_{i,j,k+1} = RHS_{i,j,k} \qquad (26)$$

where

$$HCOF_{i,j,k} = P_{i,j,k} - SC1_{i,j,k}/(t_m - t_{m-1}); \qquad (L^2t^{-1})$$

$$RHS_{i,j,k} = - Q_{i,j,k} - SC1_{i,j,k}h^{m-1}_{i,j,k}/(t_m - t_{m-1}); \text{ and } \qquad (L^3t^{-1})$$

$$SC1_{i,j,k} = SS_{i,j,k}\Delta r_j \Delta c_i \Delta v_k. \qquad (L^2)$$

The entire system of equations of the form of (26), which includes one equation for each variable-head cell in the mesh, may be written in matrix form as

$$[A] \{h\} = \{q\} \qquad (27)$$

where [A] is a matrix of the coefficients of head, from the left side of equation (26), for all active nodes in the mesh; {h} is a vector of head values at the end of time step m for all nodes in the mesh; and {q} is a vector of the constant terms, RHS, for all nodes of the mesh. The model described in this report assembles the vector {q} and the terms that comprise [A] through a series of subroutines, or "modules". The vector {q} and the terms comprising [A] are then transferred to modules which actually solve the matrix equations for the vector {h} .

Types of Model Cell and Simulation of Boundaries

In practice, it is generally unnecessary to formulate an equation of the form of (24) for every cell in a model mesh, as the status of certain cells is specified in advance in order to simulate the boundary conditions of the problem. In the model described in this report, cells of this type are grouped into two categories--"constant-head" cells and "inactive" (or "no-flow") cells. Constant-head cells are those for which the head is specified in advance, and is held at this specified value through all time steps of the simulation. Inactive or no-flow cells are those for which no flow into or out of the cell is permitted, in any time step of the simulation. The remaining cells of the mesh, termed "variable-head" cells in this report, are characterized by heads which are unspecified and free to vary with time. An equation of the form of (24) must be formulated for each variable-head cell in the mesh, and the resulting system of equations must be solved simultaneously for each time step in the simulation.

Constant-head and no flow cells are used in the model described herein to represent conditions along various hydrologic boundaries. For example, figure 8 shows the map of an aquifer boundary superimposed on an array of cells generated for the model. The aquifer is of irregular shape, whereas the model array is always rectangular in outline; no-flow cells have therefore been used to delete the portion of the array beyond the aquifer boundary. The figure also shows constant-head cells along one section of the boundary; these may be used, for example, where the aquifer is in direct contact with major surface water features. Other boundary conditions, such as areas of constant inflow or areas where inflow varies with head, can be simulated through the use of external source terms or through a combination of no-flow cells and external source terms.

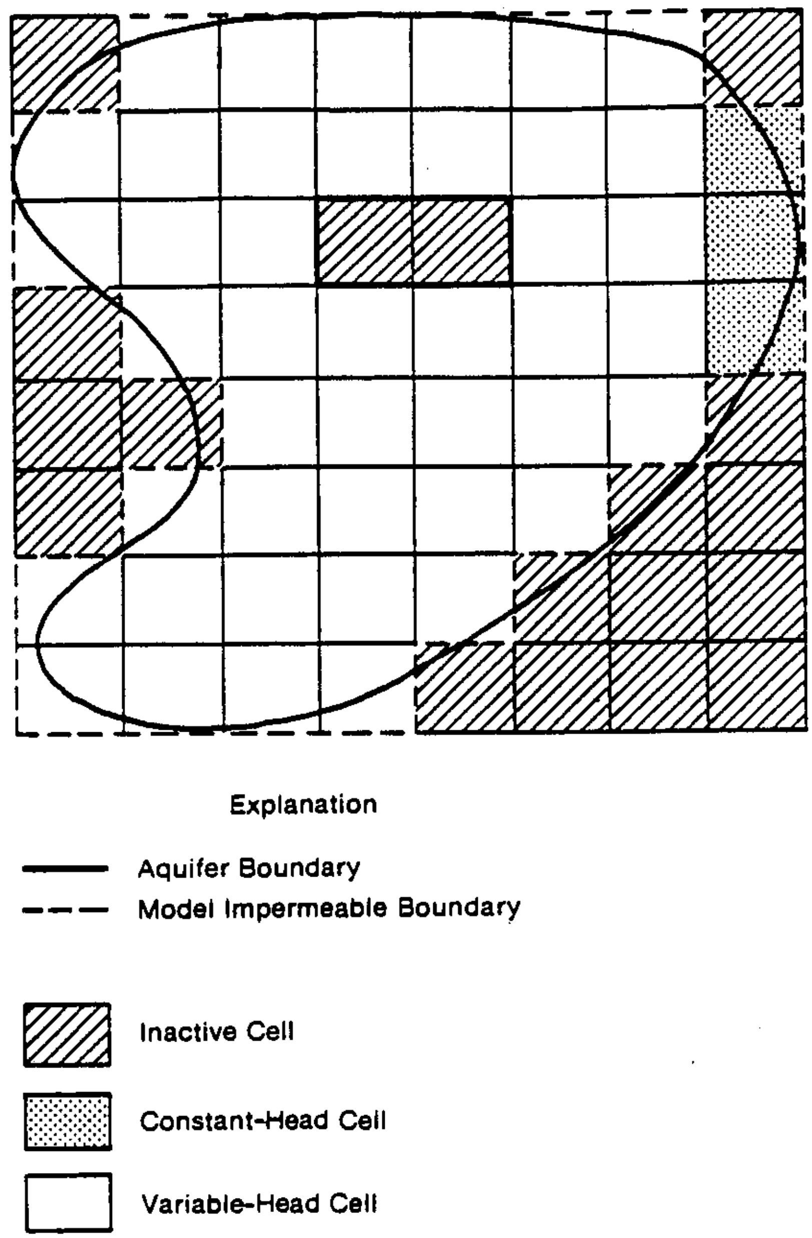


Figure 8.—Discretized aquifer showing boundaries and cell designations.

Conceptual Aspects of Vertical Discretization

The model described in this document handles discretization of space in the horizontal direction by reading the number of rows, the number of columns and the width of each row and column (that is, the width of the cells in the direction transverse to the row or column). Discretization of space in the vertical direction is handled in the model by specifying the number of layers to be used, and by specifying hydraulic parameters which contain or embody the layer thickness. This approach is followed in preference to explicit reading of layer thickness in order to accomodate two different ways of viewing vertical discretization.

At one extreme, vertical discretization can be visualized simply as an extension of areal discretization--a more or less arbitrary process of dividing the flow system into segments along the vertical, governed in part by the vertical resolution desired in the results. At the opposite extreme, vertical discretization can be viewed as an effort to represent individual aquifers or permeable zones by individual layers of the model. Figure 9-a shows a typical geohydrologic sequence which has been discretized according to both interpretations--in 9-b according to the first viewpoint, and in 9-c according to the second. The first viewpoint leads to rigid superposition of an orthogonal three-dimensional mesh on the geohydrologic system; while there may be a general correspondence between geohydrologic layers and model layers, no attempt is made to make the mesh conform to stratigraphic irregulaties. Under the second viewpoint, model layer thickness is considered variable, to simulate the varying thickness of geohydrologic units; this leads, in effect, to a deformed mesh.

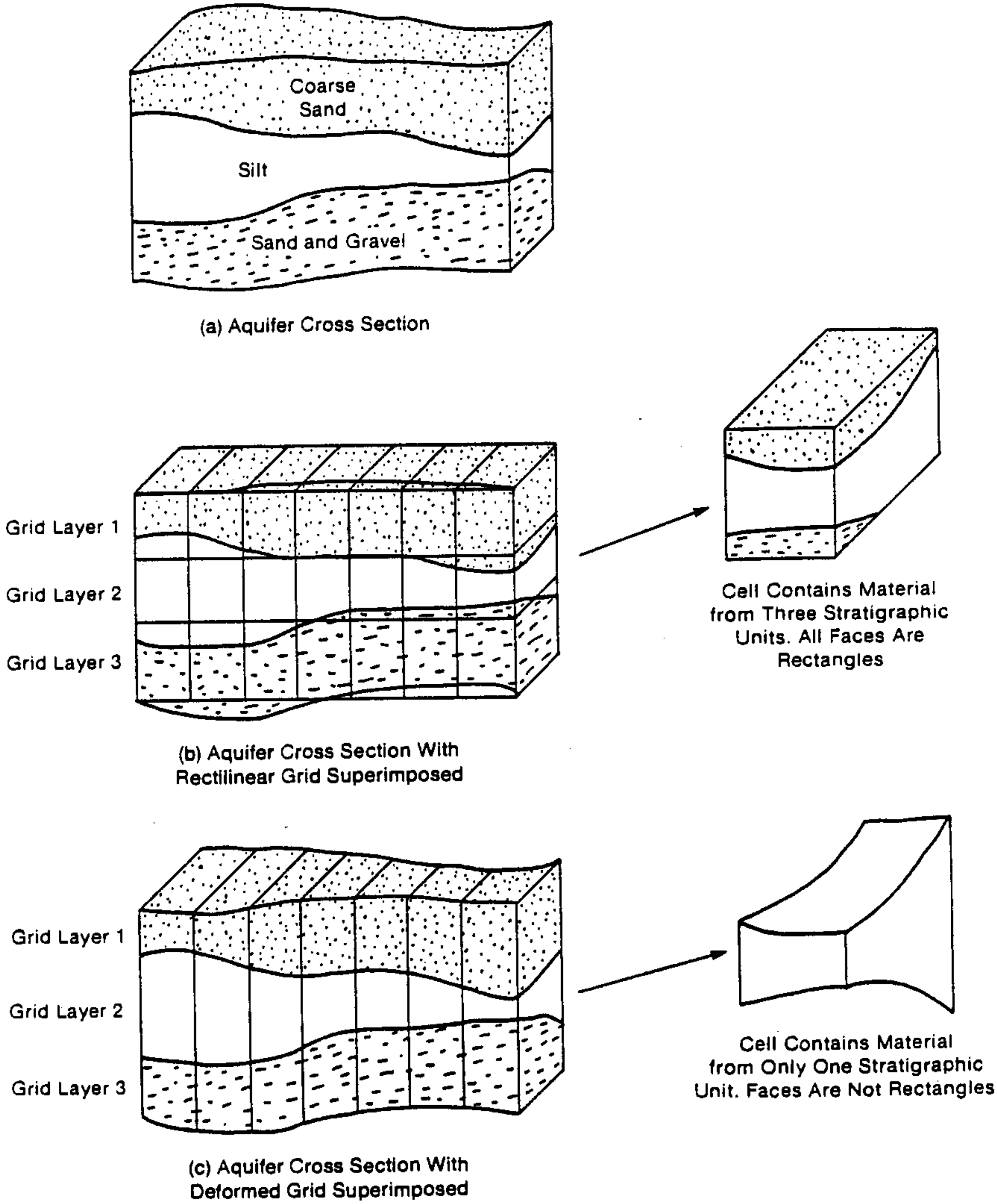


Figure 9.—Schemes of vertical discretization.

Each of these methods of viewing the vertical discretization process has advantages, and each presents difficulties. The model equations are based on the assumption that hydraulic properties are uniform within individual cells, or at least that meaningful average or integrated parameters can be specified for each cell; these conditions are more likely to be met when model layers conform to geohydrologic units as in figure 9-c. Moreover, greater accuracy can be expected if model layers correspond to intervals within which vertical head loss is negligible, and this is also more likely under the configuration of 9-c. On the other hand, the deformed mesh of 9-c fails to conform to many of the assumptions upon which the model equations are based; for example, individual cells may no longer have rectangular faces, and the major axes of hydraulic conductivity may not be aligned with the model axis. Some error is always introduced by these departures from assumed conditions.

In practice many vertical discretization schemes turn out to be a combination of the viewpoints illustrated in figures 9-b and 9-c. For example, even where layer boundaries conform to geohydrologic contacts, it may be necessary to use more than one layer to simulate a single geohydrologic unit, simply to achieve the resolution required in the results. Figure 10 shows a system consisting of two sand units separated by a clay; the units are of uniform thickness, and each could be represented by a single layer without deformation of the mesh. However, flow is neither fully horizontal nor fully vertical in any of the layers; if information on the direction of flow within each unit is required, several layers must be used to represent each unit. Similarly, figure 11 shows a sand-clay system in which pumpage from the sands is sustained partially by vertical flow of water released from storage in the clay. If the objective of analysis is to determine the pattern of storage release in the clay, several model layers would be

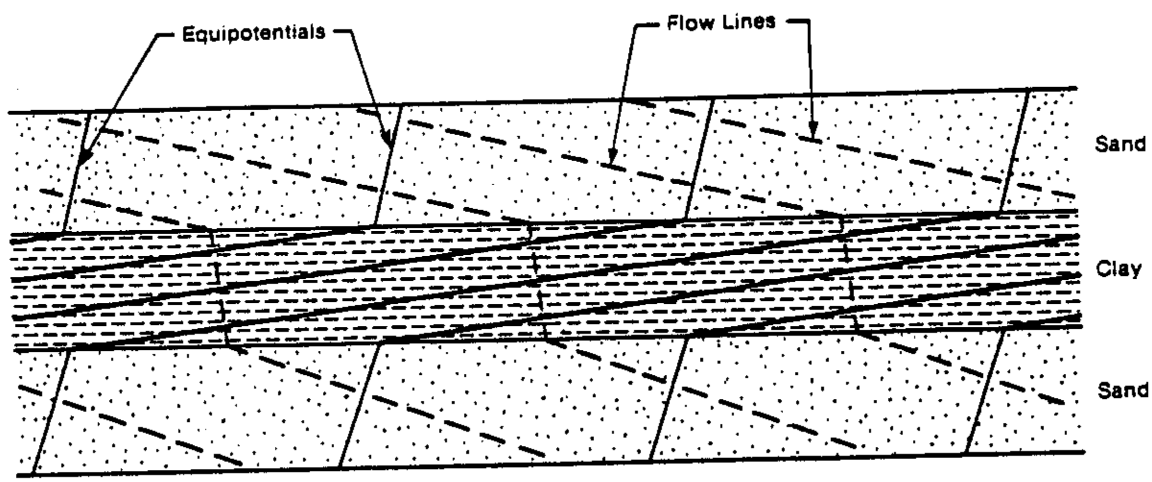


Figure 10.—Possible pattern of flow in a cross section consisting of two high conductivity units separated by a low conductivity unit.

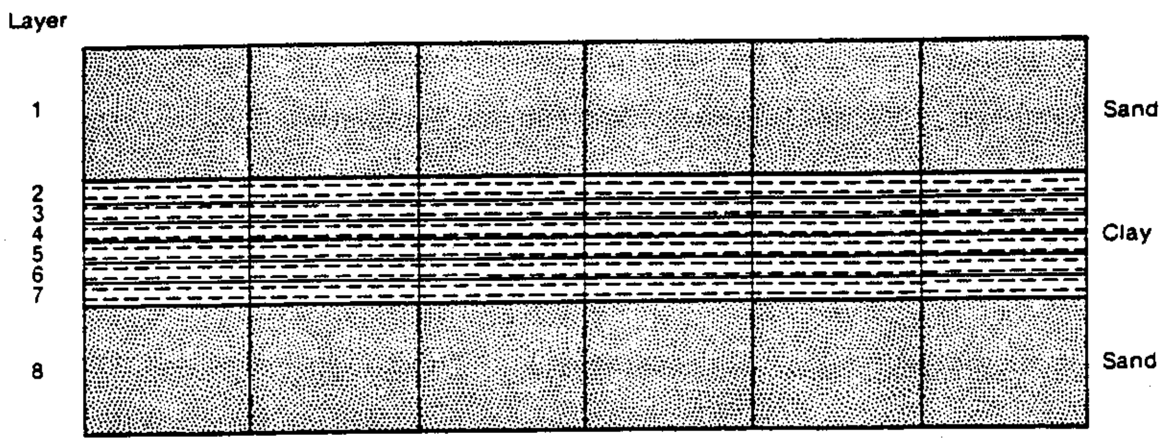


Figure 11.—A cross section in which a low conductivity unit is represented by six model layers.

required to represent that unit, as shown in the figure. On the other hand, figure 12 shows a sand-clay system in which storage release occurs only in the sands, flow in the sand is essentially horizontal, and flow in the clay is essentially vertical. In this case a single model layer may be used to represent each sand, while the clay may be represented simply by the vertical conductance between layers. This approach to vertical discretization has sometimes been termed the "quasi three-dimensional" approach.

The approaches to vertical discretization described above all lead to a set of equations of the form of (26), which must be solved simutaneously at each time step. The differences among these approaches arise in the way the various conductances and storage terms are formulated and, in general, in the number of equations to be solved, the resolution of the results, and the accuracy of the results. The model described in this document is capable of implementing any of these approaches to vertical discretization in that, as noted above, the thickness of individual layers (Δv_k of figure 1 and equation (24)) is never read explicitly by the program; rather, this thickness is embedded in various hydraulic coefficients specified by the user. For example, in confined layers transmissivity, which is the product of hydraulic conductivity and layer thickness, is specified; and storage coefficient, the product of specific storage and layer thickness, is also used. For an unconfined layer, aquifer bottom elevation and hydraulic conductivity are input for each cell. Saturated thickness is calculated as head minus bottom elevation, and transmissivity is then calculated as hydraulic conductivity times saturated thickness. Thus, layer thickness can vary from cell to cell depending on bottom elevation and head. Chapter 5, which describes the Block Centered Flow Package, contains a discussion of the formulation of conductance and storage terms corresponding to the various ways of conceptualizing the vertical discretization.

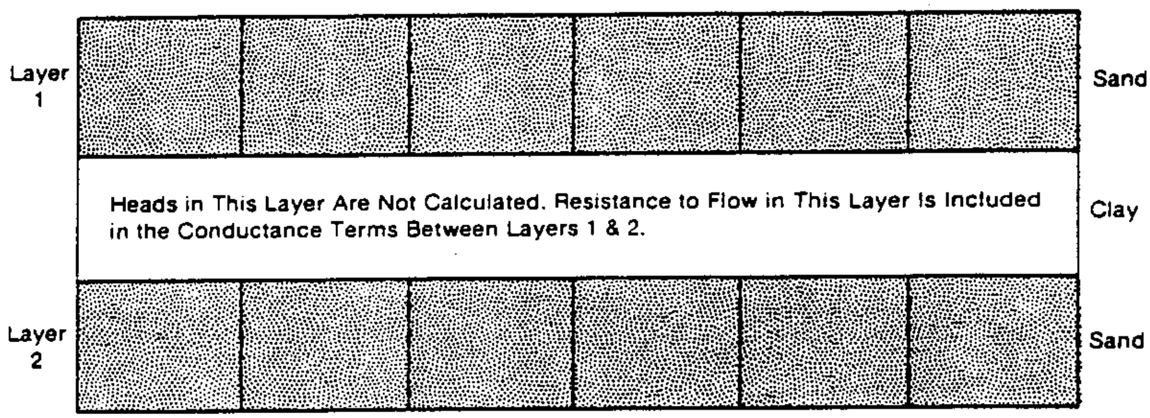


Figure 12.—A cross section in which a low conductivity unit is represented by the conductance between model layers.

APPENDIX C

Modflow Drawdown Calculations

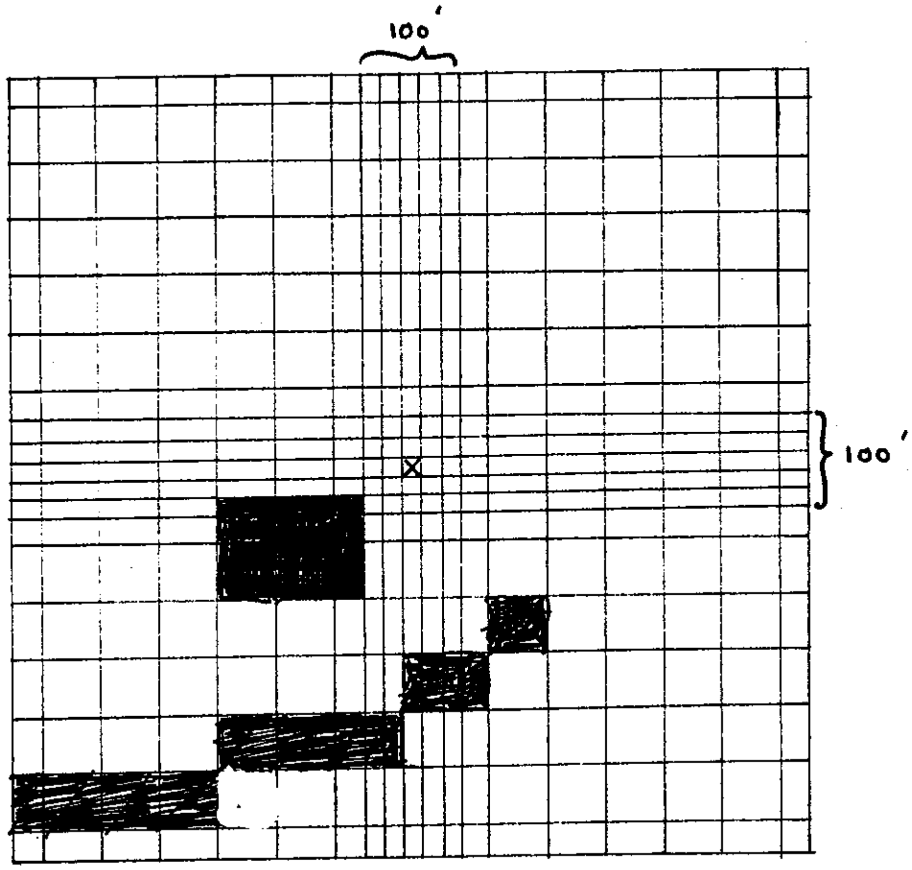
MODFLOW Simulation and Actual Head Comparisons including Simulated Discharge Drawdowns
2SR (proposed CAP well RW-2) pond=910 feet
K=6.6x10e-4 Q=0.9 gpm
b= 36 to 45 feet

CELL NUMBER (i,j)	ACTUAL HEAD	SIMULATED STEADY-STATE HEAD	HEAD DIFFERENCE	SIMULATED PUMPING HEAD	SIMULATED DRAWDOWN	RADIAL DISTANCE	CONSTANT HEAD CELL	ESTIMATED RECOVERY HEAD
1,1	902.6	907.4	4.8	906.9	-0.5	560	NO	902.1
1,35	922.6	906.5	-16.1	905.8	-0.7	560	NO	921.9
5,5	902.8	907.7	4.9	907.3	-0.4	240	NO	902.4
5,31	917.5	906.6	-10.9	905.9	-0.7	240	NO	916.8
8,8	911.5	908.2	-3.3	907.3	-0.9	65	NO	910.6
8,28	913	907.1	-5.9	906	-1.1	65	NO	911.9
10,10	912	908.1	-3.9	906.9	-1.2	38	NO	910.8
10,26	912.5	907.3	-5.2	905.9	-1.4	38	NO	911.1
14,14	912.4	907.8	-4.6	905.8	-2	12	NO	910.4
14,22	911.8	907.5	-4.3	905.4	-2.1	12	NO	909.7
18,18	912	907.6	-4.4	903.1	-4.5	0	NO	907.5
22,14	911.4	907.8	-3.6	905.9	-1.9	12	NO	909.5
22,22	912	907.4	-4.6	905.4	-2	12	NO	910
26,10	910.8	908.3	-2.5	907.4	-0.9	38	NO	909.9
26,26	911.5	907	-4.5	905.7	-1.3	38	NO	910.2
28,8	910	908.8	-1.2	908.4	-0.4	65	NO	909.6
28,28	911.5	906.5	-5	905.6	-0.9	65	NO	910.6
31,5	904	905	1	904.9	-0.1	240	NO	903.9
31,31	910	904.3	-5.7	904.1	-0.2	240	NO	909.8
35,1	901.5	900.4	-1.1	900.4	0	560	NO	901.5
35,35	919	904	-15	903.7	-0.3	560	NO	918.7

NOTES:
1. Cell Number - row then column for (i,j) notation.
2. Actual Head - interpolated from 8/21/91 water table map at block centered (i,j) location.
3. Simulated Steady-State Head - MODFLOW Simulated Head without discharge stress from pumping well.
4. Head Difference - MODFLOW Simulated Steady-State Head minus Actual Head.
5. Simulated Pumping Head - MODFLOW Simulated Head with discharge stress from pumping well located at (i,j)=(19,19).
6. Simulated Drawdown - MODFLOW Simulated Pumping Head minus MODFLOW Simulated Steady-State Head.
7. Radial Distance - (i,j) block centered distance from discharge (i,j) cell.
8. Constant Head Cell - cell that corresponds to known hydrogeologic constant head boundaries such as a stream or creek.
9. Estimated Recovery Head - Actual Head minus Simulated Drawdown.

NOTE: FINE DISCRETISATION OF GRID IN THE CENTRAL 100 FEET ZONE NOT DRAWN FOR CLARITY. THIS ZONE WAS DISCRETISED FROM 10 FEET TO 2 FEET.

2SR/2DR



☒ - PUMPING WELL

■ - CONSTANT HEAD BOUNDARIES

□ - VARIABLE HEAD


BELL ROAD
933.11
ALOH SAND DRYING BEDS
AND APPLICATION
C-2
FABRICATION BUILDING
MAIN BUILDING
FORMER FO19 SANDBEDS
SETTLING POND
POLISHING POND
903.85
908.35
910.87
33D
41D
919.8
26D 915.04
26S 915.28
910
915
920
905
28S
28D
29D
29S
902.13
10D
901.68
12D
12S
900.87
35D
903.15
C-1
39D
7D
7S
15D
15S
16S
16D
27D
908.02
902.16
1S
1D

25K - FINAL
WELL

Q = 0.9 gpm.
$K = 6.6 \times 10^{-4}$ ft/min
b = 36-45 feet.

```
1                        U.S. GEOLOGICAL SURVEY MODULAR FINITE-DIFFERENCE GROUND-WATER MODEL
0BONMOD1 1 layer, 35 rows, 35 columns, 0 well                                            unconfined, impermeable bedrock TEST RUN
    1 LAYERS          35 ROWS          35 COLUMNS
   1 STRESS PERIOD(S) IN SIMULATION
 MODEL TIME UNIT IS SECONDS
0I/O UNITS:
 ELEMENT OF IUNIT:  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
         I/O UNIT: 11 12  0  0  0  0  0  0 19  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0BAS1 -- BASIC MODEL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT  1
 ARRAYS RHS AND BUFF WILL SHARE MEMORY.
 START HEAD WILL BE SAVED
     11099 ELEMENTS IN X ARRAY ARE USED BY BAS
     11099 ELEMENTS OF X ARRAY USED OUT OF    30000
0BCF1 -- BLOCK-CENTERED FLOW PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 11
 STEADY-STATE SIMULATION
       LAYER  AQUIFER TYPE
       -------------------
         1         1
      2451 ELEMENTS IN X ARRAY ARE USED BY BCF
     13550 ELEMENTS OF X ARRAY USED OUT OF    30000
0WEL1 -- WELL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM 12
 MAXIMUM OF     1 WELLS
         4 ELEMENTS IN X ARRAY ARE USED FOR WELLS
     13554 ELEMENTS OF X ARRAY USED OUT OF    30000
0SIP1 -- STRONGLY IMPLICIT PROCEDURE SOLUTION PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 19
 MAXIMUM OF 100 ITERATIONS ALLOWED FOR CLOSURE
  5 ITERATION PARAMETERS
      5305 ELEMENTS IN X ARRAY ARE USED BY SIP
     18859 ELEMENTS OF X ARRAY USED OUT OF    30000
1BONMOD1 1 layer, 35 rows, 35 columns, 0 well                                            unconfined, impermeable bedrock TEST RUN
0
```

BOUNDARY ARRAY FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35I2)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
0 1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 25	1	1	1	1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 26	1	1	1	1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 27	1	1	1	1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 28	1	1	1	1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1	1	1
0 32	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	1	1	1	1	1	1
0 33	1	1	1	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 34	-1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 35	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					

1 1 1 1 1
0AQUIFER HEAD WILL BE SET TO 999.90 AT ALL NO-FLOW NODES (IBOUND=0).
0

INITIAL HEAD FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35F5.0)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
0 1	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 2	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 3	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 4	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 5	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 6	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 7	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 8	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 9	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 10	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 11	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 12	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 13	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 14	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 15	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 16	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 17	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 18	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 19	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 20	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 21	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 22	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 23	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 24	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 25	880.0	880.0	880.0	880.0	910.0	910.0	910.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 26	880.0	880.0	880.0	880.0	910.0	910.0	910.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 27	880.0	880.0	880.0	880.0	910.0	910.0	910.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 28	880.0	880.0	880.0	880.0	910.0	910.0	910.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 29	880.0	888.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 30	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 31	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	904.0	880.0	880.0	880.0	880.0	880.0
0 32	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	902.0	902.0	902.0	902.0	902.0	902.0	902.0	902.0	902.0	902.0	902.0	902.0	902.0	902.0	902.0	902.0	880.0	880.0	880.0	880.0	880.0	880.0

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0 33     880.0   880.0   880.0   880.0   901.0   901.0   901.0   902.0   902.0   902.0   902.0   902.0   902.0   880.0   880.0
         880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
         880.0   880.0   880.0   880.0   880.0
0 34     900.0   901.0   901.0   901.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
         880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
         880.0   880.0   880.0   880.0   880.0
0 35     880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
         880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
         880.0   880.0   880.0   880.0   880.0
0DEFAULT OUTPUT CONTROL -- THE FOLLOWING OUTPUT COMES AT THE END OF EACH STRESS PERIOD:
 TOTAL VOLUMETRIC BUDGET
          HEAD
          DRAWDOWN
0                                               COLUMN TO ROW ANISOTROPY =   1.000000
0

                                         DELR WILL BE READ ON UNIT 11 USING FORMAT:            (35F6.3)
                              ----------------------------------------------------------------------------

   60.000        60.000        60.000        60.000        60.000        60.000        30.000        10.000        10.000        5.0000
   5.0000        5.0000        5.0000        3.0000        2.0000        2.0000        2.0000        2.0000        2.0000        2.0000
   2.0000        3.0000        5.0000        5.0000        5.0000        5.0000        10.000        10.000        30.000        60.000
   60.000        60.000        60.000        60.000        60.000
0

                                         DELC WILL BE READ ON UNIT 11 USING FORMAT:            (35F6.3)
                              ----------------------------------------------------------------------------

   60.000        60.000        60.000        60.000        60.000        60.000        30.000        10.000        10.000        5.0000
   5.0000        5.0000        5.0000        3.0000        2.0000        2.0000        2.0000        2.0000        2.0000        2.0000
   2.0000        3.0000        5.0000        5.0000        5.0000        5.0000        10.000        10.000        30.000        60.000
   60.000        60.000        60.000        60.000        60.000
0                                                  HYD. COND. ALONG ROWS =   0.1100000E-04 FOR LAYER  1
0                                                                 BOTTOM =   865.0000      FOR LAYER  1
0


                                                      SOLUTION BY THE STRONGLY IMPLICIT PROCEDURE
                                                      -------------------------------------------
0                                         MAXIMUM ITERATIONS ALLOWED FOR CLOSURE =       100
                                                         ACCELERATION PARAMETER =      1.0000
                                             HEAD CHANGE CRITERION FOR CLOSURE =    0.10000E-02
                                             SIP HEAD CHANGE PRINTOUT INTERVAL =        1
0
    5 ITERATION PARAMETERS CALCULATED FROM SPECIFIED WSEED = 0.00100000 :

          0.0000000E+00  0.8221720E+00  0.9683772E+00  0.9943766E+00  0.9990000E+00
1                                            STRESS PERIOD NO.   1, LENGTH =    1728000.
                                             ----------------------------------------------

                                             NUMBER OF TIME STEPS =    20

                                               MULTIPLIER FOR DELT =     1.000

                                            INITIAL TIME STEP SIZE =   86400.00
0           1 WELLS
                                          LAYER    ROW    COL    STRESS RATE   WELL NO.
                                          ----------------------------------------------
                                            1       18     18    -0.20000E-02       1
0
    42 ITERATIONS FOR TIME STEP   1 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
    27.82      (  1, 24,  5)   11.76      (  1, 31,  4)   12.95      (  1, 22,  9)   14.69      (  1,  2,  1)   15.97      (  1,  7, 14)
    5.095      (  1,  9,  7)   4.364      (  1, 11,  8)   3.915      (  1, 23, 11)   11.15      (  1, 18, 10)   5.530      (  1, 12, 19)
    1.017      (  1,  6,  8) -0.7402      (  1, 19, 11)  -1.867      (  1, 21, 11)  -1.031      (  1, 26, 11)  -2.601      (  1, 11, 13)
   0.5664      (  1,  7,  8)  0.4897      (  1,  8, 10)  0.3305      (  1, 10, 15)  0.9696      (  1, 12, 15)  0.7815      (  1, 22, 14)
  -0.1610      (  1, 29,  8) -0.7496E-01 (  1, 28, 10) -0.1086      (  1, 15, 20) -0.1906      (  1, 18, 18) -0.3023      (  1, 13, 10)
   0.5571E-01 (  1,  8,  7)  0.4445E-01 (  1, 10,  8)  0.3165E-01 (  1, 18, 11)  0.1150      (  1, 16, 11)  0.9082E-01 (  1, 14, 22)
  -0.1319E-01 (  1, 29,  8) -0.7303E-02 (  1, 28, 10) -0.1293E-01 (  1, 21, 13) -0.1767E-01 (  1, 22, 14) -0.2963E-01 (  1, 10, 12)
   0.5951E-02 (  1,  7,  7)  0.4331E-02 (  1,  8,  9)  0.3467E-02 (  1, 10,  9)  0.1025E-01 (  1, 13, 14)  0.9303E-02 (  1, 18, 18)
  -0.1746E-02 (  1, 29,  8) -0.8953E-03 (  1, 28, 10)
0
     1 ITERATIONS FOR TIME STEP   2 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
  -0.2699E-03 (  1, 29, 13)
0
     1 ITERATIONS FOR TIME STEP   3 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
  -0.1543E-03 (  1, 28, 12)
0
     1 ITERATIONS FOR TIME STEP   4 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
  -0.1137E-03 (  1, 27, 12)
0
     1 ITERATIONS FOR TIME STEP   5 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
  -0.1004E-03 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP   6 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.9539E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP   7 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
```

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0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.9056E-04 (  1, 18, 18)
0
      1 ITERATIONS FOR TIME STEP   8 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.8689E-04 (  1, 18, 18)
0
      1 ITERATIONS FOR TIME STEP   9 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
  -0.8218E-04 (  1, 18, 18)
0
      1 ITERATIONS FOR TIME STEP  10 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.7916E-04 (  1, 18, 18)
0
      1 ITERATIONS FOR TIME STEP  11 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.7443E-04 (  1, 18, 18)
0
      1 ITERATIONS FOR TIME STEP  12 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.7185E-04 (  1, 18, 18)
0
      1 ITERATIONS FOR TIME STEP  13 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.6820E-04 (  1, 18, 18)
0
      1 ITERATIONS FOR TIME STEP  14 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.6560E-04 (  1, 18, 18)
0
      1 ITERATIONS FOR TIME STEP  15 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.6267E-04 (  1, 18, 18)
0
      1 ITERATIONS FOR TIME STEP  16 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.6090E-04 (  1, 18, 18)
0
      1 ITERATIONS FOR TIME STEP  17 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.5788E-04 (  1, 18, 18)
0
      1 ITERATIONS FOR TIME STEP  18 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.5476E-04 (  1, 19, 18)
0
      1 ITERATIONS FOR TIME STEP  19 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
  -0.5375E-04 (  1, 18, 18)
0
      1 ITERATIONS FOR TIME STEP  20 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.5161E-04 (  1, 18, 18)
0
1                   HEAD IN LAYER  1 AT END OF TIME STEP 20 IN STRESS PERIOD  1
          ---------------------------------------------------------------------------

              1          2          3          4          5          6          7          8          9         10
             11         12         13         14         15         16         17         18         19         20
             21         22         23         24         25         26         27         28         29         30
             31         32         33         34         35
 ....................................................................................................................
0  1      906.9      906.9      906.9      906.9      906.8      906.7      906.7      906.6      906.6      906.6
          906.6      906.6      906.5      906.5      906.5      906.5      906.5      906.5      906.5      906.5
          906.5      906.5      906.5      906.5      906.5      906.5      906.4      906.4      906.4      906.3
          906.1      906.0      905.9      905.9      905.8
0  2      907.0      907.0      906.9      906.9      906.9      906.8      906.7      906.6      906.6      906.6
          906.6      906.6      906.6      906.5      906.5      906.5      906.5      906.5      906.5      906.5
          906.5      906.5      906.5      906.5      906.5      906.5      906.4      906.4      906.4      906.2
          906.1      906.0      905.9      905.8      905.8
0  3      907.0      907.0      907.0      907.0      906.9      906.8      906.7      906.7      906.6      906.6
          906.6      906.6      906.6      906.6      906.6      906.6      906.6      906.5      906.5      906.5
          906.5      906.5      906.5      906.5      906.5      906.5      906.4      906.4      906.3      906.2
          906.1      905.9      905.8      905.8      905.7
0  4      907.0      907.0      907.0      907.1      907.1      907.0      906.8      906.7      906.7      906.7
          906.7      906.6      906.6      906.6      906.6      906.6      906.6      906.6      906.6      906.6
          906.6      906.5      906.5      906.5      906.5      906.5      906.4      906.4      906.3      906.2
          906.0      905.8      905.7      905.7      905.6
0  5      906.9      907.0      907.1      907.2      907.3      907.2      907.0      906.9      906.8      906.8
          906.7      906.7      906.7      906.7      906.6      906.6      906.6      906.6      906.6      906.6
```

	906.6	906.6	906.5	906.5	906.5	906.5	906.4	906.4	906.3	906.1
	905.9	905.7	905.6	905.6	905.5					
0 6	906.8	906.9	907.1	907.4	907.6	907.5	907.2	907.0	906.9	906.9
	906.8	906.8	906.7	906.7	906.7	906.7	906.6	906.6	906.6	906.6
	906.6	906.6	906.5	906.5	906.4	906.4	906.4	906.3	906.2	905.9
	905.7	905.6	905.5	905.4	905.4					
0 7	906.7	906.8	907.1	907.6	908.1	908.0	907.5	907.2	907.1	906.9
	906.9	906.8	906.7	906.6	906.6	906.6	906.6	906.5	906.5	906.5
	906.5	906.4	906.4	906.3	906.3	906.2	906.2	906.1	906.0	905.8
	905.5	905.4	905.3	905.2	905.2					
0 8	906.6	906.7	907.1	907.7	908.4	908.3	907.8	907.3	907.1	906.9
	906.8	906.7	906.6	906.5	906.5	906.5	906.4	906.4	906.4	906.3
	906.3	906.3	906.2	906.2	906.1	906.1	906.0	906.0	905.9	905.7
	905.5	905.3	905.2	905.2	905.1					
0 9	906.5	906.7	907.1	907.7	908.5	908.5	907.9	907.4	907.1	906.9
	906.8	906.7	906.5	906.4	906.4	906.3	906.3	906.3	906.2	906.2
	906.2	906.1	906.1	906.0	906.0	906.0	905.9	905.9	905.8	905.6
	905.4	905.3	905.2	905.1	905.1					
0 10	906.5	906.7	907.1	907.8	908.7	908.7	908.0	907.5	907.2	906.9
	906.8	906.6	906.4	906.3	906.3	906.2	906.2	906.1	906.1	906.1
	906.0	906.0	906.0	905.9	905.9	905.9	905.9	905.8	905.8	905.6
	905.4	905.2	905.2	905.1	905.1					
0 11	906.4	906.6	907.1	907.8	908.8	908.8	908.1	907.5	907.2	906.9
	906.7	906.6	906.4	906.2	906.2	906.1	906.1	906.0	906.0	905.9
	905.9	905.9	905.9	905.8	905.8	905.8	905.8	905.8	905.7	905.5
	905.4	905.2	905.1	905.1	905.1					
0 12	906.4	906.6	907.1	907.8	908.9	908.9	908.3	907.6	907.2	906.9
	906.7	906.5	906.3	906.1	906.0	906.0	905.9	905.9	905.8	905.8
	905.8	905.8	905.8	905.8	905.8	905.8	905.8	905.7	905.7	905.5
	905.3	905.2	905.1	905.1	905.0					
0 13	906.4	906.6	907.0	907.8	909.0	909.0	908.4	907.7	907.3	906.9
	906.7	906.4	906.2	906.0	905.9	905.8	905.7	905.6	905.6	905.6
	905.6	905.6	905.6	905.7	905.7	905.7	905.7	905.7	905.7	905.5
	905.3	905.2	905.1	905.1	905.0					
0 14	906.3	906.6	907.0	907.8	909.1	909.1	908.5	907.7	907.3	906.9
	906.7	906.4	906.1	905.8	905.7	905.5	905.4	905.4	905.3	905.4
	905.4	905.4	905.5	905.6	905.6	905.7	905.7	905.7	905.6	905.5
	905.3	905.2	905.1	905.0	905.0					
0 15	906.3	906.5	907.0	907.8	909.1	909.2	908.6	907.8	907.3	907.0
	906.7	906.4	906.1	905.7	905.5	905.4	905.2	905.1	905.1	905.2
	905.2	905.3	905.4	905.5	905.6	905.6	905.7	905.7	905.6	905.5
	905.3	905.1	905.1	905.0	905.0					
0 16	906.3	906.5	907.0	907.8	909.2	909.2	908.7	907.8	907.4	907.0
	906.7	906.4	906.0	905.7	905.4	905.2	905.0	904.8	904.9	905.0
	905.1	905.3	905.4	905.5	905.6	905.6	905.7	905.7	905.6	905.5
	905.3	905.1	905.1	905.0	905.0					
0 17	906.3	906.5	907.0	907.8	909.2	909.3	908.7	907.9	907.4	907.0
	906.7	906.4	906.0	905.6	905.3	905.0	904.7	904.3	904.6	904.8
	905.0	905.2	905.4	905.5	905.6	905.6	905.7	905.7	905.6	905.4
	905.3	905.1	905.1	905.0	905.0					
0 18	906.3	906.5	907.0	907.8	909.3	909.3	908.8	907.9	907.4	907.0
	906.7	906.4	906.0	905.6	905.3	904.9	904.4	903.1	904.2	904.7
	905.0	905.2	905.4	905.5	905.6	905.6	905.6	905.6	905.6	905.4
	905.2	905.1	905.0	905.0	905.0					
0 19	906.3	906.5	907.0	907.8	909.3	909.4	908.9	907.9	907.4	907.0
	906.7	906.4	906.0	905.6	905.3	905.0	904.7	904.3	904.6	904.8
	905.0	905.2	905.4	905.5	905.6	905.6	905.6	905.6	905.6	905.4
	905.2	905.1	905.0	905.0	905.0					
0 20	906.3	906.5	907.0	907.8	909.4	909.5	909.0	908.0	907.5	907.0
	906.7	906.4	906.1	905.7	905.4	905.2	905.0	904.8	904.9	905.0
	905.1	905.2	905.4	905.5	905.6	905.6	905.6	905.6	905.6	905.4
	905.2	905.1	905.0	905.0	905.0					
0 21	906.2	906.5	906.9	907.8	909.5	909.5	909.0	908.0	907.5	907.1
	906.8	906.5	906.1	905.8	905.6	905.4	905.2	905.1	905.1	905.2
	905.2	905.3	905.4	905.5	905.6	905.6	905.6	905.6	905.6	905.4
	905.2	905.1	905.0	905.0	905.0					
0 22	906.2	906.4	906.9	907.8	909.5	909.6	909.2	908.1	907.5	907.1
	906.8	906.5	906.2	905.9	905.7	905.6	905.5	905.4	905.4	905.4
	905.4	905.4	905.5	905.6	905.6	905.6	905.6	905.6	905.6	905.4
	905.2	905.1	905.0	905.0	905.0					
0 23	906.2	906.4	906.9	907.8	909.7	909.7	909.4	908.2	907.6	907.2
	906.9	906.6	906.3	906.0	905.9	905.8	905.7	905.7	905.6	905.6
	905.6	905.6	905.6	905.6	905.6	905.6	905.6	905.6	905.5	905.4
	905.2	905.1	905.0	905.0	904.9					
0 24	906.1	906.4	906.9	907.8	909.8	909.9	909.7	908.3	907.7	907.2
	907.0	906.7	906.4	906.2	906.1	906.0	905.9	905.9	905.8	905.8
	905.8	905.7	905.7	905.7	905.7	905.7	905.6	905.6	905.5	905.3
	905.2	905.0	905.0	904.9	904.9					
0 25	906.1	906.3	906.8	907.8	910.0	910.0	910.0	908.4	907.7	907.3
	907.0	906.8	906.5	906.3	906.2	906.2	906.1	906.0	906.0	905.9
	905.9	905.9	905.8	905.8	905.7	905.7	905.6	905.6	905.5	905.3
	905.1	905.0	904.9	904.9	904.9					
0 26	906.0	906.3	906.8	907.8	910.0	910.0	910.0	908.4	907.8	907.4
	907.1	906.8	906.6	906.4	906.3	906.3	906.2	906.1	906.1	906.0
	906.0	905.9	905.9	905.8	905.8	905.7	905.7	905.6	905.5	905.3
	905.1	905.0	904.9	904.9	904.9					
0 27	906.0	906.2	906.7	907.7	910.0	910.0	910.0	908.5	907.8	907.4
	907.1	906.9	906.7	906.5	906.4	906.4	906.3	906.2	906.2	906.1
	906.1	906.0	906.0	906.0	905.8	905.7	905.7	905.6	905.4	905.2
	905.1	904.9	904.9	904.9	904.8					
0 28	905.9	906.1	906.6	907.6	910.0	910.0	910.0	908.4	907.7	907.4
	907.1	906.9	906.7	906.6	906.5	906.4	906.4	906.3	906.2	906.2
	906.1	906.1	906.0	905.9	905.8	905.7	905.7	905.6	905.4	905.2
	905.0	904.9	904.8	904.8	904.8					
0 29	905.7	905.9	906.4	907.3	908.9	909.0	908.6	907.8	907.4	907.1
	906.9	906.7	906.6	906.5	906.4	906.3	906.3	906.2	906.2	906.1
	906.1	906.0	905.9	905.9	905.8	905.7	905.6	905.5	905.3	905.0
	904.9	904.8	904.8	904.7	904.7					
0 30	905.1	905.3	905.7	906.3	907.0	907.0	906.6	906.2	906.1	905.9
	905.9	905.8	905.7	905.6	905.6	905.6	905.5	905.5	905.5	905.4
	905.4	905.4	905.3	905.3	905.2	905.1	905.1	905.0	904.8	904.6
	904.6	904.5	904.5	904.5	904.5					
0 31	904.1	904.2	904.5	904.7	904.9	904.8	904.6	904.4	904.3	904.2
	904.2	904.1	904.1	904.1	904.0	904.0	904.0	904.0	904.0	904.0
	903.9	903.9	903.9	903.9	903.9	903.8	903.8	903.8	903.8	904.0
	904.1	904.2	904.2	904.3	904.3					
0 32	903.0	903.1	903.2	903.2	903.0	902.9	902.7	902.6	902.5	902.4
	902.3	902.2	902.1	902.0	902.0	902.0	902.0	902.0	902.0	902.0

	902.0	902.0	902.0	902.0	902.0	902.0	902.0	902.0	902.0	903.0
	903.5	903.8	904.0	904.0	904.1					
0 33	901.7	901.9	902.0	901.8	901.0	901.0	901.0	902.0	902.0	902.0
	902.0	902.0	902.0	902.0	902.0	902.0	902.0	902.1	902.1	902.1
	902.1	902.1	902.1	902.1	902.2	902.2	902.2	902.3	902.4	902.8
	903.3	903.5	903.7	903.9	903.9					
0 34	900.0	901.0	901.0	901.0	901.1	901.3	901.5	901.7	901.8	901.8
	901.9	901.9	901.9	902.0	902.0	902.0	902.0	902.0	902.0	902.0
	902.1	902.1	902.1	902.1	902.2	902.2	902.2	902.3	902.4	902.7
	~~903.1~~	903.4	903.6	903.7	903.8					
0 35	900.4	900.8	900.9	901.0	901.2	901.4	901.6	901.7	901.8	901.9
	901.9	901.9	901.9	902.0	902.0	902.0	902.0	902.0	902.0	902.1
	902.1	902.1	902.1	902.1	~~902.2~~	902.2	902.2	902.3	902.4	902.7
	903.1	903.3	903.5	903.7	903.7					

1 DRAWDOWN IN LAYER 1 AT END OF TIME ~~STEP~~ 20 IN STRESS PERIOD 1

	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
	21	22	23	24	25	26	27	28	29	30
	31	32	33	34	35					
0 1	-26.95	-26.94	-26.93	-26.89	-26.84	-26.75	-26.66	-26.62	-26.60	-26.58
	-26.57	-26.56	-26.55	-26.54	-26.53	-26.53	-26.52	-26.52	-26.51	-26.51
	-26.50	-26.50	-26.49	-26.48	-26.46	-26.45	-26.43	-26.41	-26.36	-26.25
	-26.12	-26.01	-25.92	-25.86	-25.83					
0 2	-26.95	-26.95	-26.94	-26.92	-26.87	-26.78	-26.68	-26.64	-26.61	-26.60
	-26.58	-26.57	-26.56	-26.55	-26.54	-26.54	-26.53	-26.53	-26.52	-26.52
	-26.51	-26.51	-26.49	-26.48	-26.47	-26.46	-26.44	-26.41	-26.36	-26.24
	-26.10	-25.99	-25.89	-25.83	-25.80					
0 3	-26.96	-26.97	-26.98	-26.97	-26.93	-26.84	-26.73	-26.68	-26.65	-26.63
	-26.61	-26.60	-26.58	-26.57	-26.56	-26.56	-26.55	-26.55	-26.54	-26.53
	-26.53	-26.52	-26.51	-26.49	-26.48	-26.46	-26.44	-26.41	-26.35	-26.22
	-26.06	-25.93	-25.84	-25.77	-25.74					
0 4	-26.95	-26.98	-27.03	-27.07	-27.05	-26.96	-26.82	-26.75	-26.71	-26.68
	-26.66	-26.64	-26.63	-26.61	-26.60	-26.59	-26.58	-26.58	-26.57	-26.56
	-26.55	-26.54	-26.53	-26.51	-26.49	-26.47	-26.44	-26.40	-26.33	-26.17
	-25.99	-25.85	-25.75	-25.68	-25.65					
0 5	-26.92	-26.98	-27.09	-27.20	-27.25	-27.16	-26.96	-26.86	-26.80	-26.76
	-26.74	-26.71	-26.68	-26.66	-26.65	-26.63	-26.62	-26.61	-26.60	-26.59
	-26.58	-26.57	-26.54	-26.52	-26.49	-26.46	-26.43	-26.37	-26.28	-26.08
	-25.88	-25.73	-25.62	-25.55	-25.52					
0 6	-26.82	-26.93	-27.14	-27.41	-27.60	-27.51	-27.20	-27.03	-26.94	-26.87
	-26.82	-26.78	-26.73	-26.70	-26.68	-26.66	-26.64	-26.63	-26.61	-26.59
	-26.58	-26.55	-26.52	-26.48	-26.44	-26.41	-26.35	-26.29	-26.16	-25.93
	-25.72	-25.56	-25.46	-25.39	-25.36					
0 7	-26.66	-26.82	-27.14	-27.61	-28.07	-28.02	-27.53	-27.22	-27.06	-26.94
	-26.86	-26.78	-26.70	-26.65	-26.61	-26.58	-26.56	-26.53	-26.50	-26.48
	-26.45	-26.42	-26.38	-26.33	-26.28	-26.23	-26.17	-26.10	-25.97	-25.75
	-25.55	-25.40	-25.30	-25.24	-25.22					
0 8	-26.57	-26.75	-27.12	-27.70	-28.36	-28.35	-27.77	-27.35	-27.12	-26.94
	-26.83	-26.72	-26.61	-26.53	-26.49	-26.45	-26.42	-26.38	-26.35	-26.32
	-26.29	-26.26	-26.21	-26.16	-26.11	-26.07	-26.02	-25.96	-25.86	-25.66
	-25.46	-25.32	-25.23	-25.17	-25.15					
0 9	-26.51	-26.70	-27.10	-27.74	-28.53	-28.53	-27.91	-27.42	-27.15	-26.94
	-26.80	-26.67	-26.54	-26.44	-26.39	-26.35	-26.31	-26.27	-26.23	-26.20
	-26.17	-26.14	-26.09	-26.04	-26.01	-25.97	-25.93	-25.89	-25.80	-25.61
	-25.42	-25.28	-25.19	-25.14	-25.11					
0 10	-26.47	-26.66	-27.08	-27.77	-28.66	-28.68	-28.05	-27.49	-27.18	-26.93
	-26.77	-26.60	-26.45	-26.33	-26.27	-26.22	-26.18	-26.13	-26.10	-26.07
	-26.04	-26.01	-25.97	-25.93	-25.91	-25.89	-25.86	-25.83	-25.75	-25.57
	-25.38	-25.25	-25.16	-25.11	-25.08					
0 11	-26.44	-26.64	-27.07	-27.79	-28.76	-28.79	-28.15	-27.54	-27.20	-26.93
	-26.74	-26.56	-26.38	-26.24	-26.17	-26.11	-26.06	-26.02	-25.98	-25.95
	-25.92	-25.90	-25.87	-25.85	-25.83	-25.82	-25.81	-25.79	-25.72	-25.55
	-25.36	-25.22	-25.14	-25.09	-25.07					
0 12	-26.41	-26.61	-27.05	-27.81	-28.87	-28.90	-28.26	-27.61	-27.23	-26.93
	-26.72	-26.50	-26.29	-26.13	-26.03	-25.97	-25.91	-25.86	-25.82	-25.80
	-25.78	-25.76	-25.75	-25.75	-25.76	-25.76	-25.76	-25.75	-25.70	-25.52
	-25.33	-25.20	-25.12	-25.07	-25.05					
0 13	-26.37	-26.58	-27.03	-27.82	-28.98	-29.02	-28.39	-27.68	-27.27	-26.93
	-26.69	-26.44	-26.18	-25.98	-25.86	-25.77	-25.70	-25.64	-25.61	-25.59
	-25.58	-25.59	-25.62	-25.66	-25.69	-25.70	-25.72	-25.71	-25.67	-25.50
	-25.31	-25.18	-25.10	-25.05	-25.03					
0 14	-26.34	-26.55	-27.01	-27.83	-29.07	-29.12	-28.51	-27.74	-27.31	-26.94
	-26.68	-26.40	-26.10	-25.83	-25.67	-25.54	-25.44	-25.37	-25.34	-25.35
	-25.38	-25.43	-25.51	-25.58	-25.63	-25.67	-25.69	-25.69	-25.65	-25.47
	-25.29	-25.16	-25.08	-25.04	-25.02					
0 15	-26.33	-26.54	-27.00	-27.83	-29.13	-29.19	-28.59	-27.79	-27.33	-26.95
	-26.68	-26.39	-26.05	-25.74	-25.53	-25.36	-25.21	-25.11	-25.11	-25.17
	-25.24	-25.33	-25.45	-25.55	-25.61	-25.65	-25.67	-25.68	-25.63	-25.46
	-25.28	-25.15	-25.07	-25.03	-25.01					
0 16	-26.31	-26.52	-26.99	-27.83	-29.18	-29.24	-28.65	-27.82	-27.36	-26.97
	-26.69	-26.38	-26.02	-25.67	-25.42	-25.20	-24.97	-24.82	-24.87	-25.00
	-25.12	-25.25	-25.41	-25.52	-25.59	-25.63	-25.66	-25.66	-25.62	-25.45
	-25.26	-25.14	-25.06	-25.02	-25.00					
0 17	-26.30	-26.51	-26.98	-27.84	-29.24	-29.29	-28.72	-27.86	-27.38	-26.98
	-26.70	-26.38	-26.01	-25.63	-25.32	-25.03	-24.66	-24.30	-24.56	-24.82
	-25.02	-25.20	-25.38	-25.51	-25.58	-25.62	-25.65	-25.66	-25.61	-25.44
	-25.25	-25.13	-25.05	-25.01	-24.99					
0 18	-26.28	-26.50	-26.97	-27.84	-29.29	-29.35	-28.80	-27.91	-27.41	-27.00
	-26.71	-26.38	-26.00	-25.61	-17.28	-24.93	-24.35	-23.13	-24.25	-24.72
	-24.97	-25.18	-25.37	-25.50	-25.57	-25.61	-25.65	-25.65	-25.60	-25.43
	-25.24	-25.12	-25.05	-25.00	-24.98					
0 19	-26.27	-26.48	-26.96	-27.84	-29.34	-29.40	-28.88	-27.95	-27.44	-27.02
	-26.73	-26.40	-26.02	-17.64	-25.33	-25.04	-24.67	-24.30	-24.56	-24.83
	-25.02	-25.20	-25.38	-25.50	-25.57	-25.61	-25.64	-25.64	-25.59	-25.42
	-25.23	-25.11	-25.04	-24.99	-24.98					
0 20	-26.25	-26.47	-26.95	-27.84	-29.40	-29.46	-28.96	-27.99	-27.47	-27.04
	-26.75	-26.42	-26.05	-25.70	-25.44	-25.21	-24.98	-24.82	-24.88	-25.00
	-25.12	-25.25	-25.40	-25.51	-25.57	-25.61	-25.64	-25.63	-25.58	-25.41
	-25.22	-25.10	-25.03	-24.99	-24.97					
0 21	-26.24	-26.45	-26.94	-27.84	-29.46	-29.52	-29.05	-28.04	-27.50	-27.07
	-26.77	-26.45	-26.10	-25.77	-25.56	-25.38	-25.23	-25.13	-25.12	-25.17
	-25.23	-25.32	-25.43	-25.53	-25.58	-25.61	-25.63	-25.63	-25.57	-25.40
	-25.21	-25.09	-25.02	-24.98	-24.96					
0 22	-26.22	-26.43	-26.92	-27.84	-29.53	-29.59	-29.16	-28.09	-27.54	-27.11
	-26.81	-26.50	-26.16	-25.88	-25.70	-25.57	-25.46	-25.38	-25.35	-25.35

	-25.38	-25.42	-25.49	-25.55	-25.59	-25.62	-25.63	-25.62	-25.56	-25.38
	-25.20	-25.08	-25.01	-24.97	-24.95					
0 23	-26.18	-26.40	-26.90	-27.83	-29.65	-29.70	-29.36	-28.19	-27.60	-27.16
	-26.87	-26.58	-26.28	-26.04	-25.91	-25.81	-25.73	-25.66	-25.62	-25.59
	-25.58	-25.57	-25.59	-25.61	-25.62	-25.63	-25.63	-25.61	-25.55	-25.36
	-25.18	-25.06	-24.99	-24.95	-24.94					
0 24	-26.14	-26.36	-26.86	-27.82	-29.82	-29.85	-29.66	-28.30	-27.68	-27.24
	-26.95	-26.68	-26.41	-26.21	-26.10	-26.02	-25.94	-25.88	-17.83	-25.79
	-25.76	-25.73	-25.70	-25.68	-25.67	-25.66	-25.64	-25.61	-25.52	-25.33
	-25.15	-25.04	-24.97	-24.93	-24.92					
0 25	-26.10	-26.32	-26.82	-27.80	0.0000E+00	0.0000E+00	0.0000E+00	-28.40	-27.74	-27.30
	-27.03	-26.76	-26.52	-26.34	-26.24	-26.16	-26.10	-26.03	-25.98	-25.93
	-25.89	-25.85	-25.80	-25.75	-25.72	-25.69	-25.65	-25.60	-25.50	-25.30
	-25.12	-25.01	-24.95	-24.91	-24.90					
0 26	-26.05	-26.27	-26.78	-27.77	0.0000E+00	0.0000E+00	0.0000E+00	-28.45	-27.78	-27.35
	-27.08	-26.83	-26.60	-26.43	-26.34	-26.27	-26.20	-26.14	-26.08	-26.03
	-25.99	-25.94	-25.87	-25.81	-25.76	-25.71	-25.66	-25.60	-25.48	-25.27
	-25.09	-24.99	-24.93	-24.89	-24.88					
0 27	-25.98	-26.20	-26.71	-27.71	0.0000E+00	0.0000E+00	0.0000E+00	-28.47	-27.81	-27.39
	-27.13	-26.90	-26.68	-26.53	-26.44	-26.37	-26.31	-26.25	-26.19	-26.14
	-26.09	-26.03	-25.95	-25.87	-25.80	-25.74	-25.67	-25.58	-25.45	-25.23
	-25.05	-24.95	-24.89	-24.86	-24.85					
0 28	-25.88	-26.10	-26.61	-27.59	0.0000E+00	0.0000E+00	0.0000E+00	-28.38	-27.74	-27.35
	-27.12	-26.90	-26.70	-26.56	-26.47	-26.41	-26.35	-26.29	-26.24	-26.18
	-26.14	-26.08	-25.99	-25.90	-25.82	-25.75	-25.66	-25.56	-25.40	-25.16
	-24.99	-24.90	-24.84	-24.82	-24.81					
0 29	-25.66	-17.88	-26.37	-27.27	-28.91	-29.02	-28.56	-27.76	-27.36	-19.08
	-26.90	-26.74	-26.58	-26.46	-26.39	-26.34	-26.28	-26.23	-26.18	-26.14
	-26.09	-26.03	-25.95	-25.85	-25.77	-25.69	-25.58	-25.47	-25.28	-25.03
	-24.87	-24.79	-24.75	-24.73	-24.73					
0 30	-25.08	-25.27	-25.66	-26.25	-26.96	-27.00	-26.56	-26.23	-26.06	-25.94
	-25.85	-25.77	-25.69	-25.62	-25.58	-25.55	-25.52	-25.49	-25.46	-25.44
	-25.41	-25.37	-25.32	-25.26	-25.20	-25.14	-25.06	-24.98	-24.83	-24.65
	-24.55	-24.53	-24.53	-24.54	-24.54					
0 31	-24.11	-24.24	-24.47	-24.72	-24.91	-24.84	-24.55	-24.38	-24.29	-24.22
	-24.18	-24.13	-24.09	-24.05	-24.03	-24.02	-24.00	-23.99	-23.98	-23.96
	-23.95	-23.93	-23.91	-23.88	-23.86	-23.84	-23.81	-23.79	-23.78	0.0000E+00
	-24.06	-24.16	-24.23	-24.28	-24.30					
0 32	-22.97	-23.10	-23.20	-23.21	-23.03	-22.90	-22.70	-22.57	-22.47	-22.37
	-22.29	-22.20	-22.09	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-23.01
	-23.53	-23.80	-23.95	-24.04	-24.08					
0 33	-21.66	-21.95	-22.00	-21.81	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	-22.02	-22.03	-22.03	-22.04	-22.05	-22.06	-22.07
	-22.08	-22.09	-22.11	-22.13	-22.15	-22.18	-22.22	-22.27	-22.40	-22.82
	-23.25	-23.55	-23.74	-23.85	-23.91					
0 34	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-21.12	-21.28	-21.53	-21.70	-21.78	-21.84
	-21.87	-21.91	-21.94	-21.97	-21.98	-22.00	-22.01	-22.02	-22.04	-22.05
	-22.06	-22.08	-22.10	-22.13	-22.17	-22.20	-22.25	-22.31	-22.44	-22.75
	-23.11	-23.40	-23.59	-23.72	-23.78					
0 35	-20.39	-20.78	-20.94	-21.04	-21.18	-21.39	-21.63	-21.75	-21.81	-21.86
	-21.89	-21.92	-21.95	-21.97	-21.99	-22.00	-22.02	-22.03	-22.04	-22.05
	-22.07	-22.08	-22.11	-22.14	-22.17	-22.20	-22.25	-22.31	-22.44	-22.71
	-23.05	-23.32	-23.52	-23.65	-23.72					

0

VOLUMETRIC BUDGET FOR ENTIRE MODEL AT END OF TIME STEP 20 IN STRESS PERIOD 1

	CUMULATIVE VOLUMES	L**3	RATES FOR THIS TIME STEP	L**3/T
0				
	IN:		IN:	
	STORAGE =	0.00000E+00	STORAGE =	0.00000E+00
	CONSTANT HEAD =	16327.	CONSTANT HEAD =	0.94487E-02
	WELLS =	0.00000E+00	WELLS =	0.00000E+00
0	TOTAL IN =	16327.	TOTAL IN =	0.94487E-02
0	OUT:		OUT:	
	STORAGE =	0.00000E+00	STORAGE =	0.00000E+00
	CONSTANT HEAD =	12875.	CONSTANT HEAD =	0.74510E-02
	WELLS =	3456.0	WELLS =	0.20000E-02
0	TOTAL OUT =	16331.	TOTAL OUT =	0.94510E-02
0	IN - OUT =	-4.4746	IN - OUT =	-0.23786E-05
0	PERCENT DISCREPANCY =	-0.03	PERCENT DISCREPANCY =	-0.03

0

TIME SUMMARY AT END OF TIME STEP 20 IN STRESS PERIOD 1

	SECONDS	MINUTES	HOURS	DAYS	YEARS
TIME STEP LENGTN	86400.0	1440.00	24.0000	1.00000	0.273785E-02
STRESS PERIOD TIME	0.172800E+07	28800.0	480.000	20.0000	0.547570E-01
TOTAL SIMULATION TIME	0.172800E+07	28800.0	480.000	20.0000	0.547570E-01

1

ZSR - FINAL
NO WELL

```
1                            U.S. GEOLOGICAL SURVEY MODULAR FINITE-DIFFERENCE GROUND-WATER MODEL
0BONMOD1 1 layer, 35 rows, 35 columns, 0 well                                         unconfined, impermeable bedrock TEST RUN
   1 LAYERS          35 ROWS         35 COLUMNS
   1 STRESS PERIOD(S) IN SIMULATION
 MODEL TIME UNIT IS SECONDS
0I/O UNITS:
 ELEMENT OF IUNIT:  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
         I/O UNIT: 11  0  0  0  0  0  0 19  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0BAS1 -- BASIC MODEL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT  1
 ARRAYS RHS AND BUFF WILL SHARE MEMORY.
 START HEAD WILL BE SAVED
    11099 ELEMENTS IN X ARRAY ARE USED BY BAS
    11099 ELEMENTS OF X ARRAY USED OUT OF    30000
0BCF1 -- BLOCK-CENTERED FLOW PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 11
 STEADY-STATE SIMULATION
      LAYER  AQUIFER TYPE
      -------------------
         1          1
     2451 ELEMENTS IN X ARRAY ARE USED BY BCF
    13550 ELEMENTS OF X ARRAY USED OUT OF    30000
0SIP1 -- STRONGLY IMPLICIT PROCEDURE SOLUTION PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 19
 MAXIMUM OF 100 ITERATIONS ALLOWED FOR CLOSURE
  5 ITERATION PARAMETERS
     5305 ELEMENTS IN X ARRAY ARE USED BY SIP
    18855 ELEMENTS OF X ARRAY USED OUT OF    30000
1BONMOD1 1 layer, 35 rows, 35 columns, 0 well                                         unconfined, impermeable bedrock TEST RUN
0
```

BOUNDARY ARRAY FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35I2)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
0 1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 25	1	1	1	1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 26	1	1	1	1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 27	1	1	1	1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 28	1	1	1	1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1	1	1
0 32	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	1	1	1	1	1	1
0 33	1	1	1	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 34	-1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 35	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

0AQUIFER HEAD WILL BE SET TO 999.90   AT ALL NO-FLOW NODES (IBOUND=0).
0

INITIAL HEAD FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35F5.0)

	1 16 31	2 17 32	3 18 33	4 19 34	5 20 35	6 21	7 22	8 23	9 24	10 25	11 26	12 27	13 28	14 29	15 30
0 1	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 2	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 3	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 4	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 5	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 6	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 7	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 8	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 9	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 10	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 11	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 12	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 13	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 14	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 15	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 16	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 17	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 18	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 19	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 20	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 21	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 22	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 23	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 24	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	888.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 25	880.0	880.0	880.0	880.0	910.0	910.0	910.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 26	880.0	880.0	880.0	880.0	910.0	910.0	910.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 27	880.0	880.0	880.0	880.0	910.0	910.0	910.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 28	880.0	880.0	880.0	880.0	910.0	910.0	910.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 29	880.0	888.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 30	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 31	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	904.0
	880.0	880.0	880.0	880.0	880.0										
0 32	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	902.0	902.0
	902.0	902.0	902.0	902.0	902.0	902.0	902.0	902.0	902.0	902.0	902.0	902.0	902.0	902.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 33	880.0	880.0	880.0	880.0	901.0	901.0	901.0	902.0	902.0	902.0	902.0	902.0	902.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 34	900.0	901.0	901.0	901.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0

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        880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0
0 35    880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0
0DEFAULT OUTPUT CONTROL -- THE FOLLOWING OUTPUT COMES AT THE END OF EACH STRESS PERIOD:
 TOTAL VOLUMETRIC BUDGET
          HEAD
          DRAWDOWN
0                                           COLUMN TO ROW ANISOTROPY =   1.000000
0

                                         DELR WILL BE READ ON UNIT 11 USING FORMAT:            (35F6.3)
                              ------------------------------------------------------------------------------------

   60.000       60.000       60.000       60.000       60.000       60.000       30.000       10.000       10.000       5.0000
   5.0000       5.0000       5.0000       3.0000       2.0000       2.0000       2.0000       2.0000       2.0000       2.0000
   2.0000       3.0000       5.0000       5.0000       5.0000       5.0000       10.000       10.000       30.000       60.000
   60.000       60.000       60.000       60.000       60.000
0

                                         DELC WILL BE READ ON UNIT 11 USING FORMAT:            (35F6.3)
                              ------------------------------------------------------------------------------------

   60.000       60.000       60.000       60.000       60.000       60.000       30.000       10.000       10.000       5.0000
   5.0000       5.0000       5.0000       3.0000       2.0000       2.0000       2.0000       2.0000       2.0000       2.0000
   2.0000       3.0000       5.0000       5.0000       5.0000       5.0000       10.000       10.000       30.000       60.000
   60.000       60.000       60.000       60.000       60.000
0                                                HYD. COND. ALONG ROWS =  0.1100000E-04 FOR LAYER  1
0                                                               BOTTOM =   865.0000     FOR LAYER  1
0

                                                     SOLUTION BY THE STRONGLY IMPLICIT PROCEDURE
                                                     -------------------------------------------
0                                           MAXIMUM ITERATIONS ALLOWED FOR CLOSURE =       100
                                                          ACCELERATION PARAMETER =      1.0000
                                               HEAD CHANGE CRITERION FOR CLOSURE =    0.10000E-02
                                               SIP HEAD CHANGE PRINTOUT INTERVAL =         1
0
    5 ITERATION PARAMETERS CALCULATED FROM SPECIFIED WSEED = 0.00100000 :

         0.0000000E+00  0.8221720E+00  0.9683772E+00  0.9943766E+00  0.9990000E+00
1                                              STRESS PERIOD NO.   1, LENGTH =    1728000.
                                               ---------------------------------------------

                                               NUMBER OF TIME STEPS =     20

                                                MULTIPLIER FOR DELT =      1.000

                                             INITIAL TIME STEP SIZE =   86400.00
0
    42 ITERATIONS FOR TIME STEP   1 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
    27.82       (  1, 24,  5)   11.76      (  1, 31,  4)   12.99      (  1, 22,  9)   14.74      (  1,  1,  2)   17.98      (  1,  7, 14)
    4.978       (  1,  9,  7)   4.168      (  1, 12,  8)   3.730      (  1, 21, 10)   10.07      (  1, 20, 10)   3.828      (  1, 12, 18)
   0.8994       (  1,  6,  8) -0.7155      (  1, 20, 10)  -1.743      (  1, 20, 10) -0.7537      (  1, 16, 12)  -1.862      (  1, 10, 12)
   0.4532       (  1,  7,  8)  0.4166      (  1,  9, 10)  0.2685      (  1, 14, 16)  0.7985      (  1, 13, 15)  0.6399      (  1, 24, 13)
  -0.1428       (  1, 29,  8) -0.6279E-01 (  1, 28, 10) -0.1019      (  1, 16, 19) -0.1831      (  1, 20, 17) -0.2802      (  1, 13,  9)
   0.4919E-01 (  1,  9,  7)  0.3670E-01 (  1, 11,  8)  0.3082E-01 (  1,  9,  9)  0.1043      (  1, 17, 10)  0.8159E-01 (  1, 13, 22)
  -0.1117E-01 (  1, 30,  8) -0.6614E-02 (  1, 28, 10) -0.1268E-01 (  1, 26, 12) -0.1321E-01 (  1, 25, 14) -0.2628E-01 (  1, 10, 11)
   0.5524E-02 (  1,  7,  7)  0.4167E-02 (  1,  8,  8)  0.3091E-02 (  1, 10,  9)  0.9740E-02 (  1, 13, 13)  0.8609E-02 (  1, 11, 25)
  -0.1708E-02 (  1, 29,  8) -0.8531E-03 (  1, 28, 10)
0
     1 ITERATIONS FOR TIME STEP   2 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.2493E-03 (  1, 29, 13)
0
     1 ITERATIONS FOR TIME STEP   3 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.1394E-03 (  1, 28, 12)
0
     1 ITERATIONS FOR TIME STEP   4 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.1096E-03 (  1, 19, 18)
0
     1 ITERATIONS FOR TIME STEP   5 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.1038E-03 (  1, 19, 18)
0
     1 ITERATIONS FOR TIME STEP   6 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
  -0.9822E-04 (  1, 19, 18)
0
     1 ITERATIONS FOR TIME STEP   7 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
  -0.9311E-04 (  1, 19, 18)
0
     1 ITERATIONS FOR TIME STEP   8 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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-0.8845E-04 (1, 20, 17)
0

1 ITERATIONS FOR TIME STEP 9 IN STRESS PERIOD 1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL

-0.8425E-04 (1, 20, 17)
0

1 ITERATIONS FOR TIME STEP 10 IN STRESS PERIOD 1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL

-0.8026E-04 (1, 20, 17)
0

1 ITERATIONS FOR TIME STEP 11 IN STRESS PERIOD 1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL

-0.7650E-04 (1, 20, 17)
0

1 ITERATIONS FOR TIME STEP 12 IN STRESS PERIOD 1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL

-0.7299E-04 (1, 20, 17)
0

1 ITERATIONS FOR TIME STEP 13 IN STRESS PERIOD 1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL

-0.6966E-04 (1, 20, 17)
0

1 ITERATIONS FOR TIME STEP 14 IN STRESS PERIOD 1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL

-0.6655E-04 (1, 20, 17)
0

1 ITERATIONS FOR TIME STEP 15 IN STRESS PERIOD 1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL

-0.6364E-04 (1, 20, 17)
0

1 ITERATIONS FOR TIME STEP 16 IN STRESS PERIOD 1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL

-0.6091E-04 (1, 20, 17)
0

1 ITERATIONS FOR TIME STEP 17 IN STRESS PERIOD 1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL

-0.5837E-04 (1, 20, 17)
0

1 ITERATIONS FOR TIME STEP 18 IN STRESS PERIOD 1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL

-0.5600E-04 (1, 20, 17)
0

1 ITERATIONS FOR TIME STEP 19 IN STRESS PERIOD 1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL

-0.5380E-04 (1, 20, 18)
0

1 ITERATIONS FOR TIME STEP 20 IN STRESS PERIOD 1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL

-0.5175E-04 (1, 20, 18)
0
1

HEAD IN LAYER 1 AT END OF TIME STEP 20 IN STRESS PERIOD 1

	1 11 21 31	2 12 22 32	3 13 23 33	4 14 24 34	5 15 25 35	6 16 26	7 17 27	8 18 28	9 19 29	10 20 30
0 1	907.4	907.4	907.4	907.4	907.3	907.3	907.2	907.2	907.2	907.2
	907.1	907.1	907.1	907.1	907.1	907.1	907.1	907.1	907.1	907.1
	907.1	907.1	907.1	907.1	907.1	907.0	907.0	907.0	907.0	906.9
	906.7	906.6	906.5	906.5	906.5					
0 2	907.4	907.4	907.4	907.4	907.4	907.3	907.2	907.2	907.2	907.2
	907.2	907.2	907.1	907.1	907.1	907.1	907.1	907.1	907.1	907.1
	907.1	907.1	907.1	907.1	907.1	907.1	907.0	907.0	907.0	906.9
	906.7	906.6	906.5	906.5	906.4					
0 3	907.4	907.4	907.4	907.4	907.4	907.4	907.3	907.3	907.2	907.2
	907.2	907.2	907.2	907.2	907.2	907.2	907.2	907.2	907.1	907.1
	907.1	907.1	907.1	907.1	907.1	907.1	907.1	907.0	907.0	906.9
	906.7	906.6	906.5	906.4	906.4					
0 4	907.3	907.4	907.4	907.5	907.5	907.5	907.4	907.3	907.3	907.3
	907.3	907.3	907.3	907.2	907.2	907.2	907.2	907.2	907.2	907.2
	907.2	907.2	907.2	907.2	907.1	907.1	907.1	907.1	907.0	906.8
	906.6	906.5	906.4	906.3	906.3					
0 5	907.3	907.3	907.5	907.6	907.7	907.7	907.6	907.5	907.5	907.4
	907.4	907.4	907.4	907.3	907.3	907.3	907.3	907.3	907.3	907.3
	907.3	907.3	907.3	907.2	907.2	907.2	907.1	907.1	907.0	906.8
	906.6	906.4	906.2	906.2	906.1					
0 6	907.1	907.2	907.5	907.7	908.0	908.0	907.8	907.7	907.7	907.6
	907.6	907.6	907.5	907.5	907.5	907.5	907.5	907.4	907.4	907.4
	907.4	907.4	907.4	907.3	907.3	907.2	907.2	907.1	907.0	906.7
	906.4	906.2	906.1	906.0	905.9					
0 7	906.9	907.1	907.4	907.9	908.4	908.5	908.2	908.0	907.9	907.9
	907.8	907.8	907.7	907.7	907.6	907.6	907.6	907.6	907.5	907.5

	907.5	907.5	907.4	907.4	907.3	907.3	907.2	907.1	906.9	906.6
	906.2	906.0	905.9	905.8	905.8					
0 8	906.8	907.0	907.4	907.9	908.6	908.7	908.4	908.2	908.1	908.0
	907.9	907.8	907.8	907.7	907.7	907.7	907.6	~~907.5~~	907.6	907.6
	907.5	907.5	907.5	907.4	907.3	907.3	907.2	907.1	906.9	906.5
	906.2	905.9	905.8	905.7	905.7					
0 9	906.8	906.9	907.3	908.0	908.8	908.9	908.6	908.3	908.2	908.0
	908.0	907.9	907.8	907.8	907.7	907.7	907.7	907.6	907.6	907.6
	907.6	907.5	907.5	907.4	907.3	907.3	907.2	907.1	906.8	906.4
	906.1	905.9	905.8	905.7	905.6					
0 10	906.7	906.9	907.3	908.0	908.9	909.0	908.7	908.4	908.2	908.1
	908.0	907.9	907.8	907.8	907.7	~~907.7~~	907.7	907.6	907.6	~~907.6~~
	907.6	907.5	907.5	907.4	907.3	907.3	907.2	907.0	906.8	906.4
	906.1	905.8	905.7	905.6	905.6					
0 11	906.7	906.9	907.3	908.0	908.9	909.1	908.7	908.4	908.3	908.1
	908.0	907.9	907.9	907.8	907.8	907.7	907.7	907.7	907.6	907.6
	907.6	907.5	907.5	907.4	907.3	907.2	907.1	907.0	906.8	906.4
	906.0	905.8	905.7	905.6	905.6					
0 12	906.6	906.8	907.3	908.0	909.0	909.2	908.8	908.5	908.3	908.2
	908.1	908.0	907.9	907.8	907.8	907.7	907.7	907.7	907.6	907.6
	907.6	907.5	907.5	907.4	907.3	907.2	907.1	907.0	906.8	906.3
	906.0	905.8	905.7	905.6	905.6					
0 13	906.6	906.8	907.2	908.0	909.1	909.3	908.9	908.5	908.3	908.2
	908.1	908.0	907.9	907.8	907.8	907.7	907.7	907.7	907.6	907.6
	907.6	907.5	907.4	907.4	907.3	907.2	907.1	907.0	906.7	906.3
	906.0	905.8	905.6	905.6	905.5					
0 14	906.6	906.8	907.2	~~908.0~~	909.2	909.3	909.0	908.6	908.4	908.2
	908.1	~~908.0~~	907.9	907.8	907.8	907.7	907.7	907.7	907.6	907.6
	907.5	907.5	907.4	~~907.4~~	907.3	907.2	907.1	907.0	906.7	906.3
	906.0	905.7	905.6	905.6	905.5					
0 15	906.5	906.7	907.2	908.0	909.3	909.4	909.1	908.6	908.4	908.2
	908.1	908.0	907.9	907.8	907.8	907.7	907.7	907.7	907.6	907.6
	907.5	907.5	907.4	907.3	907.3	907.2	907.1	906.9	906.7	906.3
	905.9	905.7	905.6	905.5	905.5					
0 16	906.5	906.7	907.2	908.0	909.3	909.4	909.1	908.6	908.4	908.2
	908.1	908.0	907.9	907.8	907.8	907.7	907.7	907.6	907.6	907.6
	907.5	907.5	907.4	907.3	907.3	907.2	907.1	906.9	906.7	906.3
	905.9	905.7	905.6	905.5	905.5					
0 17	906.5	906.7	907.2	908.0	909.3	909.5	909.2	908.7	908.4	908.2
	908.1	908.0	907.9	907.8	907.8	907.7	907.7	907.6	907.6	907.6
	907.5	907.5	907.4	907.3	907.3	907.2	907.1	906.9	906.7	906.2
	905.9	905.7	905.6	905.5	905.5					
0 18	906.5	906.7	907.2	908.0	909.4	909.5	909.2	~~908.7~~	908.4	908.2
	908.1	908.0	907.9	907.8	907.8	907.7	907.7	907.6	907.6	907.6
	907.5	907.5	907.4	907.3	907.2	907.2	907.1	~~906.9~~	906.7	906.2
	905.9	905.7	905.6	905.5	905.5					
0 19	906.5	906.7	907.2	908.0	909.4	909.6	909.3	908.7	908.5	908.3
	908.1	908.0	907.9	907.8	907.8	907.7	907.7	907.6	907.6	907.6
	907.5	907.5	907.4	907.3	907.2	907.2	907.0	906.9	906.7	906.2
	905.9	905.7	905.6	905.5	905.5					
0 20	906.5	906.7	907.1	908.0	909.5	909.6	909.3	908.7	908.5	908.3
	908.1	908.0	907.9	907.8	907.8	907.7	907.7	907.6	907.6	907.6
	907.5	907.5	907.4	907.3	907.2	907.1	907.0	906.9	906.6	906.2
	905.9	905.7	905.6	905.5	905.5					
0 21	906.4	906.7	907.1	908.0	909.5	909.6	909.4	908.8	908.5	908.3
	908.1	908.0	907.9	907.8	907.8	907.7	907.7	907.6	907.6	907.5
	907.5	907.5	907.4	907.3	907.2	907.1	907.0	906.9	906.6	906.2
	905.9	905.7	905.6	905.5	905.5					
0 22	906.4	906.6	907.1	~~908.0~~	909.6	909.7	909.4	908.8	908.5	908.3
	908.1	~~908.0~~	907.9	907.8	907.7	907.7	907.7	907.6	907.6	907.5
	907.5	907.4	907.4	~~907.3~~	907.2	907.1	907.0	906.9	906.6	906.2
	905.8	905.6	905.5	905.5	905.5					
0 23	906.4	906.6	907.1	908.0	909.7	909.8	909.6	908.9	908.5	908.3
	908.1	908.0	907.9	907.8	907.7	907.7	907.6	907.6	907.6	907.5
	907.5	907.4	907.3	907.3	907.2	907.1	907.0	906.8	906.6	906.1
	905.8	905.6	905.5	905.5	905.4					
0 24	906.3	906.6	907.0	908.0	909.8	909.9	909.8	908.9	908.5	908.3
	908.1	908.0	907.9	907.8	907.7	907.7	907.6	907.6	907.5	907.5
	907.4	907.4	907.3	907.2	907.1	907.1	906.9	906.8	906.5	906.1
	905.8	905.6	905.5	905.4	905.4					
0 25	906.3	906.5	907.0	907.9	910.0	910.0	910.0	908.9	908.5	908.3
	908.1	908.0	907.8	907.7	907.7	907.6	907.6	907.5	907.5	907.5
	907.4	907.4	907.3	907.2	907.1	907.0	906.9	906.7	906.5	906.1
	905.7	905.6	905.5	905.4	905.4					
0 26	906.2	906.5	906.9	907.9	910.0	910.0	910.0	909.0	908.5	908.3
	908.1	907.9	907.8	907.7	907.6	~~907.6~~	907.5	907.5	907.5	~~907.4~~
	907.4	907.3	907.2	907.1	907.0	907.0	906.8	906.7	906.4	906.0
	905.7	905.5	905.4	905.4	905.4					
0 27	906.2	906.4	906.9	907.8	910.0	910.0	910.0	908.9	908.5	908.2
	908.0	907.9	907.7	907.6	907.6	907.5	907.5	907.4	907.4	907.3
	907.3	907.2	907.2	907.1	907.0	906.9	906.8	906.6	906.4	905.9
	905.6	905.5	905.4	905.3	905.3					
0 28	906.1	906.3	906.8	907.7	910.0	910.0	910.0	908.8	908.3	908.1
	907.9	907.7	907.6	907.5	907.4	907.4	907.3	~~907.3~~	907.2	907.2
	907.2	907.1	907.0	906.9	906.8	906.8	906.6	906.5	906.3	905.8
	905.6	905.4	905.3	905.3	905.3					
0 29	905.8	906.0	906.5	907.4	908.9	909.1	908.7	908.1	907.8	907.6
	907.5	907.4	907.2	907.1	907.1	907.1	907.0	907.0	906.9	906.9
	906.8	906.8	906.7	906.6	906.6	906.5	906.4	906.2	906.0	905.6
	905.4	905.3	905.2	905.2	905.2					
0 30	905.2	905.4	905.8	906.3	907.0	907.1	906.8	906.5	906.4	906.3
	906.2	906.1	906.1	906.0	906.0	906.0	905.9	905.9	905.9	905.9
	905.8	905.8	905.8	905.7	905.6	905.6	905.5	905.4	905.3	905.0
	904.9	904.9	904.9	905.0	905.0					
0 31	904.2	904.3	904.5	904.8	905.0	904.9	904.7	904.5	904.4	904.4
	904.3	904.3	904.3	904.2	~~904.2~~	904.2	904.2	904.2	904.2	904.1
	~~904.1~~	904.1	904.1	904.1	904.0	904.0	904.0	903.9	903.9	904.0
	904.3	904.5	904.6	904.6	904.7					
0 32	~~903.0~~	903.2	903.3	903.3	903.1	902.9	902.7	902.6	902.5	902.4
	902.3	902.2	902.1	902.0	902.0	902.0	902.0	902.0	902.0	902.0
	902.0	902.0	902.0	902.0	902.0	902.0	902.0	902.0	902.0	903.1
	903.7	904.0	904.2	904.4	904.4					
0 33	901.7	902.0	902.0	901.8	901.0	901.0	901.0	902.0	902.0	902.0
	902.0	902.0	902.0	902.0	902.0	902.0	902.1	902.1	902.1	902.1
	902.1	902.1	902.1	902.1	902.2	902.2	902.2	902.3	902.5	902.9
	903.4	903.8	904.0	904.1	904.2					
0 34	900.0	901.0	901.0	901.0	901.1	901.3	901.5	901.7	901.8	901.9
	901.9	901.9	902.0	902.0	902.0	902.0	902.0	902.1	902.1	902.1

	902.1	902.1	902.1	902.2	902.2	902.2	902.3	902.4	902.5	902.8
	903.3	903.6	903.8	904.0	904.0					
0 35	900.4	900.8	900.9	901.0	901.2	901.4	901.7	901.8	901.8	901.9
	901.9	902.0	902.0	902.0	902.0	902.0	902.1	902.1	902.1	902.1
	902.1	902.1	902.2	902.2	902.2	902.3	902.3	902.4	902.5	902.8
	903.2	903.5	903.7	903.9	904.0					

1 DRAWDOWN IN LAYER 1 AT END OF TIME STEP 20 IN STRESS PERIOD 1

	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
	21	22	23	24	25	26	27	28	29	30
	31	32	33	34	35					
0 1	-27.37	-27.37	-27.37	-27.37	-27.34	-27.28	-27.22	-27.18	-27.17	-27.15
	-27.14	-27.13	-27.13	-27.12	-27.11	-27.11	-27.11	-27.10	-27.10	-27.09
	-27.09	-27.09	-27.08	-27.07	-27.06	-27.05	-27.03	-27.01	-26.97	-26.87
	-26.75	-26.64	-26.55	-26.49	-26.45					
0 2	-27.37	-27.38	-27.39	-27.39	-27.36	-27.31	-27.24	-27.21	-27.19	-27.17
	-27.16	-27.15	-27.14	-27.14	-27.13	-27.13	-27.12	-27.12	-27.11	-27.11
	-27.11	-27.10	-27.09	-27.08	-27.07	-27.06	-27.04	-27.02	-26.97	-26.87
	-26.73	-26.61	-26.52	-26.46	-26.42					
0 3	-27.36	-27.38	-27.40	-27.43	-27.42	-27.37	-27.30	-27.26	-27.24	-27.22
	-27.21	-27.20	-27.19	-27.18	-27.17	-27.16	-27.16	-27.15	-27.15	-27.14
	-27.14	-27.13	-27.12	-27.11	-27.10	-27.08	-27.06	-27.04	-26.98	-26.86
	-26.70	-26.57	-26.46	-26.39	-26.36					
0 4	-27.33	-27.37	-27.43	-27.50	-27.53	-27.49	-27.40	-27.35	-27.32	-27.30
	-27.29	-27.27	-27.25	-27.24	-27.23	-27.23	-27.22	-27.22	-27.21	-27.20
	-27.20	-27.19	-27.17	-27.16	-27.14	-27.12	-27.10	-27.06	-26.99	-26.84
	-26.65	-26.49	-26.37	-26.30	-26.26					
0 5	-27.26	-27.33	-27.45	-27.60	-27.70	-27.69	-27.57	-27.50	-27.46	-27.43
	-27.41	-27.39	-27.36	-27.35	-27.34	-27.33	-27.32	-27.31	-27.30	-27.29
	-27.28	-27.27	-27.25	-27.23	-27.20	-27.18	-27.14	-27.10	-27.00	-26.79
	-26.56	-26.37	-26.24	-26.16	-26.12					
0 6	-27.12	-27.24	-27.46	-27.75	-28.00	-28.02	-27.85	-27.74	-27.68	-27.63
	-27.60	-27.56	-27.53	-27.50	-27.48	-27.47	-27.46	-27.44	-27.43	-27.41
	-27.40	-27.38	-27.35	-27.32	-27.28	-27.25	-27.20	-27.13	-26.99	-26.71
	-26.42	-26.21	-26.06	-25.98	-25.94					
0 7	-26.93	-27.09	-27.41	-27.89	-28.38	-28.46	-28.21	-28.03	-27.93	-27.86
	-27.80	-27.75	-27.70	-27.66	-27.63	-27.61	-27.59	-27.57	-27.55	-27.52
	-27.50	-27.48	-27.44	-27.38	-27.33	-27.28	-27.21	-27.11	-26.93	-26.57
	-26.25	-26.03	-25.89	-25.81	-25.77					
0 8	-26.81	-26.99	-27.36	-27.94	-28.62	-28.73	-28.43	-28.20	-28.07	-27.98
	-27.91	-27.84	-27.78	-27.73	-27.69	-27.67	-27.64	-27.62	-27.59	-27.56
	-27.54	-27.51	-27.46	-27.40	-27.34	-27.28	-27.19	-27.08	-26.88	-26.49
	-26.15	-25.94	-25.80	-25.72	-25.69					
0 9	-26.75	-26.94	-27.33	-27.97	-28.75	-28.88	-28.56	-28.29	-28.15	-28.04
	-27.97	-27.89	-27.82	-27.76	-27.72	-27.69	-27.66	-27.64	-27.61	-27.58
	-27.55	-27.52	-27.46	-27.40	-27.33	-27.27	-27.18	-27.06	-26.84	-26.44
	-26.10	-25.89	-25.76	-25.68	-25.65					
0 10	-26.70	-26.89	-27.31	-27.98	-28.87	-29.00	-28.67	-28.37	-28.21	-28.09
	-28.01	-27.92	-27.84	-27.78	-27.74	-27.71	-27.68	-27.65	-27.62	-27.59
	-27.56	-27.52	-27.46	-27.39	-27.32	-27.26	-27.16	-27.04	-26.81	-26.40
	-26.06	-25.85	-25.72	-25.65	-25.61					
0 11	-26.67	-26.86	-27.29	-27.99	-28.95	-29.08	-28.74	-28.42	-28.25	-28.12
	-28.03	-27.95	-27.86	-27.79	-27.75	-27.72	-27.68	-27.65	-27.62	-27.59
	-27.56	-27.52	-27.46	-27.38	-27.31	-27.24	-27.14	-27.02	-26.79	-26.38
	-26.03	-25.82	-25.70	-25.62	-25.59					
0 12	-26.63	-26.83	-27.26	-28.00	-29.03	-29.17	-28.83	-28.48	-28.29	-28.15
	-28.06	-27.96	-27.87	-27.80	-27.76	-27.72	-27.69	-27.66	-27.62	-27.59
	-27.56	-27.52	-27.45	-27.38	-27.30	-27.23	-27.13	-27.00	-26.77	-26.35
	-26.00	-25.80	-25.67	-25.60	-25.57					
0 13	-26.59	-26.80	-27.24	-28.00	-29.13	-29.26	-28.92	-28.54	-28.34	-28.18
	-28.08	-27.98	-27.89	-27.81	-27.76	-27.73	-27.69	-27.66	-27.62	-27.59
	-27.55	-27.51	-27.45	-27.37	-27.29	-27.22	-27.11	-26.98	-26.74	-26.32
	-25.97	-25.77	-25.65	-25.58	-25.55					
0 14	-26.56	-26.77	-27.22	-28.01	-29.21	-29.34	-29.01	-28.59	-28.37	-28.21
	-28.10	-27.99	-27.89	-27.81	-27.77	-27.73	-27.69	-27.65	-27.62	-27.58
	-27.55	-27.50	-27.44	-27.35	-27.28	-27.20	-27.09	-26.96	-26.72	-26.29
	-25.95	-25.75	-25.63	-25.56	-25.53					
0 15	-26.54	-26.75	-27.20	-28.01	-29.26	-29.39	-29.06	-28.62	-28.39	-28.22
	-28.11	-28.00	-27.90	-27.82	-27.77	-27.73	-27.69	-27.65	-27.62	-27.58
	-27.54	-27.50	-27.43	-27.35	-27.27	-27.19	-27.08	-26.95	-26.70	-26.27
	-25.93	-25.73	-25.61	-25.55	-25.52					
0 16	-26.53	-26.73	-27.19	-28.01	-29.30	-29.43	-29.11	-28.65	-28.41	-28.23
	-28.12	-28.01	-27.90	-27.82	-27.77	-27.73	-27.69	-27.65	-27.61	-27.57
	-27.54	-27.49	-27.42	-27.34	-27.26	-27.18	-27.07	-26.94	-26.69	-26.26
	-25.92	-25.72	-25.60	-25.54	-25.51					
0 17	-26.51	-26.72	-27.18	-28.00	-29.34	-29.47	-29.16	-28.67	-28.42	-28.24
	-28.12	-28.01	-27.90	-27.82	-27.77	-27.72	-27.69	-27.65	-27.61	-27.57
	-27.53	-27.49	-27.42	-27.33	-27.25	-27.17	-27.06	-26.93	-26.68	-26.25
	-25.91	-25.71	-25.59	-25.53	-25.50					
0 18	-26.49	-26.70	-27.17	-28.00	-29.39	-29.51	-29.21	-28.70	-28.44	-28.25
	-28.13	-28.01	-27.90	-27.82	-19.76	-27.72	-27.68	-27.64	-27.60	-27.57
	-27.53	-27.48	-27.41	-27.32	-27.24	-27.16	-27.05	-26.91	-26.66	-26.23
	-25.90	-25.70	-25.58	-25.52	-25.49					
0 19	-26.48	-26.69	-27.15	-28.00	-29.44	-29.55	-29.26	-28.72	-28.45	-28.26
	-28.13	-28.02	-27.90	-19.81	-27.76	-27.72	-27.68	-27.64	-27.60	-27.56
	-27.52	-27.47	-27.40	-27.32	-27.23	-27.15	-27.04	-26.90	-26.65	-26.22
	-25.88	-25.69	-25.57	-25.51	-25.48					
0 20	-26.46	-26.67	-27.14	-28.00	-29.48	-29.59	-29.32	-28.75	-28.47	-28.27
	-28.14	-28.02	-27.90	-27.81	-27.76	-27.71	-27.67	-27.63	-27.59	-27.55
	-27.51	-27.47	-27.39	-27.31	-27.22	-27.14	-27.03	-26.89	-26.64	-26.20
	-25.87	-25.67	-25.56	-25.50	-25.47					
0 21	-26.44	-26.65	-27.13	-27.99	-29.53	-29.64	-29.37	-28.77	-28.48	-28.27
	-28.14	-28.02	-27.90	-27.81	-27.75	-27.71	-27.67	-27.63	-27.59	-27.55
	-27.51	-27.46	-27.38	-27.30	-27.21	-27.13	-27.02	-26.88	-26.62	-26.19
	-25.86	-25.66	-25.55	-25.49	-25.47					
0 22	-26.42	-26.63	-27.11	-27.99	-29.60	-29.69	-29.45	-28.81	-28.49	-28.28
	-28.15	-28.02	-27.89	-27.80	-27.75	-27.70	-27.66	-27.62	-27.58	-27.54
	-27.50	-27.45	-27.37	-27.28	-27.20	-27.12	-27.00	-26.86	-26.60	-26.17
	-25.84	-25.65	-25.54	-25.48	-25.45					
0 23	-26.38	-26.60	-27.08	-27.98	-29.70	-29.78	-29.58	-28.86	-28.52	-28.29
	-28.15	-28.01	-27.89	-27.79	-27.73	-27.69	-27.64	-27.60	-27.56	-27.52
	-27.48	-27.43	-27.35	-27.26	-27.17	-27.09	-26.97	-26.83	-26.57	-26.14
	-25.81	-25.62	-25.52	-25.46	-25.44					
0 24	-26.34	-26.55	-27.04	-27.96	-29.84	-29.89	-29.78	-28.91	-28.53	-28.29
	-28.14	-28.00	-27.87	-27.77	-27.71	-27.66	-27.62	-27.57	-19.53	-27.49

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        -27.44      -27.39      -27.32      -27.22      -27.13      -27.05      -26.93      -26.79      -26.53      -26.10
        -25.77      -25.59      -25.49      -25.44      -25.41
 0 25   -26.29      -26.51      -27.00      -27.93      0.0000E+00  0.0000E+00  0.0000E+00  -28.95      -28.54      -28.28
        -28.12      -27.98      -27.84      -27.74      -27.68      -27.63      -27.58      -27.54      -27.49      -27.45
        -27.41      -27.36      -27.28      -27.18      -27.09      -27.01      -26.89      -26.75      -26.49      -26.06
        -25.74      -25.56      -25.46      -25.41      -25.39
 0 26   -26.24      -26.46      -26.95      -27.89      0.0000E+00  0.0000E+00  0.0000E+00  -28.95      -28.52      -28.26
        -28.09      -27.94      -27.80      -27.70      -27.64      -27.59      -27.54      -27.50      -27.45      -27.41
        -27.36      -27.31      -27.23      -27.14      -27.05      -26.96      -26.84      -26.70      -26.44      -26.01
        -25.70      -25.53      -25.44      -25.39      -25.37
 0 27   -26.16      -26.38      -26.87      -27.83      0.0000E+00  0.0000E+00  0.0000E+00  -28.92      -28.47      -28.20
        -28.03      -27.88      -27.73      -27.63      -27.57      -27.52      -27.47      -27.42      -27.38      -27.33
        -27.29      -27.24      -27.16      -27.06      -26.97      -26.89      -26.77      -26.62      -26.36      -25.94
        -25.64      -25.48      -25.39      -25.35      -25.33
 0 28   -26.05      -26.27      -26.76      -27.70      0.0000E+00  0.0000E+00  0.0000E+00  -28.77      -28.32      -28.05
        -27.89      -27.74      -27.60      -27.49      -27.43      -27.38      -27.34      -27.29      -27.25      -27.20
        -27.16      -27.11      -27.03      -26.94      -26.85      -26.76      -26.65      -26.50      -26.25      -25.84
        -25.56      -25.41      -25.34      -25.30      -25.28
 0 29   -25.82      -18.03      -26.50      -27.38      -28.94      -29.07      -28.72      -28.12      -27.83      -19.62
        -27.49      -27.36      -27.24      -27.15      -27.09      -27.05      -27.01      -26.97      -26.93      -26.89
        -26.85      -26.80      -26.73      -26.64      -26.56      -26.48      -26.37      -26.24      -26.00      -25.62
        -25.39      -25.27      -25.22      -25.19      -25.18
 0 30   -25.21      -25.40      -25.77      -26.34      -27.03      -27.11      -26.77      -26.51      -26.38      -26.27
        -26.20      -26.14      -26.07      -26.02      -25.98      -25.96      -25.93      -25.91      -25.88      -25.86
        -25.83      -25.80      -25.75      -25.70      -25.64      -25.59      -25.52      -25.43      -25.27      -25.03
        -24.95      -24.93      -24.94      -24.95      -24.96
 0 31   -24.20      -24.34      -24.55      -24.80      -24.98      -24.94      -24.68      -24.53      -24.45      -24.39
        -24.34      -24.30      -24.26      -24.23      -24.21      -24.20      -24.18      -24.17      -24.15      -24.14
        -24.13      -24.11      -24.09      -24.06      -24.04      -24.01      -23.98      -23.95      -23.91      0.0000E+00
        -24.28      -24.46      -24.57      -24.64      -24.67
 0 32   -23.03      -23.16      -23.26      -23.25      -23.07      -22.95      -22.75      -22.61      -22.51      -22.40
        -22.31      -22.21      -22.10      0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00
        0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  -23.07
        -23.70      -24.04      -24.24      -24.35      -24.40
 0 33   -21.69      -21.98      -22.03      -21.83      0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00
        0.0000E+00  0.0000E+00  0.0000E+00  -22.02      -22.03      -22.04      -22.05      -22.06      -22.07      -22.08
        -22.09      -22.10      -22.12      -22.15      -22.18      -22.20      -22.25      -22.31      -22.45      -22.91
        -23.41      -23.76      -23.99      -24.13      -24.19
 0 34   0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  -21.12      -21.29      -21.54      -21.73      -21.81      -21.86
        -21.90      -21.94      -21.97      -22.00      -22.02      -22.03      -22.04      -22.06      -22.07      -22.09
        -22.10      -22.12      -22.14      -22.18      -22.21      -22.25      -22.30      -22.37      -22.51      -22.85
        -23.26      -23.59      -23.82      -23.97      -24.05
 0 35   -20.39      -20.78      -20.94      -21.04      -21.19      -21.40      -21.65      -21.78      -21.84      -21.89
        -21.92      -21.96      -21.99      -22.02      -22.03      -22.05      -22.06      -22.07      -22.09      -22.10
        -22.11      -22.13      -22.16      -22.19      -22.23      -22.26      -22.31      -22.38      -22.52      -22.82
        -23.20      -23.51      -23.74      -23.90      -23.97
 0

                       VOLUMETRIC BUDGET FOR ENTIRE MODEL AT END OF TIME STEP 20 IN STRESS PERIOD  1
                       ---------------------------------------------------------------------------
 0            CUMULATIVE VOLUMES      L**3                                  RATES FOR THIS TIME STEP      L**3/T
              ------------------                                            ------------------------

                    IN:                                                            IN:
                    ---                                                            ---
                       STORAGE =   0.00000E+00                                        STORAGE =   0.00000E+00
                 CONSTANT HEAD =    13894.                                      CONSTANT HEAD =   0.80407E-02
 0                    TOTAL IN =    13894.                                           TOTAL IN =   0.80407E-02
 0                  OUT:                                                           OUT:
                    ----                                                           ----
                       STORAGE =   0.00000E+00                                        STORAGE =   0.00000E+00
                 CONSTANT HEAD =    13899.                                      CONSTANT HEAD =   0.80433E-02
 0                   TOTAL OUT =    13899.                                          TOTAL OUT =   0.80433E-02
 0                    IN - OUT =   -4.7813                                           IN - OUT =  -0.25611E-05
 0         PERCENT DISCREPANCY =               -0.03                      PERCENT DISCREPANCY =               -0.03


 0


          TIME SUMMARY AT END OF TIME STEP 20 IN STRESS PERIOD  1
                                   SECONDS       MINUTES        HOURS          DAYS          YEARS
                             -----------------------------------------------------------------------
      TIME STEP LENGTH          86400.0        1440.00       24.0000        1.00000       0.273785E-02
    STRESS PERIOD TIME        0.172800E+07     28800.0       480.000        20.0000       0.547570E-01
  TOTAL SIMULATION TIME       0.172800E+07     28800.0       480.000        20.0000       0.547570E-01
 1
```

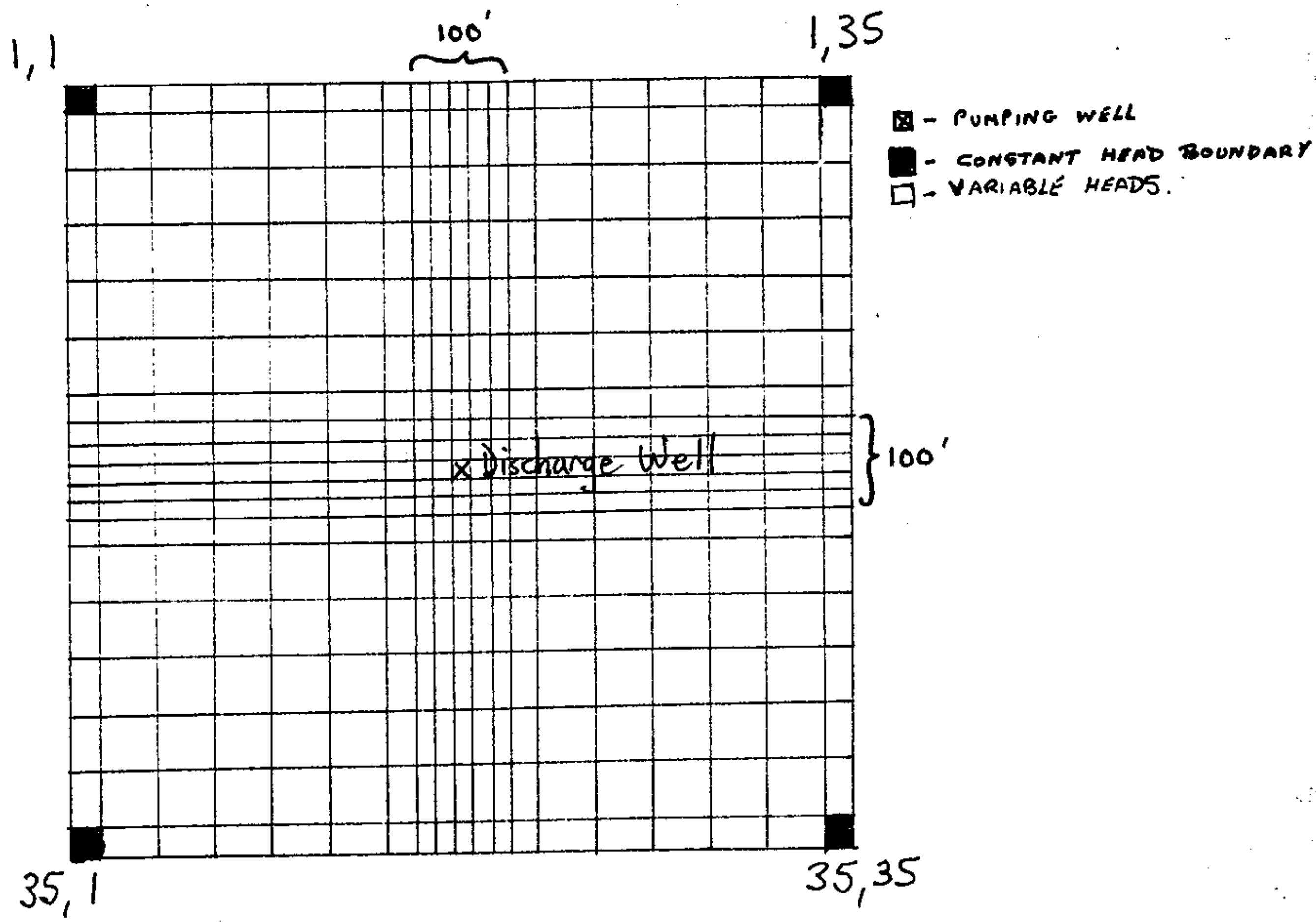
MODFLOW Simulation and Actual Head Comparisons including Simulated Discharge Drawdowns
Near 33D (proposed CAP well RW-1)
k=2.4x10e-3 ft/min   Q=1.5gpm
b = 10 to 35 feet

CELL NUMBER (i,j)	ACTUAL HEAD	SIMULATED STEADY-STATE HEAD	HEAD DIFFERENCE	SIMULATED PUMPING HEAD	SIMULATED DRAWDOWN	RADIAL DISTANCE	CONSTANT HEAD CELL
1,1	920	920	0	920	0	560	YES
1,35	928	928	0	928	0	560	YES
5,5	922.2	921.8	-0.4	920.5	-1.3	240	NO
5,31	923	924.1	1.1	922.9	-1.2	240	NO
8,8	920.8	922.4	1.6	920.4	-2	65	NO
8,28	920.8	923	2.2	921.1	-1.9	65	NO
10,10	920.7	922.5	1.8	920.2	-2.3	38	NO
10,26	920.7	922.9	2.2	920.7	-2.2	38	NO
14,14	920.6	922.6	2	919.7	-2.9	12	NO
14,22	920.6	922.7	2.1	919.8	-2.9	12	NO
18,18	920.5	922.6	2.1	917.7	-4.9	0	NO
22,14	920.5	922.6	2.1	919.6	-3	12	NO
22,22	920.6	922.7	2.1	919.8	-2.9	12	NO
26,10	920.4	922.4	2	920.1	-2.3	38	NO
26,26	920.7	922.8	2.1	920.6	-2.2	38	NO
28,8	920.2	922.2	2	920.2	-2	65	NO
28,28	922.5	922.9	0.4	921	-1.9	65	NO
31,5	917.5	920.5	3	919.1	-1.4	240	NO
31,31	924.9	924	-0.9	922.8	-1.2	240	NO
35,1	905	905	0	905	0	560	YES
35,35	930	930	0	930	0	560	YES

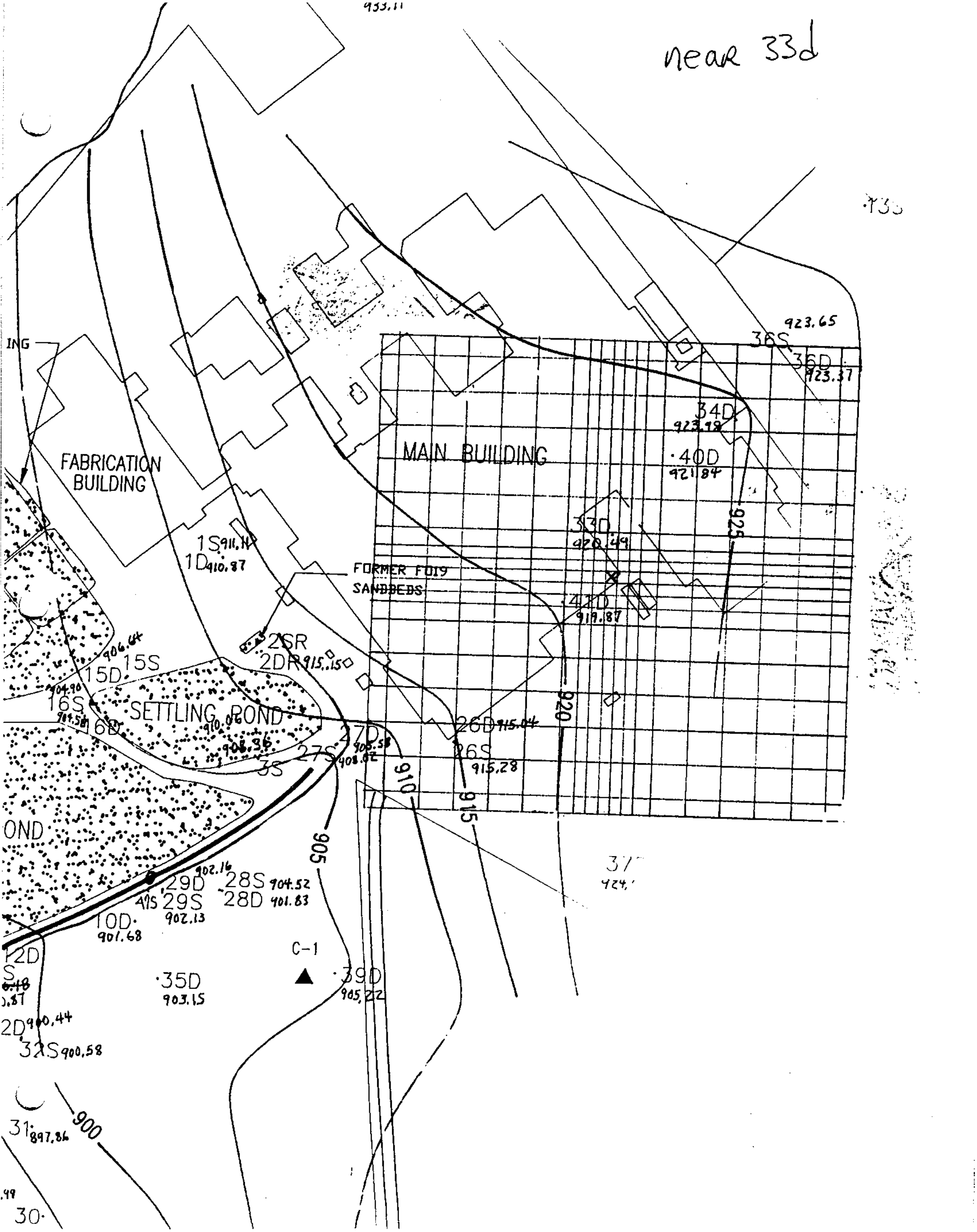
NOTES:
1. Cell Number - row then column for (i,j) notation.
2. Actual Head - interpolated from 8/21/91 water table map at block centered (i,j) location.
3. Simulated Steady-State Head - MODFLOW Simulated Head without discharge stress from pumping well.
4. Head Difference - MODFLOW Simulated Steady-State Head minus Actual Head.
5. Simulated Pumping Head - MODFLOW Simulated Head with discharge stress from pumping well located at (i,j)=(19,19).
6. Simulated Drawdown - MODFLOW Simulated Pumping Head minus MODFLOW Simulated Steady-State Head.
7. Radial Distance - (i,j) block centered distance from discharge (i,j) cell.
8. Constant Head Cell - cell that corresponds to known hydrogeologic constant head boundaries such as a stream or creek.
9. Estimated Recovery Head - Actual Head minus Simulated Drawdown.

Near 33D

MODFLOW
Constant head nodes



note: 2 ft cells omitted in interior area for clarity



near 33d
MAIN BUILDING
FABRICATION BUILDING
FORMER F019 SANDBEDS
SETTLING POND
ING
OND
36S 923.65
36D 923.37
34D 923.98
40D 921.84
33D 920.49
41D 919.87
1S 911.11
1D 910.87
2SR
2DR 915.15
15S 906.64
15D
16S 904.90
16D 904.58
910.06
908.96
3S
27D 908.58
27S 908.02
26D 915.04
26S 915.28
29D 902.16
29S 902.13
41S
28S 904.52
28D 901.83
10D 901.68
12D
35D 903.15
C-1
39D 905.22
2D 900.44
32S 900.58
31 897.86
30
37
925
920
915
910
905
900

WITH WELL

```
1                        U.S. GEOLOGICAL SURVEY MODULAR FINITE-DIFFERENCE GROUND-WATER MODEL
0BONMOD1 1 layer, 35 rows, 35 columns, 0 well                              unconfined, impermeable bedrock NEAR 33-D
    1 LAYERS            35 ROWS           35 COLUMNS
   1 STRESS PERIOD(S) IN SIMULATION
 MODEL TIME UNIT IS SECONDS
0I/O UNITS:
 ELEMENT OF IUNIT:  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
         I/O UNIT: 11 12  0  0  0  0  0  0 19  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0BAS1 -- BASIC MODEL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT  1
 ARRAYS RHS AND BUFF WILL SHARE MEMORY.
 START HEAD WILL BE SAVED
    11099 ELEMENTS IN X ARRAY ARE USED BY BAS
    11099 ELEMENTS OF X ARRAY USED OUT OF   30000
0BCF1 -- BLOCK-CENTERED FLOW PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 11
 STEADY-STATE SIMULATION
      LAYER  AQUIFER TYPE
      -------------------
         1          1
     2451 ELEMENTS IN X ARRAY ARE USED BY BCF
    13550 ELEMENTS OF X ARRAY USED OUT OF   30000
0WEL1 -- WELL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM 12
 MAXIMUM OF     1 WELLS
        4 ELEMENTS IN X ARRAY ARE USED FOR WELLS
    13554 ELEMENTS OF X ARRAY USED OUT OF   30000
0SIP1 -- STRONGLY IMPLICIT PROCEDURE SOLUTION PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 19
 MAXIMUM OF 100 ITERATIONS ALLOWED FOR CLOSURE
  5 ITERATION PARAMETERS
     5305 ELEMENTS IN X ARRAY ARE USED BY SIP
    18859 ELEMENTS OF X ARRAY USED OUT OF   30000
1BONMOD1 1 layer, 35 rows, 35 columns, 0 well                              unconfined, impermeable bedrock NEAR 33-D
0
```

BOUNDARY ARRAY FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35I2)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
0 1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1
0 2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 32	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 33	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 34	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 35	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					

1 1 1 1 -1
0AQUIFER HEAD WILL BE SET TO 999.90 AT ALL NO-FLOW NODES (IBOUND=0).
0

INITIAL HEAD FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35F5.0)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0 1	920.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 2	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 3	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	990.0	980.0
0 4	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 5	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 6	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 7	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 8	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 9	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 10	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 11	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 12	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 13	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 14	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 15	980.0	990.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 16	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 17	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 18	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	988.0
0 19	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	988.0	980.0
0 20	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 21	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 22	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	990.0	980.0
0 23	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	990.0	980.0
0 24	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 25	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	990.0	980.0	980.0	980.0	980.0	980.0	980.0
0 26	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	990.0	980.0	980.0	980.0	980.0	980.0	980.0
0 27	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 28	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 29	980.0	988.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	988.0	980.0	980.0	980.0	980.0	980.0
0 30	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 31	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 32	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0

	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
0 1	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	990.0	980.0	980.0	980.0	980.0	980.0	980.0
0 2	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	990.0	980.0	980.0	980.0
0 3	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	880.0	980.0
0 4	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 5	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 6	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 7	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 8	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	990.0	980.0	980.0
0 9	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 10	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 11	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 12	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 13	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 14	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 15	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 16	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 17	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 18	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 19	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 20	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 21	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 22	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	990.0	980.0	980.0	980.0	980.0	980.0
0 23	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 24	980.0	980.0	980.0	988.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 25	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 26	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 27	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 28	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 29	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 30	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 31	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 32	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0

	31	32	33	34	35
0 1	980.0	980.0	980.0	980.0	928.0
0 2	980.0	980.0	980.0	980.0	980.0
0 3	980.0	980.0	980.0	980.0	980.0
0 4	980.0	980.0	980.0	980.0	980.0
0 5	980.0	980.0	980.0	980.0	980.0
0 6	980.0	980.0	980.0	980.0	980.0
0 7	980.0	980.0	980.0	980.0	980.0
0 8	980.0	980.0	980.0	980.0	980.0
0 9	980.0	980.0	980.0	980.0	980.0
0 10	980.0	980.0	980.0	980.0	980.0
0 11	980.0	980.0	980.0	980.0	980.0
0 12	980.0	980.0	980.0	980.0	980.0
0 13	980.0	980.0	980.0	980.0	980.0
0 14	980.0	980.0	980.0	980.0	980.0
0 15	980.0	980.0	980.0	980.0	980.0
0 16	980.0	980.0	980.0	980.0	980.0
0 17	980.0	980.0	980.0	980.0	980.0
0 18	980.0	980.0	980.0	980.0	980.0
0 19	980.0	980.0	980.0	980.0	980.0
0 20	980.0	980.0	980.0	980.0	980.0
0 21	980.0	980.0	980.0	980.0	980.0
0 22	980.0	980.0	980.0	980.0	980.0
0 23	980.0	980.0	980.0	980.0	980.0
0 24	980.0	980.0	980.0	980.0	980.0
0 25	980.0	980.0	980.0	980.0	980.0
0 26	980.0	980.0	980.0	980.0	980.0
0 27	980.0	980.0	980.0	980.0	980.0
0 28	980.0	980.0	980.0	980.0	980.0
0 29	980.0	980.0	980.0	980.0	980.0
0 30	980.0	980.0	980.0	980.0	980.0
0 31	980.0	980.0	980.0	980.0	980.0
0 32	980.0	980.0	980.0	980.0	980.0

```
 0 33      980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0
           980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0
           980.0    980.0    980.0    980.0    980.0
 0 34      980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0
           980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0
           980.0    980.0    980.0    980.0    980.0
 0 35      905.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0
           980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0
           980.0    980.0    980.0    980.0    930.0
0DEFAULT OUTPUT CONTROL -- THE FOLLOWING OUTPUT COMES AT THE END OF EACH STRESS PERIOD:
 TOTAL VOLUMETRIC BUDGET
            HEAD
            DRAWDOWN
0                                               COLUMN TO ROW ANISOTROPY =    1.000000
0


                                                DELR WILL BE READ ON UNIT 11 USING FORMAT:            (35F6.3)
                                ------------------------------------------------------------------------------

    60.000         60.000         60.000         60.000         60.000         60.000         30.000         10.000         10.000         5.0000
    5.0000         5.0000         5.0000         3.0000         2.0000         2.0000         2.0000         2.0000         2.0000         2.0000
    2.0000         3.0000         5.0000         5.0000         5.0000         5.0000         10.000         10.000         30.000         60.000
    60.000         60.000         60.000         60.000         60.000
0


                                                DELC WILL BE READ ON UNIT 11 USING FORMAT:            (35F6.3)
                                ------------------------------------------------------------------------------

    60.000         60.000         60.000         60.000         60.000         60.000         30.000         10.000         10.000         5.0000
    5.0000         5.0000         5.0000         3.0000         2.0000         2.0000         2.0000         2.0000         2.0000         2.0000
    2.0000         3.0000         5.0000         5.0000         5.0000         5.0000         10.000         10.000         30.000         60.000
    60.000         60.000         60.000         60.000         60.000
0                                                     HYD. COND. ALONG ROWS =  0.4000000E-04 FOR LAYER  1 ——  4 x 10^-5 ft/s
0                                                                 BOTTOM =    895.0000      FOR LAYER  1
0


                                                      SOLUTION BY THE STRONGLY IMPLICIT PROCEDURE
                                                      -------------------------------------------
0                                               MAXIMUM ITERATIONS ALLOWED FOR CLOSURE =       100
                                                                ACCELERATION PARAMETER =     1.0000
                                                   HEAD CHANGE CRITERION FOR CLOSURE =     0.10000E-02
                                                   SIP HEAD CHANGE PRINTOUT INTERVAL =         1
0
    5 ITERATION PARAMETERS CALCULATED FROM SPECIFIED WSEED = 0.00100000 :

          0.0000000E+00  0.8221720E+00  0.9683772E+00  0.9943766E+00  0.9990000E+00
1                                                  STRESS PERIOD NO.    1, LENGTH =     10.00000
                                                   ----------------------------------------------

                                                   NUMBER OF TIME STEPS =      1

                                                   MULTIPLIER FOR DELT =      1.000

                                                 INITIAL TIME STEP SIZE =    10.00000
0           1 WELLS
                                               LAYER     ROW     COL     STRESS RATE    WELL NO.
                                               --------------------------------------------------
                                                 1       18      18    -0.35000E-02       1
0**********NODE    1    3  29 (LAYER,ROW,COL) WENT DRY AT ITERATION =  1  TIME STEP =  1  STRESS PERIOD =  1
0
    67 ITERATIONS FOR TIME STEP    1 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   -18.69      (  1,  2, 35)  -8.676      (  1,  2,  2)  -8.011      (  1,  3, 34)  -11.00      (  1,  2,  4)  -15.68      (  1, 32,  2)
   -5.367      (  1,  2, 29)  -1.767      (  1, 32, 32)  -2.383      (  1,  2,  3)  -4.652      (  1, 28, 10)  -15.40      (  1, 19, 14)
    2.353      (  1,  2,  1)  -1.072      (  1,  6,  6)  -1.583      (  1,  3, 34)  -3.320      (  1, 31, 31)  -7.673      (  1, 18, 18)
   -2.259      (  1,  2, 29)  0.6033      (  1,  2, 34) -0.9698      (  1,  2,  4)  -1.874      (  1, 29, 13)  -5.710      (  1, 18, 18)
    1.091      (  1,  2,  1)  0.5111      (  1,  2,  2) -0.5682      (  1, 34,  3)  -1.181      (  1,  7, 10)  -3.040      (  1, 18, 18)
  -0.7188      (  1,  2, 29)  0.2183      (  1,  2, 34) -0.3009      (  1,  1,  5) -0.6088      (  1, 29, 13)  -1.768      (  1, 18, 18)
   0.3425      (  1,  2,  1)  0.1746      (  1,  2,  2) -0.1681      (  1, 33,  3) -0.3463      (  1,  7, 12) -0.9150      (  1, 18, 18)
  -0.1872      (  1,  2, 29)  0.5743E-01 (  1,  2, 34) -0.7944E-01 (  1,  1,  8) -0.1602      (  1, 29, 13) -0.4568      (  1, 18, 18)
   0.8880E-01 (  1,  2,  1)  0.4685E-01 (  1,  2,  2) -0.4277E-01 (  1, 33,  3) -0.8814E-01 (  1,  7, 13) -0.2375      (  1, 18, 18)
  -0.4528E-01 (  1,  2, 29) -0.1373E-01 (  1, 30,  5) -0.1967E-01 (  1,  1,  8) -0.3978E-01 (  1, 30,  4) -0.1092      (  1, 18, 18)
   0.2165E-01 (  1,  2,  1)  0.1155E-01 (  1,  2,  2) -0.1033E-01 (  1, 34,  3) -0.2151E-01 (  1,  8, 12) -0.5854E-01 (  1, 18, 18)
  -0.1076E-01 (  1,  2, 29) -0.3402E-02 (  1, 30,  5) -0.4758E-02 (  1,  1,  9) -0.9675E-02 (  1, 30,  4) -0.2558E-01 (  1, 18, 18)
   0.5194E-02 (  1,  2,  1)  0.2781E-02 (  1,  2,  2) -0.2467E-02 (  1, 34,  3) -0.5181E-02 (  1,  8, 13) -0.1419E-01 (  1, 18, 18)
  -0.2548E-02 (  1,  2, 29) -0.8288E-03 (  1, 30,  5)
0
1                        HEAD IN LAYER  1 AT END OF TIME STEP  1 IN STRESS PERIOD  1
            --------------------------------------------------------------------------

              1             2             3             4             5             6             7             8             9            10
             11            12            13            14            15            16            17            18            19            20
             21            22            23            24            25            26            27            28            29            30
             31            32            33            34            35
 ..................................................................................................................................
 0  1      920.0         920.3         920.5         920.7         921.0         921.3         921.6         921.8         921.8         921.9
           921.9         922.0         922.0         922.0         922.0         922.1         922.1         922.1         922.1         922.1
           922.1         922.2         922.2         922.2         922.3         922.3         922.4         922.5         922.7         923.1
           923.7         924.4         925.2         926.3         928.0
 0  2      920.1         920.3         920.5         920.7         921.0         921.3         921.5         921.7         921.7         921.8
           921.8         921.9         921.9         921.9         921.9         922.0         922.0         922.0         922.0         922.0
           922.0         922.1         922.1         922.1         922.2         922.2         922.3         922.4         922.6         923.1
           923.6         924.2         924.9         925.7         926.4
 0  3      920.2         920.2         920.4         920.6         920.9         921.2         921.4         921.5         921.6         921.6
           921.6         921.7         921.7         921.7         921.7         921.7         921.8         921.8         921.8         921.8
           921.8         921.8         921.8         921.8         921.9         921.9         921.9         921.9      1.0000E+30       923.1
           923.5         924.0         924.5         925.0         925.4
 0  4      920.1         920.1         920.3         920.5         920.7         921.0         921.3         921.4         921.4         921.5
           921.5         921.5         921.6         921.6         921.6         921.6         921.7         921.7         921.7         921.7
           921.7         921.7         921.8         921.8         921.8         921.9         921.9         922.0         922.2         922.7
           923.2         923.7         924.1         924.5         924.7
 0  5      919.9         920.0         920.1         920.3         920.5         920.8         921.0         921.2         921.2         921.3
           921.3         921.3         921.4         921.4         921.4         921.4         921.5         921.5         921.5         921.5
```

	921.5	921.5	921.6	921.6	921.6	921.7	921.7	921.8	922.0	922.4
	922.9	923.4	923.8	924.1	924.3					
0 6	919.7	919.8	919.9	920.1	920.3	920.5	920.8	920.9	920.9	921.0
	921.0	921.0	921.1	921.1	921.1	921.1	921.1	921.2	921.2	921.2
	921.2	921.2	921.3	921.3	921.3	921.4	921.5	921.5	921.7	922.2
	922.7	923.2	923.6	923.8	924.0					
0 7	919.4	919.5	919.7	919.9	920.1	920.3	920.5	920.5	920.6	920.6
	920.6	920.7	920.7	920.7	920.7	920.8	920.8	920.8	920.8	920.8
	920.8	920.9	920.9	920.9	921.0	921.1	921.1	921.2	921.5	922.0
	922.6	923.1	923.5	923.8	923.9					
0 8	919.3	919.4	919.6	919.8	920.0	920.2	920.3	920.4	920.4	920.4
	920.4	920.4	920.5	920.5	920.5	920.5	920.5	920.6	920.6	920.6
	920.6	920.6	920.7	920.7	920.8	920.9	921.0	921.1	921.4	921.9
	922.6	923.1	923.5	923.7	923.9					
0 9	919.3	919.4	919.5	919.7	920.0	920.2	920.3	920.3	920.3	920.3
	920.3	920.3	920.3	920.3	920.3	920.4	920.4	920.4	920.4	920.4
	920.4	920.5	920.5	920.6	920.7	920.7	920.9	921.0	921.3	921.9
	922.5	923.1	923.4	923.7	923.9					
0 10	919.2	919.3	919.5	919.7	919.9	920.2	920.2	920.2	920.2	920.2
	920.2	920.2	920.2	920.2	920.2	920.3	920.2	920.2	920.3	920.3
	920.3	920.3	920.4	920.5	920.6	920.7	920.8	921.0	921.3	921.9
	922.5	923.0	923.4	923.7	923.9					
0 11	919.2	919.3	919.4	919.7	919.9	920.1	920.2	920.2	920.2	920.1
	920.1	920.1	920.1	920.1	920.1	920.1	920.1	920.1	920.1	920.2
	920.2	920.2	920.3	920.4	920.5	920.6	920.7	920.9	921.3	921.9
	922.5	923.0	923.4	923.7	923.9					
0 12	919.2	919.3	919.4	919.6	919.9	920.1	920.2	920.2	920.1	920.1
	920.0	920.0	920.0	920.0	919.9	919.9	920.0	920.0	920.0	920.0
	920.1	920.1	920.2	920.3	920.4	920.5	920.7	920.9	921.3	921.9
	922.5	923.0	923.4	923.7	923.9					
0 13	919.1	919.2	919.4	919.6	919.9	920.1	920.2	920.1	920.1	920.0
	920.0	919.9	919.9	919.8	919.8	919.8	919.8	919.8	919.8	919.8
	919.9	920.0	920.1	920.2	920.4	920.5	920.7	920.9	921.2	921.9
	922.5	923.0	923.4	923.7	923.9					
0 14	919.1	919.2	919.4	919.6	919.9	920.1	920.1	920.1	920.1	920.0
	919.9	919.9	919.8	919.7	919.6	919.6	919.5	919.5	919.6	919.6
	919.7	919.8	920.0	920.2	920.3	920.5	920.6	920.9	921.2	921.9
	922.5	923.0	923.4	923.7	923.9					
0 15	919.1	919.2	919.4	919.6	919.8	920.1	920.1	920.1	920.0	920.0
	919.9	919.8	919.7	919.6	919.5	919.4	919.3	919.3	919.4	919.5
	919.6	919.7	919.9	920.1	920.3	920.4	920.6	920.9	921.2	921.9
	922.5	923.0	923.4	923.7	923.9					
0 16	919.1	919.2	919.3	919.6	919.8	920.1	920.1	920.1	920.0	920.0
	919.9	919.8	919.7	919.5	919.4	919.3	919.1	919.1	919.2	919.3
	919.5	919.7	919.9	920.1	920.3	920.4	920.6	920.8	921.2	921.9
	922.5	923.0	923.4	923.7	923.9					
0 17	919.1	919.2	919.3	919.6	919.8	920.1	920.1	920.1	920.0	920.0
	919.9	919.8	919.6	919.5	919.3	919.1	918.9	918.7	918.9	919.2
	919.4	919.6	919.9	920.1	920.3	920.4	920.6	920.8	921.2	921.9
	922.5	923.0	923.4	923.7	923.9					
0 18	919.0	919.1	919.3	919.6	919.8	920.0	920.1	920.1	920.0	919.9
	919.9	919.8	919.6	919.4	919.3	919.0	918.6	917.7	918.7	919.1
	919.4	919.6	919.9	920.1	920.3	920.4	920.6	920.8	921.2	921.9
	922.5	923.0	923.4	923.7	923.9					
0 19	919.0	919.1	919.3	919.5	919.8	920.0	920.1	920.1	920.0	919.9
	919.9	919.8	919.6	919.5	919.3	919.1	918.9	918.7	918.9	919.2
	919.4	919.6	919.9	920.1	920.3	920.4	920.6	920.8	921.2	921.9
	922.5	923.0	923.4	923.7	923.9					
0 20	919.0	919.1	919.3	919.5	919.8	920.0	920.1	920.1	920.0	919.9
	919.9	919.8	919.7	919.5	919.4	919.2	919.1	919.1	919.2	919.3
	919.5	919.6	919.9	920.1	920.3	920.4	920.6	920.8	921.2	921.9
	922.5	923.0	923.4	923.7	923.9					
0 21	919.0	919.1	919.3	919.5	919.8	920.0	920.1	920.1	920.0	919.9
	919.9	919.8	919.7	919.6	919.5	919.4	919.3	919.3	919.4	919.5
	919.6	919.7	919.9	920.1	920.3	920.4	920.6	920.8	921.2	921.9
	922.5	923.0	923.4	923.7	923.9					
0 22	919.0	919.1	919.3	919.5	919.8	920.0	920.1	920.1	920.0	920.0
	919.9	919.8	919.7	919.6	919.6	919.5	919.5	919.5	919.5	919.6
	919.7	919.8	919.9	920.1	920.3	920.4	920.6	920.8	921.2	921.9
	922.5	923.0	923.5	923.7	923.9					
0 23	918.9	919.1	919.2	919.5	919.8	920.0	920.1	920.1	920.0	920.0
	919.9	919.9	919.8	919.8	919.7	919.7	919.7	919.7	919.7	919.8
	919.8	919.9	920.0	920.2	920.3	920.5	920.6	920.8	921.2	921.9
	922.5	923.0	923.5	923.7	923.9					
0 24	918.9	919.0	919.2	919.5	919.7	920.0	920.1	920.1	920.0	920.0
	920.0	919.9	919.9	919.9	919.9	919.9	919.9	919.9	919.9	919.9
	920.0	920.0	920.1	920.2	920.4	920.5	920.7	920.9	921.2	921.9
	922.5	923.0	923.5	923.7	923.9					
0 25	918.9	919.0	919.2	919.4	919.7	920.0	920.1	920.1	920.1	920.0
	920.0	920.0	920.0	920.0	920.0	920.0	920.0	920.0	920.0	920.1
	920.1	920.1	920.2	920.3	920.4	920.5	920.7	920.9	921.2	921.9
	922.5	923.0	923.5	923.8	923.9					
0 26	918.8	918.9	919.1	919.4	919.7	920.0	920.1	920.1	920.1	920.1
	920.1	920.1	920.1	920.1	920.1	920.1	920.1	920.1	920.2	920.2
	920.2	920.2	920.3	920.4	920.5	920.6	920.7	920.9	921.2	921.9
	922.5	923.1	923.5	923.8	923.9					
0 27	918.8	918.9	919.1	919.4	919.7	920.0	920.1	920.1	920.1	920.1
	920.1	920.2	920.2	920.2	920.2	920.2	920.2	920.3	920.3	920.3
	920.3	920.3	920.4	920.5	920.6	920.6	920.8	920.9	921.2	921.9
	922.5	923.1	923.5	923.8	923.9					
0 28	918.7	918.8	919.0	919.3	919.6	919.9	920.1	920.2	920.2	920.2
	920.2	920.3	920.3	920.3	920.3	920.3	920.4	920.4	920.4	920.4
	920.4	920.5	920.5	920.6	920.6	920.7	920.8	921.0	921.3	921.9
	922.5	923.1	923.5	923.8	924.0					
0 29	918.5	918.6	918.9	919.2	919.6	919.9	920.1	920.2	920.3	920.3
	920.4	920.4	920.4	920.5	920.5	920.5	920.5	920.5	920.6	920.6
	920.6	920.6	920.7	920.7	920.8	920.8	920.9	921.1	921.3	921.9
	922.6	923.1	923.5	923.9	924.0					
0 30	918.1	918.2	918.5	918.9	919.4	919.8	920.2	920.3	920.4	920.5
	920.5	920.6	920.6	920.7	920.7	920.7	920.7	920.8	920.8	920.8
	920.8	920.8	920.9	920.9	921.0	921.0	921.1	921.2	921.5	922.0
	922.6	923.2	923.7	924.0	924.2					
0 31	917.3	917.5	918.0	918.5	919.1	919.7	920.2	920.4	920.5	920.6
	920.6	920.7	920.7	920.8	920.8	920.8	920.9	920.9	920.9	920.9
	921.0	921.0	921.0	921.1	921.1	921.2	921.3	921.4	921.6	922.2
	922.8	923.5	924.0	924.4	924.6					
0 32	916.2	916.6	917.3	918.0	918.8	919.6	920.1	920.4	920.5	920.6
	920.7	920.7	920.8	920.8	920.9	920.9	920.9	920.9	921.0	921.0

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        921.0      921.0      921.1      921.2      921.2      921.3      921.4      921.5      921.8      922.3
        923.1      923.8      924.4      925.0      925.3
 0 33   914.5      915.4      916.4      917.5      918.5      919.4      920.1      920.3      920.5      920.6
        920.7      920.7      920.8      920.9      920.9      920.9      920.9      921.0      921.0      921.0
        921.1      921.1      921.1      921.2      921.3      921.4      921.5      921.6      921.9      922.5
        923.3      924.1      925.0      925.7      926.2
 0 34   911.8      913.7      915.5      917.0      918.2      919.3      920.0      920.3      920.5      920.6
        920.6      920.7      920.8      920.9      920.9      920.9      921.0      921.0      921.0      921.0
        921.1      921.1      921.2      921.2      921.3      921.4      921.5      921.7      921.9      922.6
        923.5      924.5      925.5      926.6      927.7
 0 35   905.0      911.9      914.8      916.7      918.0      919.2      920.0      920.3      920.4      920.6
        920.6      920.7      920.8      920.9      920.9      920.9      921.0      921.0      921.0      921.1
        921.1      921.1      921.2      921.3      921.3      921.4      921.5      921.7      922.0      922.7
        923.6      924.7      926.0      927.6      930.0
1                   DRAWDOWN IN LAYER  1 AT END OF TIME STEP  1 IN STRESS PERIOD  1
                    ---------------------------------------------------------------

            1          2          3          4          5          6          7          8          9         10
           11         12         13         14         15         16         17         18         19         20
           21         22         23         24         25         26         27         28         29         30
           31         32         33         34         35
.............................................................................................................
 0  1   0.0000E+00 59.75      59.52      59.27      58.99      58.67      58.38      58.24      58.17      58.12
        58.08      58.04      58.00      57.97      57.95      57.94      57.92      57.91      57.89      57.87
        57.86      57.84      57.80      67.76      57.72      57.68      57.61      57.52      57.33      56.90
        56.29      55.61      54.79      53.69      0.0000E+00
 0  2   59.86      59.72      59.54      59.31      59.04      58.73      58.45      58.32      58.26      58.21
        58.17      58.14      58.10      58.07      58.05      58.04      58.02      58.01      57.99      57.98
        57.96      57.94      57.91      57.87      57.82      57.78      67.71      57.61      57.40      56.94
        56.38      55.78      55.10      54.34      53.64
 0  3   59.85      59.76      59.60      59.39      59.14      58.84      58.59      58.48      58.42      58.38
        58.35      58.33      58.30      68.28      58.27      58.26      58.25      58.24      58.23      58.22
        58.21      58.20      58.18      58.16      58.14      58.13      58.10      58.09      1.0000E+30 56.93
        56.54      56.03      55.50      54.99      54.63
 0  4   59.93      59.85      59.71      59.52      59.28      58.99      58.74      58.62      58.56      58.51
        58.48      58.45      58.42      58.39      58.37      58.36      58.35      58.33      58.32      58.31
        58.29      58.27      58.25      58.21      58.17      58.13      58.07      57.99      57.80      57.32
        56.81      56.33      55.88      55.51      55.28
 0  5   60.09      60.02      59.89      59.70      59.47      59.19      58.95      58.83      58.77      58.72
        58.69      58.65      58.62      58.59      58.57      58.56      58.54      58.53      58.51      58.50
        58.48      58.47      58.44      58.40      58.36      58.32      58.26      58.17      58.00      57.59
        57.07      56.60      56.20      55.90      55.73
 0  6   60.32      60.25      60.11      59.93      59.70      59.45      59.24      59.13      59.07      59.03
        59.00      58.96      58.93      58.90      58.88      58.87      58.85      58.84      58.82      58.81
        58.79      58.77      58.74      58.70      58.66      58.61      58.55      58.46      58.27      57.83
        57.29      56.81      56.43      56.15      56.01
 0  7   60.55      60.47      60.32      60.13      59.90      59.67      59.52      59.45      59.41      59.38
        59.36      59.33      59.30      59.27      59.26      59.24      59.23      59.21      59.19      59.18
        59.16      59.14      59.10      59.05      59.00      58.95      58.87      58.75      58.52      58.00
        57.40      56.91      56.52      56.25      56.11
 0  8   60.67      60.58      60.43      60.22      59.99      59.77      59.66      59.62      59.61      59.59
        59.58      59.56      59.54      59.52      59.50      59.49      59.47      59.46      59.44      59.42
        59.40      59.38      59.34      59.28      59.21      59.15      59.04      68.90      58.63      58.06
        57.44      56.94      56.54      56.27      56.13
 0  9   60.73      60.64      60.48      60.27      60.03      59.81      59.72      59.71      59.71      59.70
        59.70      59.69      59.68      59.67      59.65      59.64      59.63      59.61      59.60      59.58
        59.55      59.53      59.48      59.41      59.33      59.26      59.14      58.98      58.68      58.09
        57.46      56.95      56.55      56.28      56.13
 0 10   60.77      60.69      60.52      60.31      60.07      59.85      59.76      59.77      59.78      59.80
        59.81      59.81      59.81      59.81      59.80      59.79      59.78      59.76      59.74      59.72
        59.70      59.67      59.61      59.52      59.43      59.34      59.21      59.03      58.71      58.10
        57.47      56.95      56.56      56.28      56.14
 0 11   60.81      60.72      60.55      60.33      60.09      59.87      59.79      59.81      59.83      59.86
        59.88      59.90      59.91      59.92      59.91      59.91      59.90      59.88      59.86      59.84
        59.81      59.77      59.70      59.60      59.50      59.40      59.25      59.07      58.73      58.11
        57.47      56.96      56.56      56.28      56.14
 0 12   60.84      60.75      60.58      60.36      60.11      59.89      59.82      59.85      59.88      59.92
        59.95      59.99      60.02      60.04      60.05      60.05      60.05      60.03      60.01      59.98
        59.95      59.90      59.81      59.69      59.57      59.46      59.29      59.10      58.75      58.12
        57.48      56.96      56.56      56.28      56.14
 0 13   60.87      60.78      60.61      60.38      60.13      59.91      59.84      59.88      59.92      59.97
        60.02      60.08      60.14      60.20      60.22      60.24      60.24      60.23      60.21      60.17
        60.12      60.05      59.93      59.78      59.64      59.51      59.33      59.12      58.76      58.13
        57.48      56.96      56.56      56.28      56.14
 0 14   60.90      60.81      60.63      60.40      60.15      59.92      59.85      59.90      59.94      60.01
        60.07      60.14      60.24      60.34      60.40      60.44      60.46      60.46      60.43      60.37
        60.29      60.19      60.02      59.84      59.68      59.54      59.35      59.14      58.77      58.13
        57.48      56.96      56.56      56.28      56.13
 0 15   60.92      70.82      60.65      60.41      60.16      59.93      59.86      59.91      59.96      60.03
        60.09      60.17      60.29      60.42      60.52      60.59      60.66      60.68      60.62      60.52
        60.41      60.27      60.07      59.87      59.70      59.56      59.36      59.15      58.78      58.14
        57.48      56.96      56.56      56.28      56.13
 0 16   60.93      60.84      60.66      60.42      60.17      59.94      59.87      59.92      59.97      60.04
        60.10      60.20      60.33      60.49      60.62      60.73      60.85      60.92      60.82      60.66
        60.51      60.34      60.11      59.89      59.72      59.57      59.37      59.15      58.78      58.14
        57.48      56.96      56.56      56.27      56.13
 0 17   60.95      60.85      60.67      60.43      60.18      59.95      59.88      59.92      59.97      60.05
        60.12      60.21      60.35      60.53      60.70      60.88      61.11      61.34      61.07      60.80
        60.59      60.38      60.13      59.91      59.73      59.57      59.38      59.16      58.79      58.14
        57.49      56.96      56.55      56.27      56.13
 0 18   60.96      60.86      60.68      60.44      60.18      59.95      59.88      59.93      59.98      60.05
        60.12      60.22      60.36      60.56      68.74      60.96      61.36      62.29      61.33      60.89
        60.63      60.41      60.15      59.91      59.73      59.58      59.38      59.16      58.79      58.14
        57.49      56.96      56.55      56.27      56.13
 0 19   60.97      60.88      60.69      60.45      60.19      59.96      59.89      59.93      59.98      60.06
        60.12      60.22      60.36      68.54      60.71      60.88      61.12      61.35      61.08      60.81
        60.60      60.39      60.14      59.91      59.73      59.58      59.38      59.17      58.79      58.14
        57.49      56.96      56.55      56.27      56.13
 0 20   60.99      60.89      60.71      60.47      60.20      59.97      59.89      59.94      59.99      60.06
        60.12      60.21      60.34      60.50      60.63      60.75      60.87      60.94      60.83      60.68
        60.53      60.35      60.12      59.91      59.73      59.58      59.38      59.17      58.79      58.15
        57.49      56.96      56.55      56.27      56.12
 0 21   61.00      60.90      60.72      60.48      60.21      59.97      59.90      59.94      59.99      60.05
        60.12      60.20      60.32      60.45      60.54      60.62      60.68      60.70      60.64      60.55
        60.44      60.30      60.10      59.89      59.72      59.58      59.38      59.17      58.79      58.15
        57.49      56.96      56.55      56.27      56.12
 0 22   61.02      60.92      60.73      60.49      60.22      59.98      59.90      59.94      59.98      60.05
        60.10      60.18      60.27      70.37      60.43      60.47      60.50      60.50      60.46      60.40
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        60.32      60.22      60.05      59.87      69.71      59.57      59.38      59.17      58.80      58.15
        57.49      56.96      56.55      56.26      56.12
 0 23   61.05      60.95      60.76      60.51      60.24      59.99      59.91      59.94      59.98      60.03
        60.07      60.13      60.19      70.25      60.27      60.29      60.29      60.28      60.25      60.22
        60.17      60.10      59.97      59.82      59.68      59.55      59.37      59.16      58.79      58.15
        57.49      56.96      56.55      56.26      56.11
 0 24   61.09      60.98      60.79      60.54      60.26      60.00      59.91      59.93      59.96      60.00
        60.03      60.06      60.10      60.12      60.12      60.12      60.11      60.10      68.08      60.05
        60.02      59.97      59.87      59.75      59.63      59.51      59.35      59.15      58.79      58.15
        57.49      56.95      56.54      56.25      56.11
 0 25   61.13      61.02      60.82      60.56      60.28      60.02      59.91      59.92      69.94      59.96
        59.98      59.99      60.01      60.01      60.00      60.00      59.99      59.97      59.95      59.93
        59.90      59.86      59.78      59.68      59.58      59.47      59.32      59.13      58.79      58.15
        57.49      56.95      56.53      56.25      56.10
 0 26   61.17      61.06      60.85      60.59      60.30      60.03      59.91      59.91      69.91      59.92
        59.93      69.93      59.93      59.92      59.91      59.90      59.89      59.87      59.85      59.83
        69.80      59.77      59.71      59.62      59.53      59.43      59.29      59.11      58.78      58.15
        57.48      56.95      56.53      56.24      56.09
 0 27   61.23      61.11      60.90      60.63      60.33      60.05      59.91      59.88      59.87      59.86
        59.85      59.84      59.83      59.81      59.79      59.78      59.76      59.75      59.73      59.71
        59.68      59.65      59.60      59.53      59.45      59.37      59.24      59.08      58.76      58.14
        57.48      56.94      56.52      56.22      56.07
 0 28   61.31      61.19      60.97      60.68      60.37      60.07      59.90      59.84      59.81      59.79
        59.77      59.75      59.72      59.70      59.68      59.66      59.65      59.63      59.61      59.59
        59.57      59.54      59.50      59.43      59.36      59.29      59.18      59.03      58.73      58.13
        57.47      56.92      56.50      56.20      56.05
 0 29   61.49      69.36      61.11      60.80      60.45      60.10      59.87      59.77      59.71      67.67
        59.64      59.60      59.56      59.53      59.51      59.49      59.47      59.46      59.44      59.42
        59.40      59.37      59.33      59.27      59.22      59.15      59.06      58.93      58.67      58.10
        57.44      56.89      56.46      56.15      55.99
 0 30   61.94      61.77      61.46      61.07      60.63      60.17      59.82      59.65      59.57      59.50
        59.46      59.41      59.36      59.33      59.30      59.28      59.26      59.24      59.22      59.20
        59.18      59.15      59.11      59.06      59.01      58.95      58.87      58.76      58.53      58.00
        57.35      56.78      56.31      55.97      55.79
 0 31   62.74      62.48      62.03      61.48      60.89      60.29      59.82      59.61      59.50      59.42
        59.37      59.31      59.26      59.21      59.18      59.16      59.14      59.12      59.09      59.07
        59.05      59.02      58.98      58.92      58.86      58.80      58.72      58.60      58.37      57.84
        57.16      56.54      56.00      55.59      55.36
 0 32   63.84      63.41      62.73      61.96      61.19      60.43      59.87      59.62      59.49      59.40
        59.34      59.28      59.21      59.16      59.13      59.11      59.08      59.06      59.03      59.01
        58.98      58.95      58.90      58.84      58.78      58.71      58.62      58.49      58.24      57.68
        56.93      56.22      55.57      55.03      54.71
 0 33   65.48      64.65      63.56      62.49      61.50      60.59      59.94      59.65      59.51      59.41
        59.34      59.27      59.20      59.15      59.11      59.08      59.06      59.03      59.00      58.97
        58.95      58.91      58.86      58.79      58.72      58.65      58.55      58.41      58.13      57.52
        56.69      55.86      55.04      54.29      53.76
 0 34   68.25      66.29      64.47      63.00      61.78      60.73      60.00      59.69      59.54      59.43
        59.35      59.28      59.20      59.14      59.10      59.07      59.04      59.01      58.98      58.95
        58.93      58.89      58.83      58.75      58.68      58.61      58.50      58.35      58.05      57.39
        56.48      55.52      54.48      53.37      52.33
 0 35  0.0000E+00  68.14      65.21      63.34      61.96      60.81      60.05      59.72      59.56      59.44
        59.36      59.28      59.20      59.14      59.10      59.07      59.04      59.01      58.98      58.95
        58.92      58.88      58.82      58.74      58.66      58.58      58.47      58.32      58.01      57.32
        56.35      55.29      54.04      52.42     0.0000E+00
0

                      VOLUMETRIC BUDGET FOR ENTIRE MODEL AT END OF TIME STEP  1 IN STRESS PERIOD  1
                      ------------------------------------------------------------------------------
0               CUMULATIVE VOLUMES      L**3                              RATES FOR THIS TIME STEP      L**3/T
                ------------------                                        ------------------------

                      IN:                                                       IN:
                      ---                                                       ---
                          STORAGE =   0.00000E+00                                   STORAGE =   0.00000E+00
                    CONSTANT HEAD =   0.10693                                 CONSTANT HEAD =   0.10693E-01
                            WELLS =   0.00000E+00                                     WELLS =   0.00000E+00
0                        TOTAL IN =   0.10693                                      TOTAL IN =   0.10693E-01
0                    OUT:                                                      OUT:
                     ----                                                      ----
                          STORAGE =   0.00000E+00                                   STORAGE =   0.00000E+00
                    CONSTANT HEAD =   0.72281E-01                             CONSTANT HEAD =   0.72281E-02
                            WELLS =   0.35000E-01                                     WELLS =   0.35000E-02
0                       TOTAL OUT =   0.10728                                     TOTAL OUT =   0.10728E-01
0                        IN - OUT =  -0.34837E-03                                  IN - OUT =  -0.34837E-04
0            PERCENT DISCREPANCY =               -0.33           PERCENT DISCREPANCY =                -0.33


0

         TIME SUMMARY AT END OF TIME STEP  1 IN STRESS PERIOD  1
                                SECONDS      MINUTES       HOURS          DAYS          YEARS
                          -----------------------------------------------------------------------
     TIME STEP LENGTH           10.0000      0.166667    0.277778E-02   0.115741E-03   0.316881E-06
   STRESS PERIOD TIME           10.0000      0.166667    0.277778E-02   0.115741E-03   0.316881E-06
 TOTAL SIMULATION TIME          10.0000      0.166667    0.277778E-02   0.115741E-03   0.316881E-06
1
```

WITHOUT WELL

```
1                         U.S. GEOLOGICAL SURVEY MODULAR FINITE-DIFFERENCE GROUND-WATER MODEL
0BONMOD1 1 layer, 35 rows, 35 columns, 0 well                                        unconfined, impermeable bedrock NEAR 33-D
    1 LAYERS          35 ROWS          35 COLUMNS
   1 STRESS PERIOD(S) IN SIMULATION
 MODEL TIME UNIT IS SECONDS
0I/O UNITS:
 ELEMENT OF IUNIT:  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
         I/O UNIT: 11  0  0  0  0  0  0  0 19  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0BAS1 -- BASIC MODEL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT  1
 ARRAYS RHS AND BUFF WILL SHARE MEMORY.
 START HEAD WILL BE SAVED
     11099 ELEMENTS IN X ARRAY ARE USED BY BAS
     11099 ELEMENTS OF X ARRAY USED OUT OF   30000
0BCF1 -- BLOCK-CENTERED FLOW PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 11
 STEADY-STATE SIMULATION
      LAYER  AQUIFER TYPE
      ------------------
         1          1
      2451 ELEMENTS IN X ARRAY ARE USED BY BCF
     13550 ELEMENTS OF X ARRAY USED OUT OF   30000
0SIP1 -- STRONGLY IMPLICIT PROCEDURE SOLUTION PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 19
 MAXIMUM OF 100 ITERATIONS ALLOWED FOR CLOSURE
  5 ITERATION PARAMETERS
      5305 ELEMENTS IN X ARRAY ARE USED BY SIP
     18855 ELEMENTS OF X ARRAY USED OUT OF   30000
1BONMOD1 1 layer, 35 rows, 35 columns, 0 well                                        unconfined, impermeable bedrock NEAR 33-D
0
```

BOUNDARY ARRAY FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35I2)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
0 1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1
0 2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 32	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 33	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 34	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 35	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1

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0AQUIFER HEAD WILL BE SET TO  999.90      AT ALL NO-FLOW NODES (IBOUND=0).
0
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INITIAL HEAD FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35F5.0)

	1 16 31	2 17 32	3 18 33	4 19 34	5 20 35	6 21	7 22	8 23	9 24	10 25	11 26	12 27	13 28	14 29	15 30
0 1	920.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	990.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	928.0										
0 2	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	990.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 3	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	990.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	880.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 4	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 5	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 6	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 7	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 8	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	990.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 9	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 10	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 11	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 12	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 13	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 14	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 15	980.0	990.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 16	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 17	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 18	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	988.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 19	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	988.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 20	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 21	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 22	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	990.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	990.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 23	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	990.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 24	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	988.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 25	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	990.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 26	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	990.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 27	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 28	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 29	980.0	988.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	988.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 30	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 31	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 32	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 33	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 34	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0

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         980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0
         980.0   980.0   980.0   980.0   980.0
 0 35    905.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0
         980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0
         980.0   980.0   980.0   980.0   930.0
0DEFAULT OUTPUT CONTROL -- THE FOLLOWING OUTPUT COMES AT THE END OF EACH STRESS PERIOD:
 TOTAL VOLUMETRIC BUDGET
          HEAD
          DRAWDOWN
0                                            COLUMN TO ROW ANISOTROPY =   1.000000
0


                                                 DELR WILL BE READ ON UNIT 11 USING FORMAT:           (35F6.3)
                              ------------------------------------------------------------------------------------

   60.000      60.000      60.000      60.000      60.000      60.000      30.000      10.000      10.000      5.0000
   5.0000      5.0000      5.0000      3.0000      2.0000      2.0000      2.0000      2.0000      2.0000      2.0000
   2.0000      3.0000      5.0000      5.0000      5.0000      5.0000      10.000      10.000      30.000      60.000
   60.000      60.000      60.000      60.000      60.000
0


                                                 DELC WILL BE READ ON UNIT 11 USING FORMAT:           (35F6.3)
                              ------------------------------------------------------------------------------------

   60.000      60.000      60.000      60.000      60.000      60.000      30.000      10.000      10.000      5.0000
   5.0000      5.0000      5.0000      3.0000      2.0000      2.0000      2.0000      2.0000      2.0000      2.0000
   2.0000      3.0000      5.0000      5.0000      5.0000      5.0000      10.000      10.000      30.000      60.000
   60.000      60.000      60.000      60.000      60.000
0                                                   HYD. COND. ALONG ROWS =  0.4000000E-04 FOR LAYER  1
0                                                                  BOTTOM =   895.0000      FOR LAYER  1
0


                                                        SOLUTION BY THE STRONGLY IMPLICIT PROCEDURE
                                                        -------------------------------------------
0                                             MAXIMUM ITERATIONS ALLOWED FOR CLOSURE =       100
                                                             ACCELERATION PARAMETER =      1.0000
                                                  HEAD CHANGE CRITERION FOR CLOSURE =    0.10000E-02
                                                  SIP HEAD CHANGE PRINTOUT INTERVAL =         1
0
    5 ITERATION PARAMETERS CALCULATED FROM SPECIFIED WSEED = 0.00100000 :

          0.0000000E+00  0.8221720E+00  0.9683772E+00  0.9943766E+00  0.9990000E+00
1                                               STRESS PERIOD NO.    1, LENGTH =    10.00000
                                                ----------------------------------------------

                                                NUMBER OF TIME STEPS =      1

                                                 MULTIPLIER FOR DELT =     1.000

                                               INITIAL TIME STEP SIZE =    10.00000
0**********NODE    1    3  29 (LAYER,ROW,COL) WENT DRY AT ITERATION =  1  TIME STEP =  1  STRESS PERIOD =  1
0
    67 ITERATIONS FOR TIME STEP    1 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   -18.69      (  1,  2, 35)  -8.676      (  1,  2,  2)  -8.010      (  1,  3, 34)  -10.99      (  1,  2,  4)  -15.58      (  1, 32,  2)
   -5.294      (  1,  2, 29)  -1.766      (  1, 32, 32)  -2.355      (  1,  2,  3)  -4.573      (  1, 28, 11)  -15.16      (  1, 18, 14)
    2.291      (  1,  2,  1)  -1.062      (  1,  6,  6)  -1.560      (  1,  3, 34)  -3.274      (  1, 31, 31)  -7.253      (  1, 16, 18)
   -2.202      (  1,  2, 29)  0.5913      (  1,  2, 34) -0.9478      (  1,  2,  4)  -1.803      (  1, 28, 13)  -5.380      (  1, 18, 17)
    1.046      (  1,  2,  1)  0.4883      (  1,  2,  2) -0.5519      (  1, 34,  3)  -1.121      (  1,  7,  6)  -2.747      (  1, 18, 16)
  -0.6921      (  1,  2, 29)  0.2097      (  1,  2, 34) -0.2923      (  1,  2,  4) -0.5681      (  1, 29, 12)  -1.585      (  1, 18, 17)
   0.3236      (  1,  2,  1)  0.1633      (  1,  2,  2) -0.1612      (  1, 34,  3) -0.3188      (  1,  7, 11) -0.7942      (  1, 18, 16)
  -0.1789      (  1,  2, 29)  0.5476E-01 (  1,  2, 34) -0.7517E-01 (  1,  1,  8) -0.1483      (  1, 30,  4) -0.3966      (  1, 18, 17)
   0.8295E-01  (  1,  2,  1)  0.4319E-01 (  1,  2,  2) -0.4056E-01 (  1, 34,  3) -0.7981E-01 (  1,  7, 12) -0.2020      (  1, 19, 17)
  -0.4298E-01  (  1,  2, 29)  0.1287E-01 (  1,  2, 34) -0.1844E-01 (  1,  1,  8) -0.3653E-01 (  1, 30,  4) -0.9304E-01 (  1, 18, 17)
   0.2002E-01  (  1,  2,  1)  0.1053E-01 (  1,  2,  2) -0.9699E-02 (  1, 34,  3) -0.1917E-01 (  1,  8, 11) -0.4925E-01 (  1, 19, 17)
  -0.1013E-01  (  1,  2, 29)  0.2959E-02 (  1,  2, 34) -0.4418E-02 (  1,  1,  8) -0.8814E-02 (  1, 30,  4) -0.2148E-01 (  1, 18, 17)
   0.4754E-02  (  1,  2,  1)  0.2513E-02 (  1,  2,  2) -0.2289E-02 (  1, 34,  3) -0.4572E-02 (  1,  8, 12) -0.1184E-01 (  1, 19, 17)
  -0.2376E-02  (  1,  2, 29) -0.7143E-03 (  1, 30,  5)
0
1                          HEAD IN LAYER  1 AT END OF TIME STEP  1 IN STRESS PERIOD  1
           -------------------------------------------------------------------------

            1           2           3           4           5           6           7           8           9          10
           11          12          13          14          15          16          17          18          19          20
           21          22          23          24          25          26          27          28          29          30
           31          32          33          34          35
 ..............................................................................................................................
 0  1     920.0       920.7       921.2       921.6       922.0       922.4       922.7       922.8       922.9       922.9
          923.0       923.0       923.0       923.1       923.1       923.1       923.1       923.1       923.2       923.2
          923.2       923.2       923.2       923.3       923.3       923.4       923.4       923.5       923.7       924.0
          924.6       925.1       925.8       926.7       928.0
 0  2     920.6       920.9       921.2       921.6       922.0       922.3       922.6       922.8       922.8       922.9
          922.9       923.0       923.0       923.0       923.0       923.0       923.1       923.1       923.1       923.1
          923.1       923.1       923.2       923.2       923.2       923.3       923.3       923.4       923.6       924.0
          924.5       925.0       925.6       926.2       926.7
 0  3     920.9       921.0       921.3       921.6       921.9       922.3       922.6       922.7       922.7       922.8
          922.8       922.8       922.9       922.9       922.9       922.9       922.9       922.9       922.9       923.0
          923.0       923.0       923.0       923.0       923.0       923.0       923.1       923.1   1.0000E+30      924.1
          924.4       924.8       925.3       925.7       925.9
 0  4     920.9       921.1       921.3       921.6       921.9       922.2       922.5       922.7       922.7       922.8
          922.8       922.8       922.9       922.9       922.9       922.9       922.9       922.9       923.0       923.0
          923.0       923.0       923.0       923.1       923.1       923.1       923.2       923.3       923.4       923.8
          924.3       924.6       925.0       925.3       925.5
 0  5     920.9       921.0       921.2       921.5       921.8       922.2       922.5       922.6       922.7       922.7
          922.7       922.8       922.8       922.8       922.9       922.9       922.9       922.9       922.9       922.9
          922.9       923.0       923.0       923.0       923.1       923.1       923.1       923.2       923.4       923.7
          924.1       924.5       924.8       925.0       925.1
 0  6     920.8       920.9       921.1       921.4       921.7       922.1       922.4       922.5       922.6       922.6
          922.7       922.7       922.7       922.8       922.8       922.8       922.8       922.8       922.8       922.8
          922.9       922.9       922.9       922.9       923.0       923.0       923.1       923.1       923.3       923.6
          924.0       924.3       924.6       924.8       924.9
 0  7     920.6       920.7       920.9       921.2       921.6       922.0       922.3       922.4       922.5       922.5
          922.6       922.6       922.7       922.7       922.7       922.7       922.7       922.7       922.8       922.8
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	922.8	922.8	922.8	922.9	922.9	922.9	923.0	923.1	923.2	923.5
	923.9	924.3	924.6	924.8	924.9					
0 8	920.5	920.6	920.8	921.1	921.5	921.9	922.2	922.4	922.5	922.5
	922.5	922.6	922.6	922.7	922.7	922.7	922.7	922.7	922.7	922.7
	922.8	922.8	922.8	922.8	922.9	922.9	923.0	923.0	923.2	923.5
	923.9	924.3	924.5	924.7	924.9					
0 9	920.4	920.6	920.8	921.1	921.5	921.9	922.2	922.4	922.4	922.5
	922.5	922.6	922.6	922.6	922.7	922.7	922.7	922.7	922.7	922.7
	922.7	922.8	922.8	922.8	922.9	922.9	923.0	923.0	923.2	923.5
	923.9	924.3	924.5	924.7	924.8					
0 10	920.4	920.5	920.7	921.1	921.4	921.9	922.2	922.3	922.4	922.5
	922.5	922.6	922.6	922.6	922.6	922.7	922.7	922.7	922.7	922.7
	922.7	922.7	922.8	922.8	922.9	922.9	922.9	923.0	923.2	923.5
	923.9	924.2	924.5	924.7	924.8					
0 11	920.4	920.5	920.7	921.0	921.4	921.8	922.2	922.3	922.4	922.5
	922.5	922.5	922.6	922.6	922.6	922.6	922.7	922.7	922.7	922.7
	922.7	922.7	922.8	922.8	922.8	922.9	922.9	923.0	923.2	923.5
	923.9	924.2	924.5	924.7	924.8					
0 12	920.3	920.5	920.7	921.0	921.4	921.8	922.2	922.3	922.4	922.5
	922.5	922.5	922.6	922.6	922.6	922.6	922.7	922.7	922.7	922.7
	922.7	922.7	922.8	922.8	922.8	922.9	922.9	923.0	923.2	923.5
	923.9	924.2	924.5	924.7	924.8					
0 13	920.3	920.4	920.7	921.0	921.4	921.8	922.2	922.3	922.4	922.4
	922.5	922.5	922.6	922.6	922.6	922.6	922.6	922.7	922.7	922.7
	922.7	922.7	922.8	922.8	922.8	922.9	922.9	923.0	923.2	923.5
	923.9	924.2	924.5	924.7	924.9					
0 14	920.3	920.4	920.6	921.0	921.4	921.8	922.1	922.3	922.4	922.4
	922.5	922.5	922.6	922.6	922.6	922.6	922.6	922.7	922.7	922.7
	922.7	922.7	922.7	922.8	922.8	922.9	922.9	923.0	923.1	923.5
	923.9	924.2	924.5	924.7	924.9					
0 15	920.3	920.4	920.6	921.0	921.4	921.8	922.1	922.3	922.4	922.4
	922.5	922.5	922.5	922.6	922.6	922.6	922.6	922.6	922.7	922.7
	922.7	922.7	922.7	922.8	922.8	922.9	922.9	923.0	923.1	923.5
	923.9	924.2	924.5	924.7	924.9					
0 16	920.3	920.4	920.6	921.0	921.3	921.8	922.1	922.3	922.4	922.4
	922.5	922.5	922.5	922.6	922.6	922.6	922.6	922.6	922.7	922.7
	922.7	922.7	922.7	922.8	922.8	922.9	922.9	923.0	923.1	923.5
	923.9	924.2	924.5	924.7	924.9					
0 17	920.2	920.4	920.6	920.9	921.3	921.8	922.1	922.3	922.4	922.4
	922.5	922.5	922.5	922.6	922.6	922.6	922.6	922.6	922.7	922.7
	922.7	922.7	922.7	922.8	922.8	922.9	922.9	923.0	923.1	923.5
	923.9	924.2	924.5	924.7	924.9					
0 18	920.2	920.4	920.6	920.9	921.3	921.8	922.1	922.3	922.4	922.4
	922.5	922.5	922.5	922.6	922.6	922.6	922.6	922.6	922.7	922.7
	922.7	922.7	922.7	922.8	922.8	922.9	922.9	923.0	923.1	923.5
	923.9	924.2	924.5	924.8	924.9					
0 19	920.2	920.3	920.6	920.9	921.3	921.8	922.1	922.3	922.4	922.4
	922.5	922.5	922.5	922.6	922.6	922.6	922.6	922.6	922.6	922.7
	922.7	922.7	922.7	922.8	922.8	922.8	922.9	923.0	923.1	923.5
	923.9	924.2	924.5	924.8	924.9					
0 20	920.2	920.3	920.6	920.9	921.3	921.8	922.1	922.3	922.4	922.4
	922.5	922.5	922.5	922.6	922.6	922.6	922.6	922.6	922.6	922.7
	922.7	922.7	922.7	922.8	922.8	922.8	922.9	923.0	923.1	923.5
	923.9	924.2	924.5	924.8	924.9					
0 21	920.2	920.3	920.6	920.9	921.3	921.8	922.1	922.3	922.3	922.4
	922.4	922.5	922.5	922.6	922.6	922.6	922.6	922.6	922.6	922.7
	922.7	922.7	922.7	922.8	922.8	922.8	922.9	923.0	923.1	923.5
	923.9	924.2	924.5	924.8	924.9					
0 22	920.2	920.3	920.6	920.9	921.3	921.7	922.1	922.3	922.3	922.4
	922.4	922.5	922.5	922.6	922.6	922.6	922.6	922.6	922.6	922.7
	922.7	922.7	922.7	922.8	922.8	922.8	922.9	923.0	923.1	923.5
	923.9	924.2	924.5	924.8	924.9					
0 23	920.1	920.3	920.5	920.9	921.3	921.7	922.1	922.3	922.3	922.4
	922.4	922.5	922.5	922.5	922.6	922.6	922.6	922.6	922.6	922.6
	922.7	922.7	922.7	922.8	922.8	922.8	922.9	923.0	923.1	923.5
	923.9	924.2	924.5	924.8	924.9					
0 24	920.1	920.2	920.5	920.8	921.3	921.7	922.1	922.2	922.3	922.4
	922.4	922.5	922.5	922.5	922.6	922.6	922.6	922.6	922.6	922.6
	922.7	922.7	922.7	922.7	922.8	922.8	922.9	923.0	923.1	923.5
	923.9	924.3	924.6	924.8	924.9					
0 25	920.1	920.2	920.5	920.8	921.2	921.7	922.1	922.2	922.3	922.4
	922.4	922.5	922.5	922.5	922.5	922.6	922.6	922.6	922.6	922.6
	922.6	922.7	922.7	922.7	922.8	922.8	922.9	923.0	923.1	923.5
	923.9	924.3	924.6	924.8	924.9					
0 26	920.0	920.2	920.4	920.8	921.2	921.7	922.1	922.2	922.3	922.4
	922.4	922.4	922.5	922.5	922.5	922.6	922.6	922.6	922.6	922.6
	922.6	922.7	922.7	922.7	922.8	922.8	922.9	922.9	923.1	923.5
	923.9	924.3	924.6	924.8	924.9					
0 27	920.0	920.1	920.4	920.8	921.2	921.7	922.0	922.2	922.3	922.3
	922.4	922.4	922.5	922.5	922.5	922.5	922.6	922.6	922.6	922.6
	922.6	922.6	922.7	922.7	922.8	922.8	922.9	922.9	923.1	923.4
	923.9	924.3	924.6	924.8	924.9					
0 28	919.9	920.0	920.3	920.7	921.1	921.6	922.0	922.2	922.3	922.3
	922.4	922.4	922.5	922.5	922.5	922.5	922.5	922.6	922.6	922.6
	922.6	922.6	922.7	922.7	922.7	922.8	922.8	922.9	923.1	923.4
	923.9	924.3	924.6	924.8	924.9					
0 29	919.7	919.9	920.2	920.6	921.0	921.6	922.0	922.1	922.2	922.3
	922.3	922.4	922.4	922.4	922.5	922.5	922.5	922.5	922.5	922.6
	922.6	922.6	922.6	922.7	922.7	922.8	922.8	922.9	923.1	923.4
	923.9	924.3	924.6	924.9	925.0					
0 30	919.2	919.4	919.8	920.3	920.8	921.4	921.8	922.0	922.1	922.2
	922.2	922.3	922.3	922.4	922.4	922.4	922.4	922.4	922.5	922.5
	922.5	922.5	922.6	922.6	922.7	922.7	922.8	922.9	923.0	923.4
	923.9	924.4	924.7	925.0	925.1					
0 31	918.4	918.7	919.2	919.8	920.5	921.1	921.6	921.9	922.0	922.0
	922.1	922.2	922.2	922.3	922.3	922.3	922.3	922.3	922.4	922.4
	922.4	922.4	922.5	922.5	922.6	922.6	922.7	922.8	923.0	923.5
	924.0	924.5	925.0	925.3	925.5					
0 32	917.2	917.7	918.4	919.3	920.1	920.9	921.5	921.7	921.8	921.9
	922.0	922.0	922.1	922.2	922.2	922.2	922.2	922.3	922.3	922.3
	922.3	922.4	922.4	922.5	922.5	922.6	922.7	922.8	923.0	923.5
	924.1	924.7	925.3	925.7	926.0					
0 33	915.5	916.4	917.5	918.6	919.7	920.6	921.3	921.6	921.7	921.8
	921.9	921.9	922.0	922.1	922.1	922.1	922.2	922.2	922.2	922.2
	922.3	922.3	922.3	922.4	922.5	922.5	922.6	922.8	923.0	923.6
	924.3	925.0	925.7	926.4	926.8					
0 34	912.5	914.6	916.5	918.1	919.4	920.4	921.2	921.5	921.6	921.7
	921.8	921.9	921.9	922.0	922.0	922.1	922.1	922.1	922.2	922.2

	922.2	922.2	922.3	922.4	922.4	922.5	922.6	922.8	923.0	923.6
	924.4	925.3	926.2	927.1	928.0					
0 35	905.0	912.6	915.7	917.7	919.1	920.3	921.1	921.4	921.6	921.7
	921.8	921.8	921.9	922.0	922.0	922.0	922.1	922.1	922.1	922.2
	922.2	922.2	922.3	922.4	922.4	922.5	922.6	922.8	923.0	923.7
	924.5	925.5	926.5	927.9	930.0					

1 DRAWDOWN IN LAYER 1 AT END OF TIME STEP 1 IN STRESS PERIOD 1

	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
	21	22	23	24	25	26	27	28	29	30
	31	32	33	34	35					
0 1	0.0000E+00	59.31	58.83	58.42	58.03	57.64	57.33	57.19	57.12	57.07
	57.03	56.99	56.96	56.93	56.91	56.89	56.88	56.86	56.85	56.83
	56.82	56.80	56.77	66.73	56.69	56.65	56.59	56.50	56.34	55.95
	55.43	54.87	54.21	53.34	0.0000E+00					
0 2	59.42	59.12	58.76	58.40	58.04	57.66	57.37	57.23	57.17	57.12
	57.08	57.05	57.01	56.98	56.97	56.95	56.94	56.92	56.91	56.89
	56.88	56.86	56.83	56.79	56.75	56.71	66.65	56.56	56.37	55.96
	55.49	54.99	54.44	53.85	53.29					
0 3	59.15	58.98	58.71	58.40	58.06	57.70	57.43	57.31	57.25	57.21
	57.18	57.16	57.13	67.11	57.10	57.09	57.08	57.07	57.06	57.05
	57.04	57.03	57.01	56.99	56.97	56.96	56.94	56.92	1.0000E+30	55.90
	55.57	55.16	54.74	54.34	54.05					
0 4	59.05	58.93	58.71	58.43	58.11	57.75	57.47	57.35	57.28	57.24
	57.20	57.17	57.14	57.11	57.10	57.08	57.07	57.06	57.04	57.03
	57.02	57.00	56.97	56.94	56.90	56.86	56.81	56.73	56.56	56.16
	55.75	55.37	55.02	54.72	54.55					
0 5	59.08	58.98	58.78	58.51	58.19	57.83	57.54	57.41	57.34	57.29
	57.26	57.22	57.19	57.16	57.14	57.13	57.11	57.10	57.09	57.07
	57.06	57.04	57.01	56.98	56.94	56.91	56.85	56.78	56.63	56.30
	55.90	55.54	55.24	55.00	54.87					
0 6	59.22	59.12	58.92	58.64	58.31	57.94	57.63	57.50	57.43	57.37
	57.34	57.30	57.27	57.24	57.22	57.21	57.20	57.18	57.17	57.15
	57.14	57.12	57.09	57.06	57.02	56.99	56.93	56.86	56.72	56.41
	56.02	55.67	55.39	55.18	55.07					
0 7	59.40	59.29	59.08	58.79	58.44	58.04	57.72	57.58	57.51	57.45
	57.42	57.38	57.34	57.31	57.30	57.28	57.27	57.25	57.24	57.22
	57.21	57.19	57.16	57.13	57.09	57.05	57.00	56.93	56.78	56.47
	56.07	55.73	55.45	55.24	55.14					
0 8	59.50	59.39	59.17	58.87	58.50	58.09	57.77	57.62	57.55	57.49
	57.45	57.42	57.38	57.35	57.33	57.32	57.30	57.29	57.27	57.26
	57.24	57.22	57.19	57.16	57.12	57.08	57.03	66.95	56.81	56.49
	56.09	55.74	55.46	55.26	55.15					
0 9	59.56	59.44	59.22	58.91	58.54	58.12	57.79	57.64	57.57	57.51
	57.47	57.43	57.40	57.37	57.35	57.33	57.32	57.30	57.29	57.27
	57.26	57.24	57.21	57.17	57.13	57.10	57.04	56.97	56.82	56.50
	56.10	55.75	55.46	55.26	55.15					
0 10	59.60	59.48	59.25	58.94	58.56	58.14	57.81	57.66	57.58	57.52
	57.49	57.45	57.41	57.38	57.36	57.35	57.33	57.32	57.30	57.29
	57.27	57.25	57.22	57.18	57.15	57.11	57.05	56.98	56.83	56.51
	56.10	55.75	55.46	55.26	55.15					
0 11	59.63	59.51	59.28	58.96	58.58	58.16	57.82	57.67	57.59	57.53
	57.50	57.46	57.42	57.39	57.37	57.36	57.34	57.32	57.31	57.29
	57.28	57.26	57.23	57.19	57.15	57.12	57.06	56.98	56.84	56.51
	56.11	55.75	55.46	55.26	55.15					
0 12	59.66	59.53	59.30	58.98	58.60	58.17	57.83	57.68	57.60	57.54
	57.51	57.47	57.43	57.40	57.38	57.36	57.35	57.33	57.32	57.30
	57.29	57.27	57.24	57.20	57.16	57.12	57.07	56.99	56.84	56.51
	56.11	55.75	55.46	55.26	55.15					
0 13	59.69	59.56	59.33	59.01	58.62	58.19	57.84	57.69	57.61	57.55
	57.52	57.48	57.44	57.41	57.39	57.37	57.36	57.34	57.33	57.31
	57.30	57.28	57.25	57.21	57.17	57.13	57.07	57.00	56.85	56.52
	56.11	55.75	55.46	55.26	55.15					
0 14	59.71	59.59	59.35	59.02	58.63	58.20	57.85	57.70	57.62	57.56
	57.52	57.48	57.45	57.42	57.40	57.38	57.36	57.35	57.33	57.32
	57.30	57.28	57.25	57.21	57.18	57.14	57.08	57.00	56.85	56.52
	56.11	55.75	55.46	55.25	55.15					
0 15	59.73	69.60	59.36	59.04	58.64	58.21	57.86	57.70	57.63	57.57
	57.53	57.49	57.45	57.42	57.40	57.38	57.37	57.35	57.34	57.32
	57.31	57.29	57.26	57.22	57.18	57.14	57.08	57.01	56.86	56.52
	56.11	55.75	55.46	55.25	55.14					
0 16	59.74	59.62	59.38	59.05	58.65	58.21	57.86	57.71	57.63	57.57
	57.53	57.49	57.45	57.42	57.40	57.39	57.37	57.36	57.34	57.33
	57.31	57.29	57.26	57.22	57.18	57.14	57.09	57.01	56.86	56.53
	56.11	55.75	55.46	55.25	55.14					
0 17	59.76	59.63	59.39	59.06	58.66	58.22	57.87	57.71	57.63	57.58
	57.54	57.50	57.46	57.43	57.41	57.39	57.38	57.36	57.34	57.33
	57.31	57.29	57.26	57.22	57.19	57.15	57.09	57.01	56.86	56.53
	56.12	55.75	55.46	55.25	55.14					
0 18	59.77	59.64	59.40	59.06	58.67	58.22	57.87	57.72	57.64	57.58
	57.54	57.50	57.46	57.43	65.41	57.40	57.38	57.36	57.35	57.33
	57.32	57.30	57.27	57.23	57.19	57.15	57.09	57.01	56.86	56.53
	56.12	55.75	55.46	55.25	55.14					
0 19	59.78	59.65	59.41	59.07	58.67	58.23	57.88	57.72	57.64	57.58
	57.54	57.51	57.47	65.43	57.41	57.40	57.38	57.37	57.35	57.34
	57.32	57.30	57.27	57.23	57.19	57.15	57.09	57.02	56.86	56.53
	56.12	55.75	55.46	55.25	55.14					
0 20	59.80	59.67	59.42	59.08	58.68	58.24	57.88	57.73	57.65	57.59
	57.55	57.51	57.47	57.44	57.42	57.40	57.39	57.37	57.36	57.34
	57.32	57.30	57.27	57.23	57.19	57.16	57.10	57.02	56.87	56.53
	56.12	55.75	55.46	55.25	55.14					
0 21	59.81	59.68	59.43	59.09	58.69	58.24	57.89	57.73	57.65	57.59
	57.55	57.51	57.47	57.44	57.42	57.41	57.39	57.37	57.36	57.34
	57.33	57.31	57.28	57.24	57.20	57.16	57.10	57.02	56.87	56.53
	56.12	55.75	55.46	55.24	55.13					
0 22	59.83	59.70	59.45	59.11	58.70	58.25	57.90	57.74	57.66	57.60
	57.56	57.52	57.48	67.45	57.43	57.41	57.39	57.38	57.36	57.35
	57.33	57.31	57.28	57.24	67.20	57.16	57.10	57.03	56.87	56.53
	56.12	55.75	55.45	55.24	55.13					
0 23	59.86	59.72	59.47	59.13	58.72	58.26	57.91	57.75	57.67	57.61
	57.57	57.53	57.49	67.45	57.43	57.42	57.40	57.39	57.37	57.35
	57.34	57.32	57.29	57.25	57.21	57.17	57.11	57.03	56.88	56.54
	56.12	55.75	55.45	55.24	55.13					
0 24	59.89	59.76	59.50	59.15	58.74	58.28	57.92	57.76	57.68	57.62
	57.58	57.54	57.50	57.46	57.44	57.43	57.41	57.39	65.38	57.36

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          57.35      57.33      57.29      57.26      57.22      57.18      57.12      57.04      56.88      56.54
          56.12      55.75      55.45      55.23      55.12
 0 25     59.93      59.79      59.53      59.18      58.76      58.30      57.93      57.77      67.69      57.63
          57.59      57.55      57.51      57.47      57.45      57.44      57.42      57.40      57.39      57.37
          57.36      57.34      57.30      57.26      57.22      57.18      57.12      57.04      56.89      56.54
          56.12      55.75      55.44      55.23      55.11
 0 26     59.97      59.83      59.57      59.21      58.78      58.31      57.95      57.78      67.70      57.64
          57.60      57.56      57.51      57.48      57.46      57.45      57.43      57.41      57.40      57.38
          57.36      57.34      57.31      57.27      57.23      57.19      57.13      57.05      56.89      56.55
          56.12      55.74      55.44      55.22      55.10
 0 27     60.03      59.88      59.61      59.25      58.81      58.34      57.97      57.80      57.72      57.65
          57.61      57.57      57.53      57.50      57.48      57.46      57.44      57.43      57.41      57.39
          57.38      57.36      57.32      57.28      57.24      57.20      57.14      57.06      56.90      56.55
          56.12      55.74      55.43      55.21      55.09
 0 28     60.11      59.96      59.68      59.30      58.86      58.37      57.99      57.82      57.74      57.68
          57.63      57.59      57.55      57.52      57.49      57.48      57.46      57.44      57.43      57.41
          57.39      57.37      57.34      57.30      57.26      57.22      57.15      57.07      56.91      56.55
          56.12      55.73      55.41      55.19      55.07
 0 29     60.29      60.13      59.83      59.42      58.95      58.44      58.05      57.87      57.78      65.72
          57.68      57.63      57.59      57.55      57.53      57.51      57.50      57.48      57.46      57.45
          57.43      57.41      57.37      57.33      57.29      57.24      57.18      57.10      56.93      56.56
          56.11      55.71      55.38      55.14      55.02
 0 30     60.76      60.56      60.19      59.72      59.18      58.61      58.18      57.99      57.89      57.82
          57.77      57.72      57.68      57.64      57.62      57.60      57.58      57.56      57.54      57.52
          57.50      57.48      57.44      57.40      57.35      57.30      57.23      57.14      56.96      56.57
          56.08      55.64      55.27      55.01      54.86
 0 31     61.60      61.31      60.81      60.20      59.53      58.86      58.36      58.14      58.03      57.95
          57.90      57.85      57.79      57.75      57.72      57.70      57.68      57.66      57.64      57.62
          57.60      57.57      57.53      57.48      57.42      57.37      57.29      57.19      56.99      56.54
          55.99      55.48      55.04      54.70      54.51
 0 32     62.78      62.31      61.57      60.75      59.92      59.12      58.54      58.29      58.17      58.08
          58.02      57.96      57.90      57.85      57.82      57.80      57.77      57.75      57.72      57.70
          57.68      57.65      57.60      57.54      57.48      57.43      57.34      57.22      57.00      56.50
          55.86      55.25      54.71      54.26      53.98
 0 33     64.54      63.65      62.49      61.35      60.31      59.36      58.71      58.43      58.29      58.19
          58.12      58.06      57.99      57.94      57.90      57.88      57.85      57.82      57.80      57.77
          57.74      57.71      57.66      57.59      57.53      57.46      57.37      57.24      56.99      56.43
          55.71      54.99      54.29      53.65      53.20
 0 34     67.52      65.42      63.48      61.92      60.65      59.56      58.84      58.53      58.38      58.27
          58.20      58.13      58.06      58.00      57.96      57.93      57.90      57.88      57.85      57.82
          57.79      57.76      57.70      57.63      57.56      57.49      57.39      57.25      56.98      56.37
          55.56      54.72      53.83      52.88      51.99
 0 35   0.0000E+00   67.42      64.28      62.30      60.85      59.68      58.91      58.59      58.44      58.32
          58.24      58.17      58.09      58.03      57.99      57.96      57.93      57.90      57.87      57.85
          57.82      57.78      57.72      57.65      57.57      57.50      57.39      57.25      56.97      56.33
          55.47      54.54      53.47      52.08    0.0000E+00
0

                                       VOLUMETRIC BUDGET FOR ENTIRE MODEL AT END OF TIME STEP  1 IN STRESS PERIOD  1
                                       ----------------------------------------------------------------------------
0                              CUMULATIVE VOLUMES      L**3                                     RATES FOR THIS TIME STEP      L**3/T
                               ------------------                                               ------------------------

                                     IN:                                                              IN:
                                     ---                                                              ---
                                         STORAGE =   0.00000E+00                                          STORAGE =   0.00000E+00
                                   CONSTANT HEAD =   0.89271E-01                                    CONSTANT HEAD =   0.89271E-02
0                                       TOTAL IN =   0.89271E-01                                         TOTAL IN =   0.89271E-02
0                                   OUT:                                                             OUT:
                                    ----                                                             ----
                                         STORAGE =   0.00000E+00                                          STORAGE =   0.00000E+00
                                   CONSTANT HEAD =   0.89600E-01                                    CONSTANT HEAD =   0.89600E-02
0                                      TOTAL OUT =   0.89600E-01                                        TOTAL OUT =   0.89600E-02
0                                       IN - OUT =  -0.32936E-03                                         IN - OUT =  -0.32935E-04
0                           PERCENT DISCREPANCY =              -0.37                      PERCENT DISCREPANCY =              -0.37


0

                 TIME SUMMARY AT END OF TIME STEP  1 IN STRESS PERIOD  1
                                          SECONDS        MINUTES          HOURS           DAYS           YEARS
                                     -----------------------------------------------------------------------------
            TIME STEP LENGTH              10.0000        0.166667      0.277778E-02   0.115741E-03   0.316881E-06
          STRESS PERIOD TIME              10.0000        0.166667      0.277778E-02   0.115741E-03   0.316881E-06
       TOTAL SIMULATION TIME              10.0000        0.166667      0.277778E-02   0.115741E-03   0.316881E-06
1
```

MODFLOW Simulation and Actual Head Comparisons including Simulated Discharge Drawdowns
At 7S (proposed CAP well RW-3)
K=1.2x10e-3 ft/min   Q=4gpm
b = 28 to 58 feet

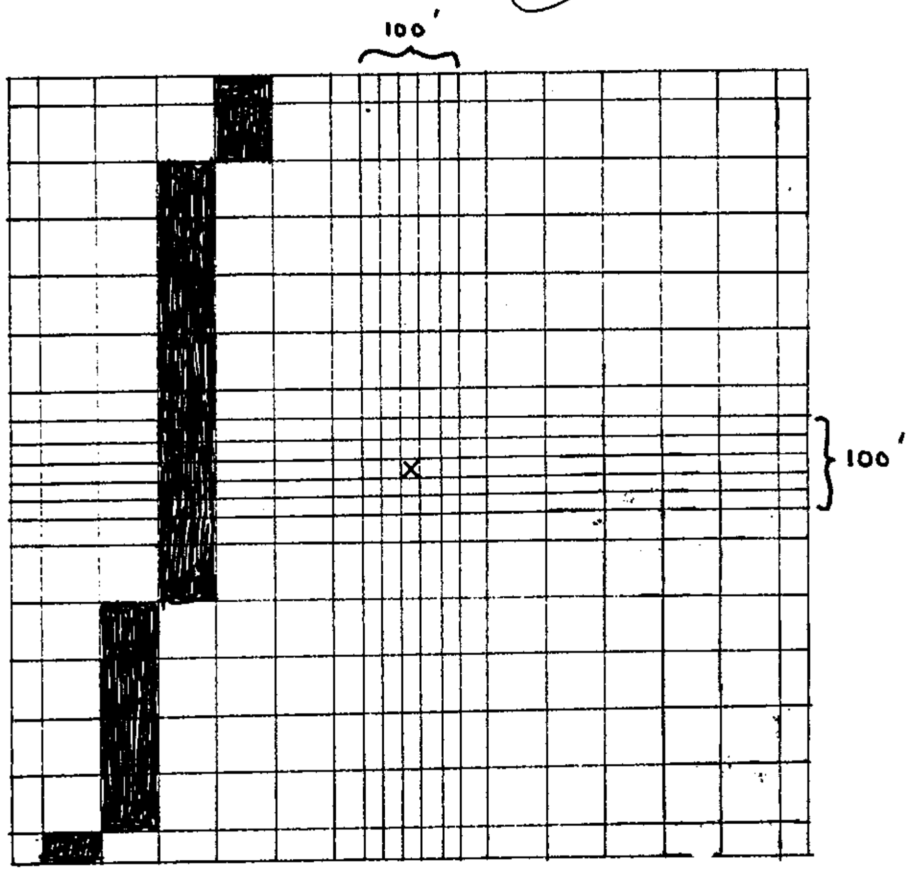
CELL NUMBER	ACTUAL HEAD	SIMULATED STEADY-STATE HEAD	HEAD DIFFERENCE	SIMULATED PUMPING HEAD	SIMULATED DRAWDOWN	RADIAL DISTANCE	CONSTANT HEAD CELL
1,1	896	891.1	-4.9	891.1	0	560	NO
1,35	905.2	895.3	-9.9	894.6	-0.7	560	NO
5,5	887	885	-2	884.5	-0.5	240	NO
5,31	900.8	895	-5.8	894	-1	240	NO
8,8	892	888.2	-3.8	885	-3.2	65	NO
8,28	896.4	892.1	-4.3	889.1	-3	65	NO
10,10	892.2	888.9	-3.3	884.8	-4.1	38	NO
10,26	893.4	891.4	-2	887.4	-4	38	NO
14,14	892.5	889.8	-2.7	883.3	-6.5	12	NO
14,22	892.6	890.6	-2	884.2	-6.4	12	NO
18,18	892.5	890.1	-2.4	875.9	-14.2	0	NO
22,14	892.4	889.7	-2.7	883.2	-6.5	12	NO
22,22	892.6	890.5	-2.1	884.1	-6.4	12	NO
26,10	892	888.7	-3.3	884.5	-4.2	38	NO
26,26	892.6	891.4	-1.2	887.4	-4	38	NO
28,8	890.4	887.8	-2.6	884.5	-3.3	65	NO
28,28	894.5	892.2	-2.3	889.3	-2.9	65	NO
31,5	877.5	880	2.5	879.2	-0.8	240	NO
31,31	896	897.1	1.1	896.4	-0.7	240	NO
35,1	874	870.7	-3.3	870.7	0	560	NO
35,35	896	900	4	900	0	560	NO

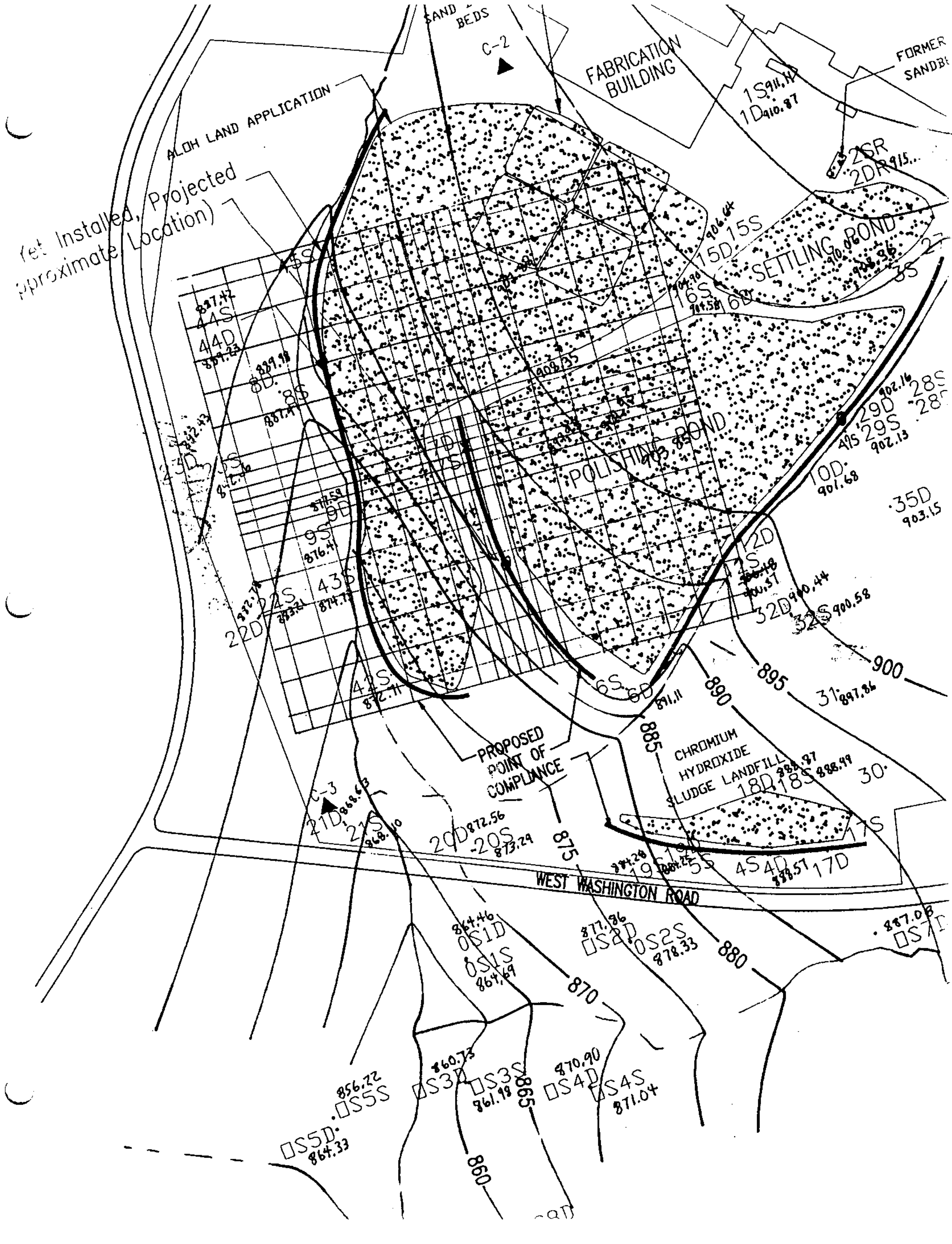
NOTES:

1. Cell Number - row then column for (i,j) notation.
2. Actual Head - interpolated from 8/21/91 water table map at block centered (i,j) location.
3. Simulated Steady-State Head - MODFLOW Simulated Head without discharge stress from pumping well.
4. Head Difference - MODFLOW Simulated Steady-State Head minus Actual Head.
5. Simulated Pumping Head - MODFLOW Simulated Head with discharge stress from pumping well located at (i,j)=(19,19).
6. Simulated Drawdown - MODFLOW Simulated Pumping Head minus MODFLOW Simulated Steady-State Head.
7. Radial Distance - (i,j) block centered distance from discharge (i,j) cell.
8. Constant Head Cell - cell that corresponds to known hydrogeologic constant head boundaries such as a stream or creek.
9. Estimated Recovery Head - Actual Head minus Simulated Drawdown.

NOTE: FINE DISCRETISATION OF GRID IN THE CENTRAL 100 FEET ZONE NOT DRAWN FOR CLARITY. THIS ZONE WAS DISCRETISED FROM 10 FEET TO 2 FEET.

@7D





SAND BEDS
C-2
FABRICATION BUILDING
FORMER SANDBE
ALOH LAND APPLICATION
Yet Installed, Projected
Approximate Location)
1S 911.14
1D 910.87
2SR
2DR 915
15D 15S
SETTLING POND
16S
6D
44S
44D
8D
8S
POLISHING POND
28S
29D
29S
10D 901.68
35D 903.15
9D
9S
43S
22D
21S
12D
2S
32D 900.44
32S 900.58
900
895
890
31 897.86
42S 872.11
6S
6D 891.11
885
PROPOSED POINT OF COMPLIANCE
CHROMIUM HYDROXIDE SLUDGE LANDFILL
18D 18S
30
C-3
21D 868.63
21S
20D 872.56
20S 873.29
875
17S
19S 19D
5S
4S 4D
17D
WEST WASHINGTON ROAD
OS1D 864.46
OS1S 864.69
OS2D 877.86
OS2S 878.33
880
OS7D 887.08
870
OS5S 856.22
OS3D 860.73
OS3S 861.98
865
OS4D 870.90
OS4S 871.04
OS5D 864.33
860

1 U.S. GEOLOGICAL SURVEY MODULAR FINITE-DIFFERENCE GROUND-WATER MODEL
0BONMOD2 1 layer, 35 rows, 35 columns, 0 well unconfined, impermeable bedrock 7S/D
1 LAYERS 35 ROWS 35 COLUMNS
1 STRESS PERIOD(S) IN SIMULATION
MODEL TIME UNIT IS SECONDS
0I/O UNITS:
ELEMENT OF IUNIT: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
I/O UNIT: 11 12 0 0 0 0 0 0 19 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0BAS1 -- BASIC MODEL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 1
ARRAYS RHS AND BUFF WILL SHARE MEMORY.
START HEAD WILL BE SAVED
11099 ELEMENTS IN X ARRAY ARE USED BY BAS
11099 ELEMENTS OF X ARRAY USED OUT OF 30000
0BCF1 -- BLOCK-CENTERED FLOW PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 11
STEADY-STATE SIMULATION

LAYER	AQUIFER TYPE
1	1

2451 ELEMENTS IN X ARRAY ARE USED BY BCF
13550 ELEMENTS OF X ARRAY USED OUT OF 30000
0WEL1 -- WELL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM 12
MAXIMUM OF 1 WELLS
4 ELEMENTS IN X ARRAY ARE USED FOR WELLS
13554 ELEMENTS OF X ARRAY USED OUT OF 30000
0SIP1 -- STRONGLY IMPLICIT PROCEDURE SOLUTION PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 19
MAXIMUM OF 100 ITERATIONS ALLOWED FOR CLOSURE
5 ITERATION PARAMETERS
5305 ELEMENTS IN X ARRAY ARE USED BY SIP
18859 ELEMENTS OF X ARRAY USED OUT OF 30000
1BONMOD2 1 layer, 35 rows, 35 columns, 0 well unconfined, impermeable bedrock 7S/D
0

BOUNDARY ARRAY FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35I2)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
0 1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 2	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 3	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 4	-1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 5	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 6	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 7	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 8	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 9	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 10	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 11	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 12	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 13	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 14	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 15	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 16	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 17	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 18	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 19	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 20	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 21	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 22	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 23	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 24	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 25	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 26	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 27	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 28	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 29	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 30	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1
0 31	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 32	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 33	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1
0 34	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1
0 35	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					

75/70.2
WELL

1 1 -1 1 1
0AQUIFER HEAD WILL BE SET TO 999.90 AT ALL NO-FLOW NODES (IBOUND=0).
0

INITIAL HEAD FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35F5.0)

	1 16 31	2 17 32	3 18 33	4 19 34	5 20 35	6 21	7 22	8 23	9 24	10 25	11 26	12 27	13 28	14 29	15 30
0 1	880.0	880.0	880.0	880.0	886.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 2	880.0	880.0	880.0	880.0	885.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 3	880.0	880.0	880.0	884.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 4	900.0	880.0	880.0	884.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 5	880.0	880.0	880.0	884.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 6	880.0	880.0	880.0	883.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 7	880.0	880.0	880.0	879.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 8	880.0	880.0	880.0	879.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 9	880.0	880.0	880.0	878.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 10	880.0	880.0	880.0	878.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 11	880.0	880.0	880.0	878.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 12	880.0	880.0	880.0	877.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 13	880.0	880.0	880.0	877.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 14	880.0	880.0	880.0	877.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 15	880.0	880.0	880.0	877.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 16	880.0	880.0	880.0	877.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 17	880.0	880.0	880.0	876.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 18	880.0	880.0	880.0	876.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	~~880.0~~	903.0	880.0	880.0	880.0										
0 19	900.0	880.0	880.0	876.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 20	880.0	880.0	880.0	876.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 21	880.0	880.0	880.0	876.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 22	880.0	880.0	880.0	875.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 23	880.0	880.0	880.0	875.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 24	880.0	880.0	880.0	875.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 25	880.0	880.0	880.0	875.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 26	880.0	880.0	880.0	875.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 27	880.0	880.0	880.0	875.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 28	880.0	880.0	880.0	875.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 29	880.0	880.0	880.0	875.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 30	880.0	880.0	880.0	874.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	903.0	880.0	880.0										
0 31	880.0	880.0	874.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 32	880.0	880.0	873.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										

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0 33     880.0   880.0   871.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
         880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
         880.0   880.0   880.0   880.0   900.0
0 34     880.0   880.0   871.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
         880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
         880.0   880.0   880.0   900.0   880.0
0 35     880.0   870.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
         880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
         880.0   880.0   900.0   880.0   880.0
0DEFAULT OUTPUT CONTROL -- THE FOLLOWING OUTPUT COMES AT THE END OF EACH STRESS PERIOD:
 TOTAL VOLUMETRIC BUDGET
          HEAD
          DRAWDOWN
0                                          COLUMN TO ROW ANISOTROPY =   1.000000
0

                                                DELR WILL BE READ ON UNIT 11 USING FORMAT:            (35F4.0)
                        ------------------------------------------------------------------------------

   60.000        60.000        60.000        60.000        60.000        60.000        30.000        10.000        10.000        5.0000
   5.0000        5.0000        5.0000        3.0000        2.0000        2.0000        2.0000        2.0000        2.0000        2.0000
   2.0000        3.0000        5.0000        5.0000        5.0000        5.0000        10.000        10.000        30.000        60.000
   60.000        60.000        60.000        60.000        60.000
0

                                                DELC WILL BE READ ON UNIT 11 USING FORMAT:            (35F4.0)
                        ------------------------------------------------------------------------------

   60.000        60.000        60.000        60.000        60.000        60.000        30.000        10.000        10.000        5.0000
   5.0000        5.0000        5.0000        3.0000        2.0000        2.0000        2.0000        2.0000        2.0000        2.0000
   2.0000        3.0000        5.0000        5.0000        5.0000        5.0000        10.000        10.000        30.000        60.000
   60.000        60.000        60.000        60.000        60.000
0                                                     HYD. COND. ALONG ROWS =  0.2000000E-04 FOR LAYER  1
0                                                                    BOTTOM =   845.0000      FOR LAYER  1
0


                                                        SOLUTION BY THE STRONGLY IMPLICIT PROCEDURE
                                                        -------------------------------------------
0                                               MAXIMUM ITERATIONS ALLOWED FOR CLOSURE =       100
                                                                ACCELERATION PARAMETER =      1.0000
                                                   HEAD CHANGE CRITERION FOR CLOSURE =    0.10000E-02
                                                   SIP HEAD CHANGE PRINTOUT INTERVAL =        1
0
    5 ITERATION PARAMETERS CALCULATED FROM SPECIFIED WSEED = 0.00100000 :

          0.0000000E+00  0.8221720E+00  0.9683772E+00  0.9943766E+00  0.9990000E+00
1                                                  STRESS PERIOD NO.   1, LENGTH =   1728000.
                                                   ----------------------------------------------

                                                  NUMBER OF TIME STEPS =    20

                                                    MULTIPLIER FOR DELT =    1.000

                                                 INITIAL TIME STEP SIZE =   86400.00
0             1 WELLS
                                               LAYER     ROW     COL     STRESS RATE    WELL NO.
                                               ---------------------------------------------
                                                 1        18      18     -0.10000E-01       1
0**********NODE   1  19   1 (LAYER,ROW,COL) WENT DRY AT ITERATION =  1  TIME STEP =  1  STRESS PERIOD =  1
0
    26 ITERATIONS FOR TIME STEP   1 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
    21.27      (  1, 13, 32)  9.370       (  1, 32, 34)  8.310       (  1, 10, 35)  7.317       (  1,  1, 35)  3.815       (  1, 19, 16)
   0.7991      (  1, 18, 18)  0.3884      (  1, 18, 18)  0.7634      (  1, 19, 16)  0.8143      (  1, 16, 13)  0.8400      (  1, 15, 24)
   0.1169      (  1, 18, 18) -0.9404E-01 (  1, 26, 13) -0.7681E-01 (  1, 25,  9) -0.8087E-01 (  1, 24, 15) -0.9466E-01 (  1, 12, 15)
   0.1484E-01 (  1,  9, 11)  0.1532E-01 (  1, 10, 12) -0.1096E-01 (  1,  8, 27) -0.1223E-01 (  1, 10, 27)  0.1399E-01 (  1, 19, 10)
  -0.3899E-02 (  1, 25,  7)  0.4001E-02 (  1, 24, 14) -0.2742E-02 (  1, 16,  9) -0.6280E-02 (  1, 14, 11) -0.4056E-02 (  1, 22, 16)
   0.6453E-03 (  1, 14, 11)
0
     1 ITERATIONS FOR TIME STEP   2 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.4290E-03 (  1, 16, 11)
0
     1 ITERATIONS FOR TIME STEP   3 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.2910E-03 (  1, 16, 11)
0
     1 ITERATIONS FOR TIME STEP   4 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.2193E-03 (  1, 16, 10)
0
     1 ITERATIONS FOR TIME STEP   5 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.1695E-03 (  1, 16, 10)
0
     1 ITERATIONS FOR TIME STEP   6 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.1364E-03 (  1, 16, 10)
0
     1 ITERATIONS FOR TIME STEP   7 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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    0.1118E-03 (  1, 15, 10)
0
      1 ITERATIONS FOR TIME STEP   8 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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    0.9372E-04 (  1, 15, 10)
0
      1 ITERATIONS FOR TIME STEP   9 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
    0.7953E-04 (  1, 15, 10)
0
      1 ITERATIONS FOR TIME STEP  10 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
    0.6829E-04 (  1, 15, 10)
0
      1 ITERATIONS FOR TIME STEP  11 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
    0.5936E-04 (  1, 14, 10)
0
      1 ITERATIONS FOR TIME STEP  12 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
    0.5199E-04 (  1, 14, 10)
0
      1 ITERATIONS FOR TIME STEP  13 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
    0.4574E-04 (  1, 14, 10)
0
      1 ITERATIONS FOR TIME STEP  14 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
    0.4082E-04 (  1, 13,  9)
0
      1 ITERATIONS FOR TIME STEP  15 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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    0.3663E-04 (  1, 13,  9)
0
      1 ITERATIONS FOR TIME STEP  16 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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    0.3280E-04 (  1, 13,  9)
0
      1 ITERATIONS FOR TIME STEP  17 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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    0.2949E-04 (  1, 13,  9)
0
      1 ITERATIONS FOR TIME STEP  18 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
    0.2654E-04 (  1, 12,  9)
0
      1 ITERATIONS FOR TIME STEP  19 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
    0.2383E-04 (  1, 13,  9)
0
      1 ITERATIONS FOR TIME STEP  20 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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    0.2146E-04 (  1, 12,  9)
0
1
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HEAD IN LAYER 1 AT END OF TIME STEP 20 IN STRESS PERIOD 1

	1 11 21 31	2 12 22 32	3 13 23 33	4 14 24 34	5 15 25 35	6 16 26	7 17 27	8 18 28	9 19 29	10 20 30
0 1	891.1	890.0	888.4	886.8	886.0	886.9	887.7	888.1	888.3	888.5
	[illegible]	888.7	888.8	888.9	888.9	889.0	889.0	889.1	889.1	889.1
	889.2	889.2	889.3	889.4	889.5	889.6	889.8	890.0	890.4	891.3
	892.3	893.2	893.9	894.4	894.6					
0 2	892.1	890.5	888.3	886.1	[illegible]	886.6	887.6	888.0	888.3	888.4
	888.5	888.6	888.7	888.8	888.9	888.9	889.0	889.0	889.1	889.1
	889.2	889.2	889.3	889.4	889.5	889.6	889.8	890.0	890.4	891.3
	892.5	893.4	894.1	894.6	894.8					
0 3	894.7	891.5	888.0	884.0	885.1	886.4	887.4	887.9	888.1	888.3
	888.4	888.6	888.7	888.8	888.8	888.9	888.9	889.0	889.0	889.1
	889.1	889.2	889.3	889.4	889.5	889.6	889.8	890.0	890.5	891.5
	892.8	893.8	894.6	895.1	895.3					
0 4	900.0	892.5	887.9	884.0	884.9	886.1	887.2	887.7	888.0	888.1
	888.3	888.4	888.5	888.6	888.7	888.8	888.8	888.9	888.9	889.0
	889.0	889.1	889.2	889.3	889.5	889.6	889.8	890.1	890.6	891.8
	893.3	894.4	895.3	895.8	896.0					
0 5	893.0	889.8	886.6	884.0	884.5	885.6	886.7	887.3	887.6	887.8
	887.9	888.1	888.2	888.3	[illegible]	888.5	888.5	888.6	888.7	888.7
	[illegible]	888.9	889.0	889.2	889.3	889.5	889.7	890.0	890.7	892.2
	894.0	895.4	896.3	896.7	896.9					

0 6	888.5	886.6	884.5	883.0	883.4	884.7	885.9	886.5	886.8	887.1
	887.2	887.4	887.6	887.7	887.8	887.9	888.0	888.0	888.1	888.2
	888.3	888.4	888.5	888.7	888.9	889.1	889.4	889.8	890.7	892.6
	895.0	896.9	897.7	897.9	898.0					
0 7	886.2	884.3	882.1	879.0	881.8	883.7	885.0	885.5	885.8	886.1
	886.2	886.4	886.6	886.7	886.8	886.9	887.0	887.1	887.2	887.3
	887.4	887.5	887.7	887.9	888.2	888.4	888.8	889.4	890.5	893.0
	896.1	898.8	899.0	898.9	898.8					
0 8	885.5	883.3	881.2	879.0	881.2	883.3	884.5	885.0	885.2	885.4
	885.6	885.7	885.9	886.0	886.1	886.2	886.3	~~886.4~~	886.5	886.6
	886.7	886.8	887.0	887.3	887.6	887.9	888.4	889.1	890.4	893.2
	896.7	899.9	899.7	899.4	899.2					
0 9	885.1	882.8	880.7	878.0	880.9	883.1	884.3	884.7	884.9	885.1
	885.2	885.3	885.4	885.5	885.6	885.7	885.8	885.9	886.0	886.1
	886.2	886.3	886.6	886.9	887.3	887.7	888.2	888.9	890.4	893.2
	896.9	900.6	900.0	899.6	899.4					
0 10	885.0	882.3	880.3	878.0	880.7	883.0	884.2	884.5	884.7	884.8
	884.8	884.9	885.0	885.1	885.2	~~885.2~~	885.3	885.4	885.5	~~885.0~~
	885.7	885.9	886.2	886.6	887.0	887.4	888.0	888.8	890.3	893.3
	897.1	901.2	900.3	899.7	899.5					
0 11	884.8	882.1	880.1	878.0	880.6	882.9	884.1	884.4	884.5	884.6
	884.6	884.6	884.6	884.7	884.8	884.8	884.9	885.0	885.1	885.2
	885.4	885.6	885.9	886.3	886.8	887.3	887.9	888.8	890.3	893.3
	897.2	901.6	900.4	899.8	899.6					
0 12	884.7	881.8	879.8	877.0	880.4	882.8	884.0	884.3	884.4	884.4
	884.3	884.3	884.3	884.3	884.3	884.3	884.4	884.5	884.6	884.8
	884.9	885.1	885.5	886.1	886.6	887.1	887.8	888.7	890.3	893.4
	897.4	902.1	900.6	899.9	899.7					
0 13	884.7	881.5	879.6	877.0	880.3	882.7	883.9	884.2	884.2	884.2
	884.1	884.0	883.9	883.8	883.7	883.7	883.7	883.8	883.9	884.1
	884.3	884.6	885.2	885.8	886.4	887.0	887.7	888.7	890.3	893.4
	897.5	902.6	900.7	900.0	899.7					
0 14	884.6	881.2	879.4	~~872.0~~	880.2	882.7	883.9	884.1	884.1	884.1
	884.0	~~883.8~~	883.5	883.3	883.1	883.0	882.9	883.0	883.1	883.4
	883.7	884.2	884.8	~~885.6~~	886.3	886.9	887.7	888.6	890.3	893.5
	897.6	~~903.0~~	900.8	900.1	899.8					
0 15	884.6	881.1	879.2	877.0	880.1	882.6	883.8	884.1	884.1	884.0
	883.9	883.7	883.3	882.9	882.7	882.4	882.2	882.2	882.4	882.9
	883.3	883.9	884.7	885.5	886.2	886.8	887.7	888.6	890.3	893.5
	897.6	903.0	900.9	900.2	899.8					
0 16	884.6	880.9	879.1	877.0	880.1	882.6	883.8	884.1	884.1	884.0
	883.8	883.6	883.2	882.7	882.3	881.9	881.5	881.3	881.7	882.3
	883.0	883.6	884.6	885.4	886.2	886.8	887.6	888.6	890.3	893.5
	897.6	903.0	901.0	900.2	899.9					
0 17	884.6	880.8	879.0	876.0	880.0	882.6	883.8	884.0	884.1	883.9
	883.8	883.6	883.1	882.6	882.0	881.4	880.5	879.7	880.8	881.8
	882.7	883.5	884.5	885.4	886.2	886.8	887.6	888.6	890.3	893.5
	897.7	903.0	901.0	900.2	899.9					
0 18	884.6	880.6	879.0	876.0	880.0	882.5	883.8	~~884.0~~	884.0	883.9
	883.8	883.5	883.1	882.5	881.9	881.0	879.6	875.9	879.8	881.5
	882.5	883.4	884.5	885.4	886.1	886.8	887.6	~~888.6~~	890.3	893.5
	897.7	903.0	901.1	900.3	899.9					
0 19	~~1.0000E+30~~	880.5	878.9	876.0	879.9	882.5	883.8	884.0	884.0	883.9
	883.8	883.5	883.1	882.5	882.0	881.4	880.5	879.7	880.8	881.8
	882.7	883.5	884.5	885.4	886.2	886.8	887.6	888.6	890.3	893.5
	897.7	903.0	901.1	900.3	900.0					
0 20	877.8	880.4	878.8	876.0	879.9	882.5	883.8	884.0	884.0	883.9
	883.8	883.6	883.2	882.7	882.3	881.9	881.5	881.3	881.7	882.3
	882.9	883.6	884.6	885.4	886.2	886.8	887.7	888.6	890.3	893.5
	897.8	903.0	901.1	900.3	900.0					
0 21	877.8	880.2	878.7	876.0	879.8	882.5	883.8	884.0	884.0	884.0
	883.8	883.6	883.3	882.9	882.6	882.4	882.2	882.2	882.4	882.8
	883.3	883.9	884.7	885.5	886.2	886.8	887.7	888.6	890.3	893.6
	897.8	903.0	901.2	900.4	900.0					
0 22	877.8	880.1	878.5	~~875.0~~	879.8	882.4	883.7	884.0	884.1	884.0
	883.9	~~883.7~~	883.5	883.2	883.0	882.9	882.9	882.9	883.1	883.4
	883.7	884.1	884.8	~~885.6~~	886.3	886.9	887.7	888.7	890.3	893.6
	897.8	~~903.0~~	901.2	900.4	900.0					
0 23	877.8	879.8	878.4	875.0	879.7	882.4	883.7	884.0	884.1	884.1
	884.0	883.9	883.8	883.7	883.6	883.6	883.7	883.8	883.9	884.1
	884.3	884.6	885.1	885.8	886.4	887.0	887.8	888.7	890.4	893.6
	897.9	903.0	901.3	900.5	900.1					
0 24	877.8	879.5	878.2	875.0	879.6	882.4	883.7	884.1	884.2	884.2
	884.2	884.2	884.2	884.2	884.2	884.3	884.3	884.4	884.5	884.7
	884.9	885.1	885.5	886.1	886.6	887.1	887.9	888.8	890.4	893.6
	897.9	903.0	901.4	900.6	900.2					
0 25	877.7	879.2	877.9	875.0	879.5	882.3	883.7	884.1	884.3	884.4
	884.4	884.5	884.5	884.6	884.7	884.7	884.8	884.9	885.0	885.2
	885.3	885.5	885.9	886.3	886.8	887.3	888.0	888.8	890.5	893.7
	897.9	903.0	901.5	900.6	900.2					
0 26	877.6	879.0	877.8	875.0	879.4	882.3	883.8	884.2	884.4	884.5
	884.6	884.7	884.8	884.9	885.0	~~885.1~~	885.2	885.3	885.4	~~885.5~~
	885.7	885.8	886.2	886.6	887.0	887.4	888.1	888.9	890.5	893.7
	898.0	903.0	901.6	900.7	900.3					
0 27	877.5	878.6	877.5	875.0	879.3	882.2	883.8	884.3	884.6	884.8
	884.9	885.0	885.2	885.4	885.5	885.6	885.7	885.8	885.9	886.0
	886.1	886.3	886.5	886.9	887.3	887.7	888.3	889.1	890.6	893.7
	898.0	903.0	901.7	900.8	900.4					
0 28	877.4	878.1	877.1	875.0	879.2	882.2	883.9	884.5	884.8	885.0
	885.2	885.4	885.6	885.8	885.9	886.0	886.1	~~886.2~~	886.3	886.4
	886.5	886.7	886.9	887.3	887.6	888.0	888.5	889.3	890.7	893.8
	898.0	903.0	901.9	900.9	900.5					
0 29	877.0	877.3	876.5	875.0	879.0	882.1	884.0	884.8	885.2	885.5
	885.8	886.0	886.2	886.4	886.5	886.7	886.8	886.9	887.0	887.1
	887.2	887.3	887.6	887.9	888.2	888.5	888.9	889.6	890.9	893.9
	898.0	903.0	902.2	901.1	900.6					
0 30	875.9	875.9	875.2	874.0	878.7	882.2	884.4	885.4	885.9	886.2
	886.5	886.7	887.0	887.2	887.3	887.4	887.5	887.7	887.8	887.9
	888.0	888.1	888.3	888.6	888.9	889.1	889.6	890.1	891.3	893.8
	897.4	900.8	903.0	901.4	~~900.8~~					
0 31	874.6	874.4	874.0	875.9	879.2	882.4	884.8	885.8	886.3	886.7
	886.9	887.2	887.4	887.6	~~887.7~~	887.8	887.9	888.0	888.1	888.2
	~~888.3~~	888.5	888.7	888.9	889.2	889.4	889.8	890.3	891.3	893.6
	896.4	898.9	900.5	900.6	900.5					
0 32	~~873.3~~	873.2	873.0	876.1	879.4	882.6	884.9	885.9	886.4	886.8
	887.1	887.3	887.5	887.7	887.9	888.0	888.1	888.2	888.2	888.3
	888.4	888.6	888.8	889.0	889.2	889.5	889.8	890.3	891.2	893.3
	895.8	897.9	899.3	899.9	900.1					

constant head erroneously set at 800 instead of 880 should not affect model

0 33	872.2	871.9	871.0	875.7	879.4	882.7	885.0	886.0	886.5	886.9
	887.1	887.3	887.6	887.8	887.9	888.0	888.1	888.2	888.3	888.4
	888.4	888.6	888.8	889.0	889.2	889.4	889.8	890.2	891.1	893.0
	895.4	897.4	898.9	899.7	900.0					
0 34	871.3	871.1	871.0	875.7	879.4	882.7	885.0	886.0	886.5	886.9
	887.1	887.3	887.6	887.8	887.9	888.0	888.1	888.2	888.3	888.3
	888.4	888.6	888.7	889.0	889.2	889.4	889.7	890.2	891.1	892.9
	895.3	897.3	899.1	900.0	900.0					
0 35	870.7	870.0	872.5	876.0	879.5	882.7	885.1	886.0	886.5	886.9
	887.1	887.3	887.6	887.8	887.9	888.0	888.1	888.2	888.2	888.3
	888.4	888.5	888.7	889.0	889.2	889.4	889.7	890.2	891.0	892.9
	895.3	897.6	900.0	900.0	900.0					

1 DRAWDOWN IN LAYER 1 AT END OF TIME STEP 20 IN STRESS PERIOD 1

	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
	21	22	23	24	25	26	27	28	29	30
	31	32	33	34	35					
0 1	-11.06	-9.987	-8.374	-6.823	0.0000E+00	-6.866	-7.733	-8.136	-8.339	-8.492
	-8.594	-8.697	-8.800	-8.882	-8.934	-8.975	-9.016	-9.057	-9.098	-9.140
	-9.181	-9.232	-9.315	-9.417	-9.520	-9.623	-9.776	-9.979	-10.38	-11.26
	-12.32	-13.21	-13.90	-14.37	-14.60					
0 2	-12.11	-10.48	-8.253	-6.052	0.0000E+00	-6.560	-7.585	-8.031	-8.252	-8.417
	-8.527	-8.637	-8.747	-8.835	-8.890	-8.934	-8.978	-9.021	-9.065	-9.109
	-9.153	-9.207	-9.294	-9.403	-9.512	-9.620	-9.782	-9.997	-10.42	-11.35
	-12.47	-13.41	-14.12	-14.60	-14.83					
0 3	-14.68	-11.48	-7.988	0.0000E+00	-5.096	-6.404	-7.442	-7.910	-8.144	-8.320
	-8.438	-8.556	-8.674	-8.769	-8.828	-8.875	-8.923	-8.970	-9.018	-9.065
	-9.112	-9.172	-9.266	-9.385	-9.504	-9.622	-9.799	-10.04	-10.50	-11.53
	-12.77	-13.80	-14.57	-15.06	-15.30					
0 4	0.0000E+00	-12.51	-7.887	0.0000E+00	-4.942	-6.141	-7.202	-7.700	-7.952	-8.144
	-8.273	-8.402	-8.532	-8.637	-8.703	-8.755	-8.808	-8.861	-8.914	-8.967
	-9.020	-9.087	-9.193	-9.327	-9.461	-9.596	-9.798	-10.07	-10.61	-11.80
	-13.26	-14.44	-15.27	-15.76	-15.99					
0 5	-13.03	-9.805	-6.606	0.0000E+00	-4.500	-5.627	-6.745	-7.290	-7.569	-7.784
	-7.929	-8.076	-8.225	-8.345	-8.421	-8.482	-8.543	-8.605	-8.666	-8.728
	-8.790	-8.868	-8.993	-9.152	-9.311	-9.472	-9.714	-10.04	-10.69	-12.16
	-13.98	-15.41	-16.27	-16.72	-16.91					
0 6	-8.483	-6.645	-4.453	0.0000E+00	-3.395	-4.704	-5.925	-6.524	-6.834	-7.078
	-7.243	-7.413	-7.586	-7.728	-7.818	-7.890	-7.963	-8.037	-8.112	-8.187
	-8.262	-8.357	-8.512	-8.708	-8.908	-9.110	-9.418	-9.838	-10.68	-12.61
	-15.02	-16.89	-17.65	-17.91	-17.99					
0 7	-6.210	-4.335	-2.128	0.0000E+00	-1.828	-3.730	-4.980	-5.540	-5.832	-6.068
	-6.233	-6.406	-6.588	-6.743	-6.843	-6.924	-7.008	-7.093	-7.180	-7.269
	-7.360	-7.476	-7.666	-7.913	-8.169	-8.433	-8.837	-9.393	-10.51	-12.99
	-16.12	-18.76	-19.03	-18.93	-18.84					
0 8	-5.464	-3.300	-1.166	0.0000E+00	-1.237	-3.316	-4.534	-4.999	-5.232	-5.419
	-5.552	-5.698	-5.860	-6.006	-6.104	-6.187	-6.273	-6.363	-6.458	-6.556
	-6.658	-6.790	-7.012	-7.309	-7.620	-7.941	-8.432	-9.097	-10.40	-13.16
	-16.66	-19.94	-19.70	-19.37	-19.20					
0 9	-5.144	-2.764	-0.6694	0.0000E+00	-0.9376	-3.118	-4.319	-4.722	-4.910	-5.053
	-5.155	-5.269	-5.404	-5.535	-5.628	-5.707	-5.793	-5.886	-5.984	-6.090
	-6.201	-6.347	-6.596	-6.934	-7.290	-7.655	-8.208	-8.942	-10.35	-13.24
	-16.93	-20.62	-20.03	-19.59	-19.38					
0 10	-4.950	-2.349	-0.3017	0.0000E+00	-0.7235	-2.979	-4.172	-4.522	-4.664	-4.754
	-4.814	-4.883	-4.972	-5.073	-5.151	-5.223	-5.305	-5.398	-5.502	-5.616
	-5.740	-5.907	-6.196	-6.591	-7.002	-7.417	-8.034	-8.829	-10.32	-13.31
	-17.12	-21.20	-20.27	-19.74	-19.50					
0 11	-4.838	-2.064	-5.4810E-02	0.0000E+00	-0.5819	-2.890	-4.080	-4.396	-4.505	-4.552
	-4.577	-4.603	-4.644	-4.709	-4.769	-4.831	-4.907	-4.999	-5.108	-5.232
	-5.370	-5.559	-5.890	-6.340	-6.799	-7.256	-7.922	-8.760	-10.31	-13.35
	-17.24	-21.62	-20.43	-19.85	-19.58					
0 12	-4.744	-1.771	0.1943	0.0000E+00	-0.4405	-2.806	-3.997	-4.281	-4.357	-4.357
	-4.337	-4.304	-4.272	-4.274	-4.300	-4.340	-4.403	-4.492	-4.608	-4.750
	-4.915	-5.142	-5.542	-6.071	-6.595	-7.100	-7.820	-8.699	-10.29	-13.39
	-17.36	-22.08	-20.58	-19.94	-19.66					
0 13	-4.670	-1.467	0.4406	0.0000E+00	-0.3043	-2.726	-3.924	-4.182	-4.228	-4.179
	-4.110	-4.003	-3.862	-3.751	-3.706	-3.696	-3.725	-3.804	-3.936	-4.117
	-4.335	-4.639	-5.157	-5.799	-6.401	-6.959	-7.733	-8.651	-10.29	-13.43
	-17.47	-22.57	-20.73	-20.04	-19.74					
0 14	-4.627	-1.214	0.6360	0.0000E+00	-0.1985	-2.666	-3.873	-4.119	-4.147	-4.065
	-3.959	-3.786	-3.531	-3.260	-3.090	-2.978	-2.925	-2.970	-3.142	-3.411
	-3.734	-4.166	-4.846	-5.605	-6.274	-6.872	-7.683	-8.626	-10.29	-13.46
	-17.55	0.0000E+00	-20.84	-20.12	-19.80					
0 15	-4.608	-1.051	0.7579	0.0000E+00	-0.1333	-2.630	-3.846	-4.086	-4.107	-4.009
	-3.883	-3.675	-3.347	-2.949	-2.652	-2.413	-2.226	-2.200	-2.448	-2.853
	-3.307	-3.866	-4.673	-5.506	-6.213	-6.832	-7.661	-8.616	-10.29	-13.48
	-17.60	0.0000E+00	-20.91	-20.16	-19.84					
0 16	-4.595	-0.9181	0.8554	0.0000E+00	-8.1421E-02	-2.602	-3.825	-4.064	-4.081	-3.973
	-3.836	-3.604	-3.225	-2.724	-2.297	-1.898	-1.494	-1.288	-1.721	-2.346
	-2.961	-3.649	-4.560	-5.445	-6.176	-6.808	-7.649	-8.611	-10.30	-13.49
	-17.63	0.0000E+00	-20.96	-20.20	-19.87					
0 17	-4.587	-0.7822	0.9529	0.0000E+00	-2.9907E-02	-2.574	-3.807	-4.046	-4.061	-3.948
	-3.804	-3.557	-3.142	-2.555	-1.994	-1.375	-0.5408	0.3135	-0.7752	-1.832
	-2.665	-3.488	-4.484	-5.406	-6.153	-6.794	-7.642	-8.610	-10.30	-13.51
	-17.66	0.0000E+00	-21.01	-20.23	-19.90					
0 18	-4.583	-0.6432	1.049	0.0000E+00	2.0447E-02	-2.548	-3.790	-4.032	-4.048	-3.934
	-3.788	-3.536	-3.108	-2.486	6.150	-1.049	0.4389	4.145	0.1967	-1.511
	-2.526	-3.423	-4.456	-5.392	-6.145	-6.790	-7.642	-8.612	-10.31	-13.52
	-17.70	0.0000E+00	-21.06	-20.27	-19.93					
0 19	1.0000E+30	-0.5009	1.145	0.0000E+00	6.9641E-02	-2.523	-3.776	-4.023	-4.041	-3.931
	-3.788	-3.543	-3.130	5.456	-1.984	-1.366	-0.5316	0.3221	-0.7676	-1.825
	-2.660	-3.483	-4.481	-5.404	-6.153	-6.796	-7.647	-8.617	-10.32	-13.54
	-17.73	0.0000E+00	-21.10	-20.30	-19.96					
0 20	2.179	-0.3597	1.240	0.0000E+00	0.1178	-2.498	-3.763	-4.017	-4.041	-3.939
	-3.805	-3.577	-3.201	-2.702	-2.277	-1.879	-1.476	-1.271	-1.706	-2.333
	-2.949	-3.640	-4.553	-5.442	-6.176	-6.812	-7.657	-8.626	-10.33	-13.55
	-17.75	0.0000E+00	-21.15	-20.34	-19.98					
0 21	2.182	-0.2225	1.334	0.0000E+00	0.1650	-2.474	-3.753	-4.016	-4.048	-3.957
	-3.837	-3.633	-3.310	-2.917	-2.622	-2.384	-2.200	-2.175	-2.427	-2.834
	-3.290	-3.852	-4.663	-5.502	-6.213	-6.837	-7.674	-8.638	-10.34	-13.56
	-17.78	0.0000E+00	-21.19	-20.37	-20.01					
0 22	2.189	-5.5542E-02	1.450	0.0000E+00	0.2228	-2.446	-3.742	-4.019	-4.063	-3.992
	-3.893	-3.728	-3.479	-3.214	-3.047	-2.939	-2.888	-2.937	-3.111	-3.383
	-3.710	-4.145	-4.832	-5.598	-6.275	-6.880	-7.701	-8.657	-10.35	-13.58
	-17.81	0.0000E+00	-21.25	-20.41	-20.05					

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0 23    2.208      0.2011      1.631      0.0000E+00  0.3101     -2.403     -3.730     -4.036     -4.105     -4.072
       -4.014     -3.917      -3.787     -3.684      -3.644     -3.639     -3.673     -3.756     -3.892     -4.078
       -4.301     -4.609      -5.137     -5.789      -6.402     -6.970     -7.759     -8.697     -10.37     -13.61
       -17.86      0.0000E+00 -21.33     -20.48      -20.10
0 24    2.247      0.5009      1.847      0.0000E+00  0.4087     -2.355     -3.727     -4.077     -4.186     -4.208
       -4.204     -4.186      -4.168     -4.182      -4.216     -4.262     -4.331     -4.426     -4.548     -4.696
        3.133     -5.102      -5.514     -6.057      -6.595     -7.115     -7.856     -8.763     -10.41     -13.64
       -17.90      0.0000E+00 -21.43     -20.55      -20.16
0 25    2.297      0.7822      2.052      0.0000E+00  0.4979     -2.313     -3.734     -4.135     -4.285     -4.362
       -4.406     -4.451      -4.511     -4.592      -4.662     -4.731     -4.815     -4.915     -5.031     -5.163
       -5.309     -5.508      -5.854     -6.322      -6.800     -7.275     -7.968     -8.842     -10.46     -13.67
       -17.94      0.0000E+00 -21.52     -20.63      -20.22
0 26    2.359      1.047       2.248      0.0000E+00  0.5785     -2.276     -3.750     -4.205     -4.397     -4.523
       -4.607     -4.699      -4.812     -4.931      -5.021     -5.102     -5.194     -5.296     -5.409     -5.533
       -5.666     -5.844      -6.152     -6.569      -7.002     -7.440     -8.090     -8.928     -10.51     -13.70
       -17.97      0.0000E+00 -21.61     -20.70      -20.28
0 27    2.466      1.422       2.531      0.0000E+00  0.6878     -2.229     -3.785     -4.321     -4.572     -4.761
       -4.893     -5.038      -5.203     -5.357      -5.464     -5.555     -5.653     -5.757     -5.868     -5.984
       -6.107     -6.268      -6.540     -6.906      -7.290     -7.683     -8.277     -9.066     -10.58     -13.74
       -18.00      0.0000E+00 -21.74     -20.80      -20.36
0 28    2.638      1.869       2.875      0.0000E+00  0.8065     -2.184     -3.855     -4.490     -4.803     -5.049
       -5.221     -5.404      -5.604     -5.780      -5.897     -5.994     -6.095     -6.200     -6.309     -6.421
       -6.538     -6.688      -6.939     -7.271      -7.617     -7.974     -8.517     -9.252     -10.69     -13.79
       -18.01      0.0000E+00 -21.90     -20.92      -20.46
0 29    3.030      10.69       3.521      0.0000E+00  1.000      -2.129     -4.021     -4.823     -5.228      2.453
       -5.766     -5.992      -6.227     -6.423      -6.549     -6.651     -6.755     -6.860     -6.968     -7.077
       -7.188     -7.328      -7.558     -7.855      -8.160     -8.473     -8.949     -9.603     -10.91     -13.86
       -17.97      0.0000E+00 -22.21     -21.12      -20.63
0 30    4.069      4.143       4.790      0.0000E+00  1.258      -2.166     -4.407     -5.387     -5.874     -6.246
       -6.496     -6.747      -7.002     -7.208      -7.337     -7.441     -7.546     -7.650     -7.756     -7.862
       -7.968     -8.102      -8.316     -8.588      -8.862     -9.139     -9.557     -10.12     -11.26     -13.85
       -17.38     -20.81       0.0000E+00 -21.37     -20.82
0 31    5.424      5.584       0.0000E+00  4.113      0.8096     -2.425     -4.756     -5.772     -6.273     -6.650
       -6.901     -7.152      -7.404     -7.605      -7.731     -7.832     -7.933     -8.034     -8.135     -8.236
       -8.337     -8.464      -8.666     -8.919      -9.173     -9.427     -9.807     -10.32     -11.32     -13.56
       -16.45     -18.93      -20.47     -20.57      -20.51
0 32    6.677      6.835       0.0000E+00  3.928      0.6109     -2.603     -4.937     -5.945     -6.440     -6.810
       -7.056     -7.300      -7.544     -7.739      -7.861     -7.958     -8.055     -8.152     -8.249     -8.345
       -8.442     -8.562      -8.755     -8.995      -9.234     -9.473     -9.828     -10.30     -11.23     -13.26
       -15.76     -17.86      -19.29     -19.93      -20.15
0 33    7.824      8.137       0.0000E+00  4.318      0.6210     -2.674     -5.010     -6.008     -6.496     -6.859
       -7.100     -7.339      -7.577     -7.767      -7.886     -7.980     -8.074     -8.168     -8.262     -8.356
       -8.450     -8.566      -8.752     -8.984      -9.214     -9.444     -9.785     -10.24     -11.12     -13.03
       -15.38     -17.37      -18.86     -19.70       0.0000E+00
0 34    8.697      8.950       0.0000E+00  4.323      0.5901     -2.715     -5.040     -6.029     -6.512     -6.871
       -7.108     -7.344      -7.579     -7.766      -7.883     -7.976     -8.068     -8.161     -8.253     -8.345
       -8.437     -8.552      -8.735     -8.962      -9.188     -9.413     -9.747     -10.19     -11.06     -12.93
       -15.25     -17.33      -19.06      0.0000E+00 -20.00
0 35    9.340      0.0000E+00  7.538      3.985       0.4979     -2.750     -5.057     -6.039     -6.518     -6.875
       -7.111     -7.345      -7.579     -7.764      -7.880     -7.972     -8.064     -8.156     -8.248     -8.339
       -8.431     -8.545      -8.726     -8.952      -9.176     -9.399     -9.732     -10.17     -11.03     -12.90
       -15.28     -17.57       0.0000E+00 -20.00      -20.00
0

                     VOLUMETRIC BUDGET FOR ENTIRE MODEL AT END OF TIME STEP 20 IN STRESS PERIOD  1
                     -----------------------------------------------------------------------------
0           CUMULATIVE VOLUMES      L**3                                 RATES FOR THIS TIME STEP      L**3/T
            ------------------                                           ------------------------

                  IN:                                                          IN:
                  ---                                                          ---
                    STORAGE =    0.00000E+00                                    STORAGE =    0.00000E+00
              CONSTANT HEAD =     95905.                                  CONSTANT HEAD =    0.55500E-01
                      WELLS =    0.00000E+00                                      WELLS =    0.00000E+00
0                  TOTAL IN =     95905.                                       TOTAL IN =    0.55500E-01
0                OUT:                                                        OUT:
                 ----                                                        ----
                    STORAGE =    0.00000E+00                                    STORAGE =    0.00000E+00
              CONSTANT HEAD =     78625.                                  CONSTANT HEAD =    0.45501E-01
                      WELLS =     17280.                                          WELLS =    0.10000E-01
0                 TOTAL OUT =     95905.                                      TOTAL OUT =    0.55501E-01
0                  IN - OUT =  -0.62500E-01                                    IN - OUT =  -0.10431E-06
0      PERCENT DISCREPANCY =                 0.00               PERCENT DISCREPANCY =                    0.00


0

         TIME SUMMARY AT END OF TIME STEP 20 IN STRESS PERIOD  1
                                 SECONDS        MINUTES        HOURS          DAYS          YEARS
                             -----------------------------------------------------------------------
     TIME STEP LENGTH         86400.0        1440.00        24.0000        1.00000        0.273785E-02
   STRESS PERIOD TIME         0.172800E+07   28800.0        480.000        20.0000        0.547570E-01
 TOTAL SIMULATION TIME        0.172800E+07   28800.0        480.000        20.0000        0.547570E-01
1
```

NO WELL

7S/7D.2

```
1                       U.S. GEOLOGICAL SURVEY MODULAR FINITE-DIFFERENCE GROUND-WATER MODEL
0BONMOD2 1 layer, 35 rows, 35 columns, 0 well                                  unconfined, impermeable bedrock 7S/D
    1 LAYERS          35 ROWS          35 COLUMNS
   1 STRESS PERIOD(S) IN SIMULATION
 MODEL TIME UNIT IS SECONDS
0I/O UNITS:
 ELEMENT OF IUNIT:  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
         I/O UNIT: 11  0  0  0  0  0  0  0 19  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0BAS1 -- BASIC MODEL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT  1
 ARRAYS RHS AND BUFF WILL SHARE MEMORY.
 START HEAD WILL BE SAVED
     11099 ELEMENTS IN X ARRAY ARE USED BY BAS
     11099 ELEMENTS OF X ARRAY USED OUT OF    30000
0BCF1 -- BLOCK-CENTERED FLOW PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 11
 STEADY-STATE SIMULATION
         LAYER  AQUIFER TYPE
         -------------------
           1            1
       2451 ELEMENTS IN X ARRAY ARE USED BY BCF
     13550 ELEMENTS OF X ARRAY USED OUT OF    30000
0SIP1 -- STRONGLY IMPLICIT PROCEDURE SOLUTION PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 19
 MAXIMUM OF 100 ITERATIONS ALLOWED FOR CLOSURE
   5 ITERATION PARAMETERS
       5305 ELEMENTS IN X ARRAY ARE USED BY SIP
     18855 ELEMENTS OF X ARRAY USED OUT OF    30000
1BONMOD2 1 layer, 35 rows, 35 columns, 0 well                                  unconfined, impermeable bedrock 7S/D
0
```

BOUNDARY ARRAY FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35I2)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
0 1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 2	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 3	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 4	-1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 5	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 6	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 7	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 8	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 9	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 10	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 11	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 12	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 13	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 14	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 15	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 16	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 17	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 18	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 19	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 20	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 21	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 22	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 23	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 24	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 25	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 26	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 27	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 28	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 29	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1
0 30	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1
0 31	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 32	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 33	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1
0 34	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1
0 35	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1

```
0AQUIFER HEAD WILL BE SET TO  999.90     AT ALL NO-FLOW NODES (IBOUND=0).
0
```

INITIAL HEAD FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35F5.0)

	1 16 31	2 17 32	3 18 33	4 19 34	5 20 35	6 21	7 22	8 23	9 24	10 25	11 26	12 27	13 28	14 29	15 30
0 1	880.0	880.0	880.0	880.0	886.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 2	880.0	880.0	880.0	880.0	885.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 3	880.0	880.0	880.0	884.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 4	900.0	880.0	880.0	884.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 5	880.0	880.0	880.0	884.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 6	880.0	880.0	880.0	883.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 7	880.0	880.0	880.0	879.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 8	880.0	880.0	880.0	879.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 9	880.0	880.0	880.0	878.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 10	880.0	880.0	880.0	878.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 11	880.0	880.0	880.0	878.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 12	880.0	880.0	880.0	877.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 13	880.0	880.0	880.0	877.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 14	880.0	880.0	880.0	877.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 15	880.0	880.0	880.0	877.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 16	880.0	880.0	880.0	877.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 17	880.0	880.0	880.0	876.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 18	880.0	880.0	880.0	876.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 19	800.0	880.0	880.0	876.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 20	880.0	880.0	880.0	876.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 21	880.0	880.0	880.0	876.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 22	880.0	880.0	880.0	875.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 23	880.0	880.0	880.0	875.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 24	880.0	880.0	880.0	875.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	888.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 25	880.0	880.0	880.0	875.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 26	880.0	880.0	880.0	875.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 27	880.0	880.0	880.0	875.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 28	880.0	880.0	880.0	875.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 29	880.0	888.0	880.0	875.0	880.0	880.0	880.0	880.0	880.0	888.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	903.0	880.0	880.0	880.0										
0 30	880.0	880.0	880.0	874.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	903.0	880.0	880.0										
0 31	880.0	880.0	874.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 32	880.0	880.0	873.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 33	880.0	880.0	871.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	900.0										
0 34	880.0	880.0	871.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0

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       880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
       880.0   880.0   880.0   900.0   880.0
0 35   880.0   870.0   880.0   880.0   380.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
       880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
       880.0   880.0   900.0   880.0   880.0
0DEFAULT OUTPUT CONTROL -- THE FOLLOWING OUTPUT COMES AT THE END OF EACH STRESS PERIOD:
 TOTAL VOLUMETRIC BUDGET
          HEAD
          DRAWDOWN
0                                                   COLUMN TO ROW ANISOTROPY =   1.000000
0


                                                  DELR WILL BE READ ON UNIT 11 USING FORMAT:            (35F4.0)
                                  ------------------------------------------------------------------------------------

   60.000      60.000      60.000      60.000      60.000      60.000      30.000      10.000      10.000      5.0000
   5.0000      5.0000      5.0000      3.0000      2.0000      2.0000      2.0000      2.0000      2.0000      2.0000
   2.0000      3.0000      5.0000      5.0000      5.0000      5.0000      10.000      10.000      30.000      60.000
   60.000      60.000      60.000      60.000      60.000
0


                                                  DELC WILL BE READ ON UNIT 11 USING FORMAT:            (35F4.0)
                                  ------------------------------------------------------------------------------------

   60.000      60.000      60.000      60.000      60.000      60.000      30.000      10.000      10.000      5.0000
   5.0000      5.0000      5.0000      3.0000      2.0000      2.0000      2.0000      2.0000      2.0000      2.0000
   2.0000      3.0000      5.0000      5.0000      5.0000      5.0000      10.000      10.000      30.000      60.000
   60.000      60.000      60.000      60.000      60.000
0                                                        HYD. COND. ALONG ROWS =  0.2000000E-04 FOR LAYER  1
0                                                                   BOTTOM =    845.0000     FOR LAYER  1
0


                                                        SOLUTION BY THE STRONGLY IMPLICIT PROCEDURE
                                                        -------------------------------------------
0                                                 MAXIMUM ITERATIONS ALLOWED FOR CLOSURE =       100
                                                              ACCELERATION PARAMETER =      1.0000
                                                    HEAD CHANGE CRITERION FOR CLOSURE =    0.10000E-02
                                                    SIP HEAD CHANGE PRINTOUT INTERVAL =         1

0
    5 ITERATION PARAMETERS CALCULATED FROM SPECIFIED WSEED = 0.00100000 :

           0.0000000E+00  0.8221720E+00  0.9683772E+00  0.9943766E+00  0.9990000E+00
1                                                   STRESS PERIOD NO.   1, LENGTH =   1728000.
                                                   ---------------------------------------------

                                                   NUMBER OF TIME STEPS =    20

                                                    MULTIPLIER FOR DELT =     1.000

                                                 INITIAL TIME STEP SIZE =    86400.00
0**********NODE    1  19    1 (LAYER,ROW,COL) WENT DRY AT ITERATION =  1  TIME STEP =  1  STRESS PERIOD =  1
0
    27 ITERATIONS FOR TIME STEP    1 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
    21.27      (  1, 13, 32)   9.370      (  1, 32, 34)   8.310      (  1, 10, 35)   7.723      (  1,  1, 35)   6.602      (  1, 19, 15)
  -0.6480      (  1,  7,  7) -0.4474      (  1,  8,  8)  0.5128      (  1, 26,  9)  0.3787      (  1, 21,  7)  0.5575      (  1,  9,  9)
  -0.9694E-01  (  1, 29, 10) -0.7931E-01  (  1, 28, 12)  0.8340E-01  (  1, 16, 15)  0.1593      (  1, 16, 14)  0.1083      (  1, 23, 23)
   0.1502E-01  (  1, 30,  7) -0.1206E-01  (  1, 15, 14) -0.2682E-01  (  1, 16, 14) -0.2938E-01  (  1, 13, 12) -0.3162E-01  (  1, 25, 13)
  -0.5734E-02  (  1, 29, 17)  0.5776E-02  (  1, 25, 13)  0.5617E-02  (  1, 21, 19)  0.9989E-02  (  1, 22, 15)  0.8031E-02  (  1, 27, 23)
   0.1155E-02  (  1, 30,  9) -0.9723E-03  (  1, 24, 11)
0
     1 ITERATIONS FOR TIME STEP    2 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.2086E-03 (  1,  7, 29)
0
     1 ITERATIONS FOR TIME STEP    3 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.1560E-03 (  1,  8, 29)
0
     1 ITERATIONS FOR TIME STEP    4 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.1229E-03 (  1,  8, 29)
0
     1 ITERATIONS FOR TIME STEP    5 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
  -0.9982E-04 (  1, 17, 20)
0
     1 ITERATIONS FOR TIME STEP    6 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.8965E-04 (  1, 19, 19)
0
     1 ITERATIONS FOR TIME STEP    7 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.8219E-04 (  1, 19, 19)
0
     1 ITERATIONS FOR TIME STEP    8 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.7617E-04 (  1, 19, 18)
0
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     1 ITERATIONS FOR TIME STEP   9 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
  -0.7063E-04 (  1, 19, 18)
0
     1 ITERATIONS FOR TIME STEP  10 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.6588E-04 (  1, 19, 17)
0
     1 ITERATIONS FOR TIME STEP  11 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.6149E-04 (  1, 19, 17)
0
     1 ITERATIONS FOR TIME STEP  12 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.5739E-04 (  1, 19, 17)
0
     1 ITERATIONS FOR TIME STEP  13 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.5380E-04 (  1, 19, 16)
0
     1 ITERATIONS FOR TIME STEP  14 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.5041E-04 (  1, 19, 16)
0
     1 ITERATIONS FOR TIME STEP  15 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.4726E-04 (  1, 19, 16)
0
     1 ITERATIONS FOR TIME STEP  16 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.4431E-04 (  1, 19, 16)
0
     1 ITERATIONS FOR TIME STEP  17 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.4159E-04 (  1, 19, 16)
0
     1 ITERATIONS FOR TIME STEP  18 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.3913E-04 (  1, 19, 16)
0
     1 ITERATIONS FOR TIME STEP  19 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.3680E-04 (  1, 19, 16)
0
     1 ITERATIONS FOR TIME STEP  20 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.3470E-04 (  1, 19, 16)
0
1
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HEAD IN LAYER 1 AT END OF TIME STEP 20 IN STRESS PERIOD 1

	1 / 11 / 21 / 31	2 / 12 / 22 / 32	3 / 13 / 23 / 33	4 / 14 / 24 / 34	5 / 15 / 25 / 35	6 / 16 / 26	7 / 17 / 27	8 / 18 / 28	9 / 19 / 29	10 / 20 / 30
0 1	891.1	890.0	888.4	886.8	886.0	887.2	888.2	888.7	888.9	889.1
	889.2	889.3	889.5	889.5	889.6	889.6	889.7	889.7	889.8	889.8
	889.9	889.9	890.0	890.1	890.2	890.4	890.5	890.7	891.2	892.1
	893.1	894.0	894.7	895.1	895.3					
0 2	892.1	890.5	888.3	886.1	885.0	886.9	888.2	888.7	888.9	889.1
	889.2	889.3	889.5	889.6	889.6	889.7	889.7	889.8	889.8	889.9
	889.9	890.0	890.1	890.2	890.3	890.4	890.6	890.8	891.3	892.2
	893.3	894.2	894.9	895.3	895.6					
0 3	894.7	891.5	888.0	884.0	885.3	886.9	888.2	888.7	889.0	889.2
	889.3	889.4	889.5	889.6	889.7	889.8	889.8	889.9	889.9	890.0
	890.0	890.1	890.2	890.3	890.4	890.6	890.7	891.0	891.5	892.5
	893.7	894.6	895.3	895.8	896.0					
0 4	900.0	892.5	887.9	884.0	885.3	886.9	888.2	888.7	889.0	889.2
	889.4	889.5	889.6	889.8	889.8	889.9	889.9	890.0	890.0	890.1
	890.2	890.2	890.3	890.5	890.6	890.8	891.0	891.2	891.7	892.9
	894.2	895.3	896.0	896.4	896.6					
0 5	893.0	889.8	886.6	884.0	885.0	886.7	888.1	888.7	889.0	889.3
	889.4	889.6	889.7	889.9	889.9	890.0	890.1	890.1	890.2	890.2
	890.3	890.4	890.5	890.7	890.8	891.0	891.2	891.5	892.1	893.4
	895.0	896.2	897.0	897.3	897.5					
0 6	888.5	886.6	884.5	883.0	884.1	886.1	887.8	888.5	888.9	889.2
	889.4	889.6	889.7	889.9	890.0	890.1	890.1	890.2	890.3	890.4
	890.4	890.5	890.7	890.8	891.0	891.2	891.5	891.8	892.6	894.1
	896.1	897.6	898.2	898.4	898.5					
0 7	886.2	884.3	882.1	879.0	882.7	885.5	887.5	888.3	888.8	889.1
	889.3	889.5	889.7	889.9	890.0	890.0	890.1	890.2	890.3	890.4
	890.5	890.6	890.7	890.9	891.1	891.3	891.7	892.1	892.9	894.7
	897.1	899.3	899.5	899.3	899.2					

0 8	885.5	883.3	881.2	879.0	882.2	885.2	887.3	888.2	888.7	889.0
	889.2	889.4	889.7	889.8	889.9	890.0	890.1	890.2	890.3	890.4
	890.5	890.6	890.7	891.0	891.2	891.4	891.7	892.1	893.0	894.9
	897.6	900.3	900.0	899.7	899.6					
0 9	885.1	882.8	880.7	878.0	881.9	885.1	887.3	888.2	888.6	889.0
	889.2	889.4	889.6	889.8	889.9	890.0	890.1	890.2	890.3	890.4
	890.5	890.6	890.7	891.0	891.2	891.4	891.7	892.2	893.0	895.0
	897.9	900.9	900.3	899.9	899.7					
0 10	885.0	882.3	880.3	878.0	881.7	885.0	887.2	888.1	888.6	888.9
	889.2	889.4	889.6	889.8	889.9	890.0	890.1	890.2	890.3	890.4
	890.5	890.6	890.7	891.0	891.2	891.4	891.7	892.2	893.1	895.1
	898.0	901.4	900.6	900.1	899.8					
0 11	884.8	882.1	880.1	878.0	881.6	884.9	887.2	888.1	888.6	888.9
	889.2	889.4	889.6	889.8	889.9	890.0	890.1	890.2	890.3	890.4
	890.5	890.6	890.7	891.0	891.2	891.4	891.8	892.2	893.1	895.1
	898.2	901.8	900.7	900.1	899.9					
0 12	884.7	881.8	879.8	877.0	881.5	884.9	887.1	888.1	888.6	888.9
	889.1	889.4	889.6	889.8	889.9	890.0	890.1	890.2	890.3	890.4
	890.4	890.6	890.7	891.0	891.2	891.4	891.8	892.2	893.1	895.2
	898.3	902.2	900.8	900.2	900.0					
0 13	884.7	881.5	879.6	877.0	881.3	884.8	887.1	888.1	888.5	888.9
	889.1	889.4	889.6	889.8	889.9	890.0	890.1	890.2	890.3	890.3
	890.4	890.6	890.7	891.0	891.2	891.4	891.8	892.2	893.1	895.2
	898.4	902.6	901.0	900.3	900.0					
0 14	884.6	881.2	879.4	877.0	881.2	884.8	887.1	888.0	888.5	888.9
	889.1	889.3	889.6	889.8	889.9	890.0	890.1	890.2	890.3	890.3
	890.4	890.6	890.7	891.0	891.2	891.4	891.8	892.2	893.2	895.3
	898.4	903.0	901.1	900.4	900.1					
0 15	884.6	881.1	879.2	877.0	881.2	884.7	887.0	888.0	888.5	888.9
	889.1	889.3	889.6	889.8	889.9	890.0	890.1	890.2	890.2	890.3
	890.4	890.5	890.7	891.0	891.2	891.4	891.8	892.2	893.2	895.3
	898.5	903.0	901.1	900.4	900.1					
0 16	884.6	880.9	879.1	877.0	881.1	884.7	887.0	888.0	888.5	888.9
	889.1	889.3	889.6	889.8	889.9	890.0	890.1	890.1	890.2	890.3
	890.4	890.5	890.7	891.0	891.2	891.4	891.8	892.2	893.2	895.3
	898.5	903.0	901.2	900.5	900.2					
0 17	884.6	880.8	879.0	876.0	881.1	884.7	887.0	888.0	888.5	888.8
	889.1	889.3	889.6	889.7	889.9	890.0	890.1	890.1	890.2	890.3
	890.4	890.5	890.7	891.0	891.2	891.4	891.8	892.2	893.2	895.3
	898.5	903.0	901.2	900.5	900.2					
0 18	884.6	880.6	879.0	876.0	881.0	884.6	887.0	888.0	888.5	888.8
	889.1	889.3	889.6	889.7	889.9	890.0	890.0	890.1	890.2	890.3
	890.4	890.5	890.7	891.0	891.2	891.4	891.8	892.2	893.2	895.3
	898.6	903.0	901.3	900.5	900.2					
0 19	1.0000E+30	880.5	878.9	876.0	881.0	884.6	887.0	888.0	888.5	888.8
	889.1	889.3	889.5	889.7	889.9	889.9	890.0	890.1	890.2	890.3
	890.4	890.5	890.7	891.0	891.2	891.4	891.8	892.2	893.2	895.3
	898.6	903.0	901.3	900.6	900.2					
0 20	877.8	880.4	878.8	876.0	880.9	884.6	887.0	888.0	888.5	888.8
	889.1	889.3	889.5	889.7	889.8	889.9	890.0	890.1	890.2	890.3
	890.4	890.5	890.7	891.0	891.2	891.4	891.8	892.3	893.2	895.3
	898.6	903.0	901.3	900.6	900.3					
0 21	877.8	880.2	878.7	876.0	880.9	884.6	887.0	888.0	888.5	888.8
	889.1	889.3	889.5	889.7	889.8	889.9	890.0	890.1	890.2	890.3
	890.4	890.5	890.7	891.0	891.2	891.4	891.8	892.3	893.2	895.4
	898.6	903.0	901.4	900.6	900.3					
0 22	877.8	880.1	878.5	875.0	880.8	884.5	886.9	887.9	888.4	888.8
	889.0	889.3	889.5	889.7	889.8	889.9	890.0	890.1	890.2	890.3
	890.4	890.5	890.7	891.0	891.2	891.4	891.8	892.3	893.2	895.4
	898.7	903.0	901.4	900.7	900.3					
0 23	877.8	879.8	878.4	875.0	880.7	884.5	886.9	887.9	888.4	888.8
	889.0	889.3	889.5	889.7	889.8	889.9	890.0	890.1	890.2	890.3
	890.4	890.5	890.7	890.9	891.2	891.4	891.8	892.3	893.2	895.4
	898.7	903.0	901.5	900.7	900.4					
0 24	877.8	879.5	878.2	875.0	880.7	884.4	886.9	887.9	888.4	888.8
	889.0	889.3	889.5	889.7	889.8	889.9	890.0	890.1	890.2	890.3
	890.4	890.5	890.7	890.9	891.2	891.4	891.8	892.3	893.2	895.4
	898.7	903.0	901.6	900.8	900.4					
0 25	877.7	879.2	877.9	875.0	880.6	884.4	886.8	887.9	888.4	888.7
	889.0	889.2	889.5	889.7	889.8	889.9	890.0	890.1	890.2	890.3
	890.4	890.5	890.7	890.9	891.2	891.4	891.8	892.3	893.2	895.4
	898.8	903.0	901.7	900.8	900.5					
0 26	877.6	879.0	877.8	875.0	880.5	884.3	886.8	887.8	888.3	888.7
	889.0	889.2	889.5	889.7	889.8	889.9	890.0	890.1	890.2	890.3
	890.4	890.5	890.7	890.9	891.2	891.4	891.8	892.3	893.2	895.4
	898.8	903.0	901.7	900.9	900.5					
0 27	877.5	878.6	877.5	875.0	880.4	884.3	886.8	887.8	888.3	888.7
	888.9	889.2	889.4	889.6	889.8	889.9	890.0	890.1	890.2	890.3
	890.3	890.5	890.7	890.9	891.2	891.4	891.8	892.2	893.2	895.4
	898.8	903.0	901.9	901.0	900.6					
0 28	877.4	878.1	877.1	875.0	880.2	884.2	886.7	887.8	888.3	888.6
	888.9	889.2	889.4	889.6	889.7	889.8	889.9	890.0	890.1	890.2
	890.3	890.4	890.6	890.9	891.1	891.4	891.7	892.2	893.2	895.4
	898.8	903.0	902.0	901.1	900.7					
0 29	877.0	877.3	876.5	875.0	880.0	884.0	886.6	887.7	888.2	888.6
	888.8	889.1	889.3	889.5	889.7	889.8	889.9	890.0	890.1	890.2
	890.3	890.4	890.6	890.8	891.1	891.3	891.7	892.2	893.2	895.4
	898.7	903.0	902.3	901.3	900.8					
0 30	875.9	875.9	875.2	874.0	879.6	883.7	886.3	887.4	888.0	888.4
	888.6	888.9	889.1	889.3	889.5	889.6	889.7	889.8	889.9	890.0
	890.1	890.2	890.4	890.6	890.9	891.1	891.5	892.0	893.0	895.1
	898.1	901.0	903.0	901.5	901.0					
0 31	874.6	874.4	874.0	876.2	880.0	883.6	886.1	887.2	887.7	888.1
	888.4	888.6	888.9	889.1	889.2	889.3	889.4	889.5	889.6	889.7
	889.8	889.9	890.1	890.3	890.6	890.8	891.2	891.6	892.6	894.6
	897.1	899.3	900.6	900.7	900.6					
0 32	873.3	873.2	873.0	876.4	880.1	883.5	886.0	887.0	887.5	887.9
	888.1	888.4	888.6	888.8	888.9	889.0	889.1	889.2	889.3	889.4
	889.5	889.6	889.8	890.0	890.3	890.5	890.8	891.3	892.2	894.1
	896.3	898.2	899.5	900.0	900.2					
0 33	872.2	871.9	871.0	876.0	880.0	883.4	885.8	886.8	887.3	887.7
	887.9	888.2	888.4	888.6	888.7	888.8	888.9	889.0	889.1	889.2
	889.3	889.4	889.6	889.8	890.0	890.3	890.6	891.0	891.9	893.7
	895.9	897.7	899.0	899.8	900.0					
0 34	871.3	871.1	871.0	876.0	879.9	883.4	885.7	886.7	887.2	887.6
	887.8	888.0	888.3	888.5	888.6	888.7	888.8	888.9	889.0	889.0
	889.1	889.2	889.4	889.6	889.9	890.1	890.4	890.8	891.7	893.5
	895.7	897.6	899.2	900.0	900.0					

0 35	870.7	870.0	872.6	876.3	880.0	883.3	885.7	886.7	887.2	887.5
	887.8	888.0	888.2	888.4	888.5	888.6	888.7	888.8	888.9	889.0
	889.1	889.2	889.4	889.6	889.8	890.0	890.3	890.8	891.6	893.4
	895.6	897.8	900.0	900.0	900.0					

1 DRAWDOWN IN LAYER 1 AT END OF TIME STEP 20 IN STRESS PERIOD 1

	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
	21	22	23	24	25	26	27	28	29	30
	31	32	33	34	35					
0 1	-11.06	-9.987	-8.374	-6.823	0.0000E+00	-7.181	-8.229	-8.699	-8.932	-9.107
	-9.223	-9.339	-9.454	-9.546	-9.604	-9.649	-9.695	-9.741	-9.786	-9.832
	-9.877	-9.934	-10.02	-10.14	-10.25	-10.36	-10.52	-10.74	-11.17	-12.08
	-13.15	-14.02	-14.68	-15.12	-15.34					
0 2	-12.11	-10.48	-8.253	-6.052	0.0000E+00	-6.936	-8.151	-8.664	-8.916	-9.102
	-9.226	-9.348	-9.470	-9.568	-9.628	-9.676	-9.724	-9.772	-9.820	-9.868
	-9.915	-9.975	-10.07	-10.19	-10.30	-10.42	-10.59	-10.82	-11.26	-12.21
	-13.32	-14.22	-14.90	-15.34	-15.56					
0 3	-14.68	-11.48	-7.988	0.0000E+00	-5.334	-6.946	-8.165	-8.697	-8.960	-9.156
	-9.286	-9.416	-9.545	-9.647	-9.711	-9.763	-9.814	-9.865	-9.915	-9.966
	-10.02	-10.08	-10.18	-10.31	-10.43	-10.55	-10.74	-10.98	-11.46	-12.48
	-13.67	-14.63	-15.33	-15.78	-16.00					
0 4	0.0000E+00	-12.51	-7.887	0.0000E+00	-5.333	-6.895	-8.164	-8.731	-9.013	-9.224
	-9.365	-9.505	-9.645	-9.757	-9.826	-9.882	-9.938	-9.994	-10.05	-10.10
	-10.16	-10.23	-10.34	-10.48	-10.61	-10.75	-10.95	-11.22	-11.75	-12.88
	-14.22	-15.27	-16.01	-16.45	-16.65					
0 5	-13.03	-9.805	-6.606	0.0000E+00	-5.049	-6.669	-8.067	-8.700	-9.015	-9.252
	-9.410	-9.568	-9.726	-9.852	-9.931	-9.994	-10.06	-10.12	-10.18	-10.25
	-10.31	-10.39	-10.51	-10.67	-10.82	-10.98	-11.21	-11.52	-12.12	-13.44
	-15.00	-16.22	-16.95	-17.33	-17.49					
0 6	-8.483	-6.645	-4.453	0.0000E+00	-4.139	-6.140	-7.804	-8.547	-8.916	-9.193
	-9.377	-9.561	-9.745	-9.892	-9.984	-10.06	-10.13	-10.20	-10.28	-10.35
	-10.42	-10.52	-10.66	-10.84	-11.03	-11.21	-11.48	-11.84	-12.55	-14.12
	-16.07	-17.60	-18.22	-18.42	-18.47					
0 7	-6.210	-4.335	-2.128	0.0000E+00	-2.734	-5.517	-7.487	-8.340	-8.759	-9.073
	-9.281	-9.489	-9.696	-9.862	-9.965	-10.05	-10.13	-10.21	-10.30	-10.38
	-10.46	-10.56	-10.73	-10.93	-11.14	-11.34	-11.65	-12.06	-12.87	-14.69
	-17.13	-19.28	-19.46	-19.33	-19.24					
0 8	-5.464	-3.300	-1.166	0.0000E+00	-2.203	-5.239	-7.338	-8.237	-8.678	-9.007
	-9.226	-9.443	-9.661	-9.834	-9.943	-10.03	-10.12	-10.20	-10.29	-10.37
	-10.46	-10.57	-10.74	-10.96	-11.17	-11.39	-11.71	-12.14	-12.99	-14.92
	-17.63	-20.32	-20.05	-19.73	-19.56					
0 9	-5.144	-2.764	-0.6694	0.0000E+00	-1.930	-5.101	-7.263	-8.184	-8.635	-8.972
	-9.196	-9.419	-9.641	-9.818	-9.929	-10.02	-10.11	-10.19	-10.28	-10.37
	-10.46	-10.57	-10.74	-10.96	-11.18	-11.40	-11.73	-12.17	-13.04	-15.03
	-17.87	-20.92	-20.34	-19.92	-19.72					
0 10	-4.950	-2.349	-0.3017	0.0000E+00	-1.733	-4.999	-7.206	-8.144	-8.603	-8.945
	-9.172	-9.398	-9.624	-9.804	-9.916	-10.01	-10.10	-10.19	-10.27	-10.36
	-10.45	-10.57	-10.74	-10.97	-11.19	-11.41	-11.75	-12.19	-13.08	-15.10
	-18.05	-21.43	-20.56	-20.06	-19.83					
0 11	-4.838	-2.064	-5.4810E-02	0.0000E+00	-1.602	-4.932	-7.169	-8.117	-8.581	-8.927
	-9.156	-9.384	-9.612	-9.794	-9.908	-9.998	-10.09	-10.18	-10.27	-10.36
	-10.45	-10.56	-10.74	-10.97	-11.19	-11.42	-11.76	-12.21	-13.10	-15.15
	-18.16	-21.80	-20.70	-20.15	-19.90					
0 12	-4.744	-1.771	0.1943	0.0000E+00	-1.470	-4.866	-7.131	-8.090	-8.558	-8.908
	-9.139	-9.370	-9.600	-9.784	-9.898	-9.990	-10.08	-10.17	-10.26	-10.35
	-10.45	-10.56	-10.74	-10.97	-11.20	-11.42	-11.76	-12.22	-13.12	-15.19
	-18.26	-22.20	-20.83	-20.24	-19.97					
0 13	-4.670	-1.467	0.4406	0.0000E+00	-1.342	-4.801	-7.094	-8.062	-8.536	-8.889
	-9.122	-9.355	-9.587	-9.772	-9.888	-9.980	-10.07	-10.16	-10.26	-10.35
	-10.44	-10.56	-10.74	-10.97	-11.20	-11.43	-11.77	-12.23	-13.14	-15.23
	-18.36	-22.63	-20.96	-20.32	-20.04					
0 14	-4.627	-1.214	0.6360	0.0000E+00	-1.242	-4.750	-7.065	-8.041	-8.518	-8.873
	-9.108	-9.343	-9.576	-9.763	-9.879	-9.972	-10.07	-10.16	-10.25	-10.34
	-10.44	-10.55	-10.74	-10.97	-11.20	-11.43	-11.77	-12.24	-13.15	-15.26
	-18.43	0.0000E+00	-21.06	-20.39	-20.10					
0 15	-4.608	-1.051	0.7579	0.0000E+00	-1.180	-4.719	-7.046	-8.027	-8.506	-8.863
	-9.100	-9.335	-9.570	-9.757	-9.874	-9.967	-10.06	-10.15	-10.25	-10.34
	-10.43	-10.55	-10.73	-10.97	-11.20	-11.43	-11.78	-12.24	-13.16	-15.28
	-18.47	0.0000E+00	-21.12	-20.43	-20.13					
0 16	-4.595	-0.9181	0.8554	0.0000E+00	-1.131	-4.694	-7.032	-8.016	-8.497	-8.855
	-9.092	-9.329	-9.564	-9.752	-9.869	-9.963	-10.06	-10.15	-10.24	-10.34
	-10.43	-10.55	-10.73	-10.96	-11.20	-11.43	-11.78	-12.24	-13.17	-15.29
	-18.50	0.0000E+00	-21.16	-20.46	-20.15					
0 17	-4.587	-0.7822	0.9529	0.0000E+00	-1.081	-4.669	-7.017	-8.005	-8.488	-8.847
	-9.085	-9.322	-9.558	-9.747	-9.865	-9.958	-10.05	-10.15	-10.24	-10.33
	-10.43	-10.54	-10.73	-10.96	-11.20	-11.43	-11.78	-12.24	-13.17	-15.30
	-18.53	0.0000E+00	-21.21	-20.49	-20.18					
0 18	-4.583	-0.6432	1.049	0.0000E+00	-1.033	-4.644	-7.003	-7.994	-8.479	-8.839
	-9.078	-9.316	-9.553	-9.742	-1.860	-9.954	-10.05	-10.14	-10.24	-10.33
	-10.42	-10.54	-10.73	-10.96	-11.20	-11.43	-11.78	-12.25	-13.18	-15.32
	-18.56	0.0000E+00	-21.25	-20.52	-20.21					
0 19	1.0000E+30	-0.5009	1.145	0.0000E+00	-0.9852	-4.620	-6.988	-7.983	-8.469	-8.831
	-9.071	-9.309	-9.547	-1.737	-9.855	-9.949	-10.04	-10.14	-10.23	-10.33
	-10.42	-10.54	-10.73	-10.96	-11.19	-11.43	-11.78	-12.25	-13.18	-15.33
	-18.58	0.0000E+00	-21.29	-20.56	-20.23					
0 20	2.179	-0.3597	1.240	0.0000E+00	-0.9384	-4.596	-6.974	-7.973	-8.460	-8.823
	-9.063	-9.302	-9.541	-9.731	-9.850	-9.945	-10.04	-10.13	-10.23	-10.32
	-10.42	-10.53	-10.72	-10.96	-11.19	-11.43	-11.78	-12.25	-13.19	-15.34
	-18.61	0.0000E+00	-21.33	-20.59	-20.26					
0 21	2.182	-0.2225	1.334	0.0000E+00	-0.8925	-4.572	-6.960	-7.962	-8.451	-8.815
	-9.056	-9.296	-9.535	-9.726	-9.845	-9.940	-10.03	-10.13	-10.22	-10.32
	-10.41	-10.53	-10.72	-10.96	-11.19	-11.43	-11.78	-12.25	-13.19	-15.35
	-18.63	0.0000E+00	-21.37	-20.62	-20.28					
0 22	2.189	-5.5542E-02	1.450	0.0000E+00	-0.8358	-4.543	-6.942	-7.948	-8.439	-8.805
	-9.046	-9.287	-9.527	-9.719	-9.838	-9.934	-10.03	-10.12	-10.22	-10.31
	-10.41	-10.53	-10.72	-10.95	-11.19	-11.43	-11.78	-12.25	-13.20	-15.36
	-18.66	0.0000E+00	-21.42	-20.65	-20.31					
0 23	2.208	0.2011	1.631	0.0000E+00	-0.7498	-4.497	-6.914	-7.926	-8.420	-8.788
	-9.031	-9.273	-9.515	-9.707	-9.827	-9.923	-10.02	-10.11	-10.21	-10.31
	-10.40	-10.52	-10.71	-10.95	-11.19	-11.42	-11.78	-12.26	-13.20	-15.38
	-18.69	0.0000E+00	-21.50	-20.71	-20.36					
0 24	2.247	0.5009	1.847	0.0000E+00	-0.6512	-4.441	-6.879	-7.899	-8.397	-8.767
	-9.012	-9.256	-9.499	-9.693	-9.813	-9.910	-10.01	-10.10	-10.20	-10.29
	-2.391	-10.51	-10.70	-10.94	-11.18	-11.42	-11.78	-12.26	-13.21	-15.40
	-18.73	0.0000E+00	-21.58	-20.78	-20.41					

0 25	2.297	0.7822	2.052	0.0000E+00	-0.5606	-4.387	-6.845	-7.873	-8.373	-8.746
	-8.992	-9.238	-9.482	-9.677	-9.799	-9.896	-9.993	-10.09	-10.19	-10.28
	-10.38	-10.50	-10.69	-10.93	-11.17	-11.41	-11.77	-12.26	-13.21	-15.41
	-18.76	0.0000E+00	-21.67	-20.84	-20.46					
0 26	2.359	1.047	2.248	0.0000E+00	-0.4771	-4.335	-6.811	-7.846	-8.350	-8.725
	-8.973	-9.219	-9.465	-9.661	-9.783	-9.881	-9.978	-10.08	-10.17	-10.27
	-10.37	-10.49	-10.68	-10.92	-11.17	-11.41	-11.77	-12.25	-13.22	-15.43
	-18.78	0.0000E+00	-21.74	-20.90	-20.51					
0 27	2.466	1.422	2.531	0.0000E+00	-0.3616	-4.260	-6.762	-7.806	-8.315	-8.692
	-8.942	-9.191	-9.439	-9.636	-9.759	-9.858	-9.956	-10.05	-10.15	-10.25
	-10.35	-10.47	-10.66	-10.91	-11.15	-11.40	-11.76	-12.25	-13.21	-15.44
	-18.80	0.0000E+00	-21.86	-20.99	-20.58					
0 28	2.638	1.869	2.875	0.0000E+00	-0.2299	-4.168	-6.699	-7.754	-8.267	-8.649
	-8.901	-9.152	-9.402	-9.601	-9.725	-9.825	-9.924	-10.02	-10.12	-10.22
	-10.32	-10.44	-10.64	-10.88	-11.13	-11.37	-11.74	-12.23	-13.20	-15.43
	-18.79	0.0000E+00	-22.00	-21.10	-20.67					
0 29	3.030	10.69	3.521	0.0000E+00	-1.7090E-03	-3.999	-6.578	-7.651	-8.173	-0.5607
	-8.817	-9.072	-9.325	-9.527	-9.653	-9.754	-9.854	-9.954	-10.05	-10.15
	-10.25	-10.38	-10.58	-10.83	-11.07	-11.32	-11.69	-12.19	-13.17	-15.40
	-18.72	0.0000E+00	-22.28	-21.28	-20.81					
0 30	4.069	4.143	4.790	0.0000E+00	0.3636	-3.717	-6.345	-7.437	-7.967	-8.360
	-8.620	-8.878	-9.135	-9.339	-9.466	-9.568	-9.669	-9.771	-9.871	-9.972
	-10.07	-10.20	-10.40	-10.65	-10.90	-11.14	-11.51	-12.01	-12.98	-15.14
	-18.10	-21.05	0.0000E+00	-21.47	-20.96					
0 31	5.424	5.584	0.0000E+00	3.809	2.4963E-02	-3.615	-6.144	-7.209	-7.727	-8.112
	-8.366	-8.618	-8.869	-9.068	-9.192	-9.291	-9.390	-9.489	-9.587	-9.685
	-9.783	-9.905	-10.10	-10.34	-10.58	-10.82	-11.18	-11.65	-12.57	-14.58
	-17.10	-19.27	-20.64	-20.70	-20.63					
0 32	6.677	6.835	0.0000E+00	3.586	-5.8960E-02	-3.531	-5.977	-7.010	-7.513	-7.886
	-8.133	-8.377	-8.620	-8.813	-8.934	-9.029	-9.125	-9.220	-9.315	-9.410
	-9.505	-9.623	-9.810	-10.04	-10.27	-10.50	-10.85	-11.30	-12.17	-14.06
	-16.33	-18.21	-19.49	-20.05	-20.23					
0 33	7.824	8.137	0.0000E+00	3.994	4.7852E-02	-3.426	-5.831	-6.843	-7.336	-7.700
	-7.941	-8.180	-8.417	-8.606	-8.723	-8.817	-8.910	-9.003	-9.096	-9.188
	-9.280	-9.395	-9.577	-9.804	-10.03	-10.25	-10.58	-11.02	-11.87	-13.69
	-15.86	-17.69	-19.03	-19.77	0.0000E+00					
0 34	8.697	8.950	0.0000E+00	4.019	8.2886E-02	-3.358	-5.732	-6.730	-7.216	-7.575
	-7.813	-8.048	-8.282	-8.468	-8.583	-8.675	-8.767	-8.859	-8.950	-9.041
	-9.132	-9.245	-9.425	-9.648	-9.870	-10.09	-10.42	-10.85	-11.69	-13.48
	-15.67	-17.59	-19.16	0.0000E+00	-20.00					
0 35	9.340	0.0000E+00	7.420	3.672	1.9409E-02	-3.342	-5.689	-6.678	-7.159	-7.516
	-7.752	-7.985	-8.217	-8.402	-8.517	-8.608	-8.700	-8.790	-8.881	-8.972
	-9.062	-9.174	-9.353	-9.575	-9.796	-10.01	-10.34	-10.77	-11.61	-13.41
	-15.65	-17.78	0.0000E+00	-20.00	-20.00					

0

VOLUMETRIC BUDGET FOR ENTIRE MODEL AT END OF TIME STEP 20 IN STRESS PERIOD 1

	CUMULATIVE VOLUMES	L**3	RATES FOR THIS TIME STEP	L**3/T
0	IN:		IN:	
	STORAGE =	0.00000E+00	STORAGE =	0.00000E+00
	CONSTANT HEAD =	88919.	CONSTANT HEAD =	0.51457E-01
0	TOTAL IN =	88919.	TOTAL IN =	0.51457E-01
0	OUT:		OUT:	
	STORAGE =	0.00000E+00	STORAGE =	0.00000E+00
	CONSTANT HEAD =	88919.	CONSTANT HEAD =	0.51459E-01
0	TOTAL OUT =	88919.	TOTAL OUT =	0.51459E-01
0	IN - OUT =	0.20313	IN - OUT =	-0.18030E-05
0	PERCENT DISCREPANCY =	0.00	PERCENT DISCREPANCY =	0.00

0

TIME SUMMARY AT END OF TIME STEP 20 IN STRESS PERIOD 1

	SECONDS	MINUTES	HOURS	DAYS	YEARS
TIME STEP LENGTH	86400.0	1440.00	24.0000	1.00000	0.273785E-02
STRESS PERIOD TIME	0.172800E+07	28800.0	480.000	20.0000	0.547570E-01
TOTAL SIMULATION TIME	0.172800E+07	28800.0	480.000	20.0000	0.547570E-01

1

TIME	SUMMARY OF ACTIVITIES
5:00 pm	Masterclean and crew of three are on-site for removal of 8 sections of TSI and two sections of floor tile and mastic. TSI is located in different areas throughout the 2nd, 3rd, and 4th floors. Location of floor tile is on third and fourth floors.
5:15: pm	Masterclean begins to prepare fourth floor for removal of limited floor tile and mastic which contain levels of asbestos. A two foot polyethelene splash guard will be placed on the surrounding floor and walls to prevent any contamination.
6:15 pm	EMCON observes that Masterclean has prepared area where floor tile is present. Location of floor tile on fourth and third floors is just East of elevator corridor in pre-existing south room. Masterclean has set up negative air machine directly by removal area. Negative air machine exhaust will be vented through window and outside of the building. Workers are instructed to wear tyvek suits with half-face respiratory protection throughout removal. Masterclean intends to use a petroleum based mastic remover during shift. Masterclean notifies EMCON that glove-bagging of selected asbestos containing insulation will be done after removal of floor tile and mastic on the fourth and third floors.
8:50 pm	EMCON observes Masterclean removing mastic from fourth floor area. Workers are wearing half-face respiratory protection. Masterclean will double bag material and load out through front door due to ground floor area being secured and locked up.
10:30 pm	Masterclean requests visual inspection of fourth floor floor-tile and mastic removal area. EMCON finds the area visually acceptable and directs Masterclean to encapsulate area.
11:45 pm	EMCON observes workers using correct negative pressure glove-bagging techniques for removal of insulation.
12:00 am	EMCON is notified that insulation sections have been glove-bagged and removed. EMCON inspects abatement of areas and finds very satisfactory.
1:00 am	EMCON does visual inspection of third floor area where mastic and floor tile was removed. Area is cleared and Masterclean begins to encapsulate. EMCON instructs Masterclean to leave two windows open on each floor to vent out mastic remover odor.
2:00 am	EMCON has inspected work areas and gives clearance. Masterclean demobilized and is off-site.
2:15 am	EMCON off site.

ASBESTOS REMOVAL DAILY REPORT

Location: GA Baptist Medical Center	Barriers/Warnings Posted: Asbestos		Client: Georgia Baptist Medical Center
Date: 2/17/93			Project: Nurses Dorm
Abat. Cont.: Masterclean			Project No. 2200.020.93
Abat.Super.: Louis Little	SAMPLES TAKEN		Technician: John Whitesides
# of Crews: 1(3)	Person.	thru NONE	
Bldg.: Nurses Dorm	Area	thru	
Units: Floors 2-4	Final	thru	EMCON
Weather:	Bulk	thru	SOUTHEAST
Type of Abat.: Limited TSI and floor tile/mastic removal	Other		

MODFLOW Simulation and Actual Head Comparisons including Simulated Discharge Drawdowns
near 29S and 29D (proposed CAP well RW-4)
K=4.8x10e-4 Q=1.75gpm
b= 32 to 36 feet

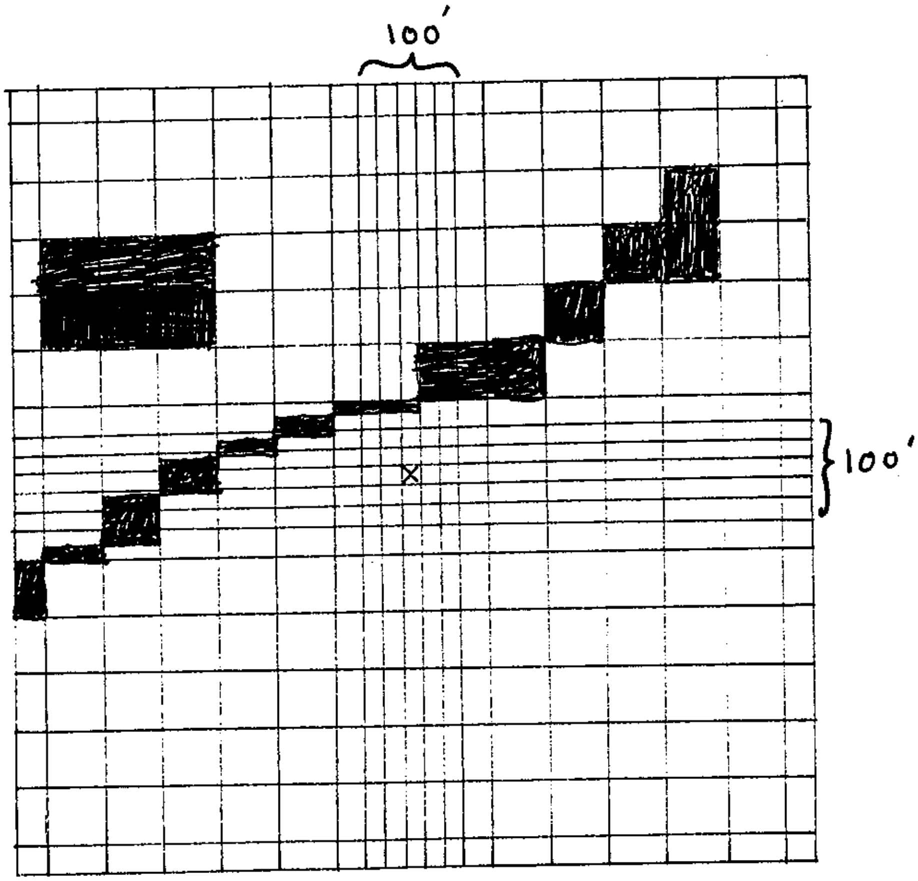
CELL NUMBER	ACTUAL HEAD	SIMULATED STEADY-STATE HEAD	HEAD DIFFERENCE	SIMULATED PUMPING HEAD	SIMULATED DRAWDOWN	RADIAL DISTANCE	CONSTANT HEAD CELL
1,1	900.8	902.8	2	902.8	0	560	NO
1,35	912.8	903.3	-9.5	903.3	0	560	NO
5,5	902	902.2	0.2	902.2	0	240	NO
3,31	901	901	0	901	0	240	YES
8,8	901	901	0	900	-1	65	NO
8,28	902	901	-1	899.3	-1.7	65	NO
10,10	901.5	901	-0.5	898.4	-2.6	38	NO
10,26	902.2	901	-1.2	898	-3	38	NO
14,14	902.2	901	-1.2	894.6	-6.4	12	NO
14,22	902.2	901	-1.2	894.5	-6.5	12	NO
18,18	902.2	901	-1.2	880.2	-20.8	0	NO
22,14	902.3	900.9	-1.4	894.2	-6.7	12	NO
22,22	902.4	901	-1.4	894.1	-6.9	12	NO
26,10	902.2	900.9	-1.3	897.1	-3.8	38	NO
26,26	902.4	901	-1.4	897	-4	38	NO
28,8	902	900.8	-1.2	898.1	-2.7	65	NO
28,28	902.8	901	-1.8	897.9	-3.1	65	NO
31,5	900.8	900.5	-0.3	899.5	-1	240	NO
31,31	904.6	901.2	-3.4	899.7	-1.5	240	NO
35,1	889	900.4	11.4	899.7	-0.7	560	NO
35,35	910.8	901.3	-9.5	900	-1.3	560	NO

NOTES:

1. Cell Number - row then column for (i,)j notation.
2. Actual Head - interpolated from 8/21/91 water table map at block centered (i,j) location.
3. Simulated Steady-State Head - MODFLOW Simulated Head without discharge stress from pumping well.
4. Head Difference - MODFLOW Simulated Steady-State Head minus Actual Head.
5. Simulated Pumping Head - MODFLOW Simulated Head with discharge stress from pumping well located at (i,j)=(19,19).
6. Simulated Drawdown - MODFLOW Simulated Pumping Head minus MODFLOW Simulated Steady-State Head.
7. Radial Distance - (i,j) block centered distance from discharge (i,j) cell.
8. Constant Head Cell - cell that corresponds to known hydrogeologic constant head boundaries such as a stream or creek.
9. Estimated Recovery Head - Actual Head minus Simulated Drawdown.

Near 29S/29D

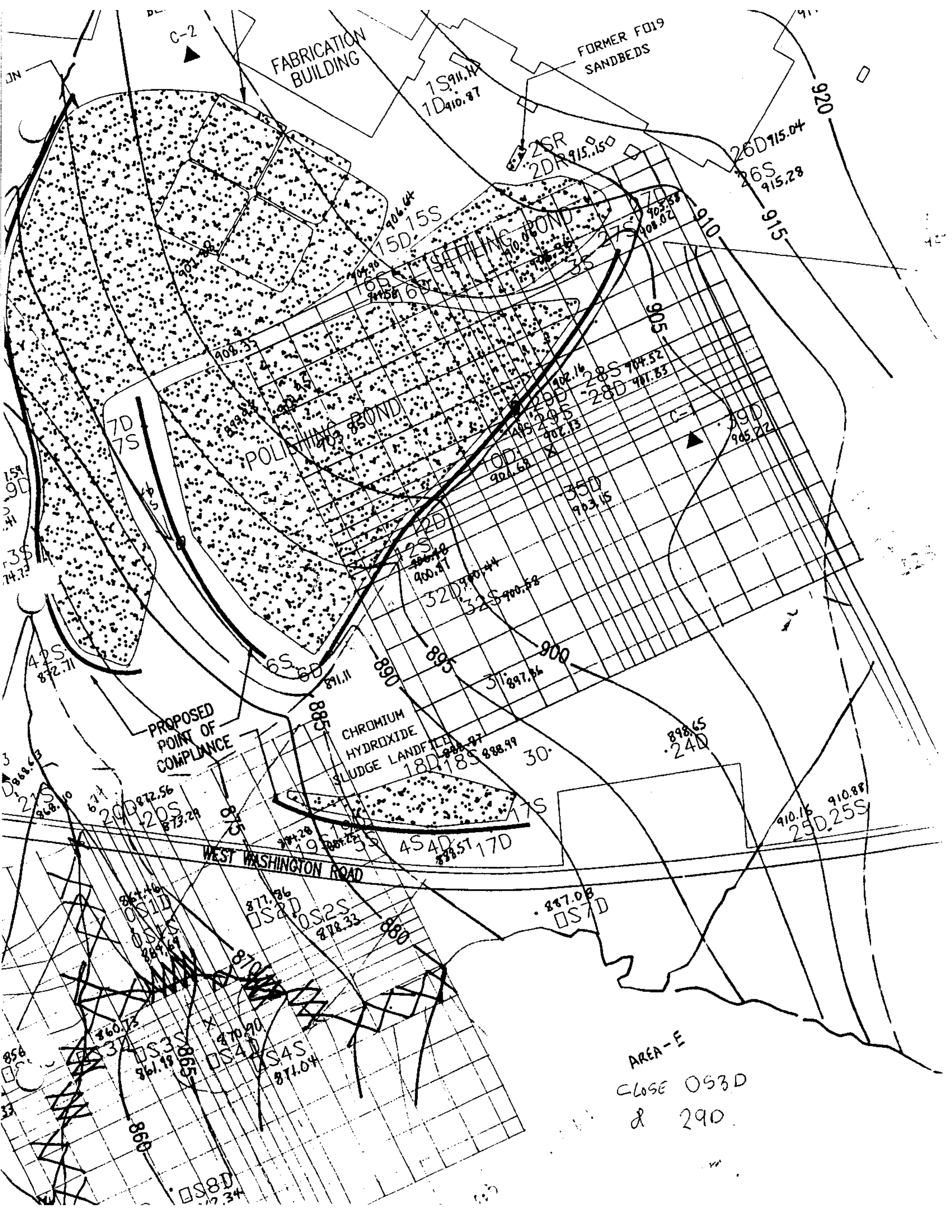
NOTE: FINE DISCRETISATION OF GRID IN THE CENTRAL 100 FEET ZONE NOT DRAWN FOR CLARITY. THIS ZONE WAS DISCRETISED FROM 10 FEET TO 2 FEET



⊠ - PUMPING WELL

■ - CONSTANT HEAD BOUNDARIES

□ - VARIABLE HEADS



FABRICATION BUILDING
FORMER F019 SANDBEDS
C-2
1S 911.11
1D 910.87
2SR
2DR 915.15
26D 915.04
26S 915.28
920
915
910
905
900
895
890
885
880
875
870
865
860
15D 15S
SETTLING POND
27D
27S
16S 16D
POLISHING POND
7D 7S
28S 904.52
28D 901.83
29D
29S
C-1
39D 905.22
10D
35D 903.15
12D
12S
32D
32S
6S 6D
42S 872.71
PROPOSED POINT OF COMPLIANCE
CHROMIUM HYDROXIDE SLUDGE LANDFILL
18D 18S
31
30
24D
17S
17D
4S 4D
5S
19
20D 20S
21S
25D 25S
WEST WASHINGTON ROAD
OS1D
OS1S
OS2D
OS2S
OS7D
OS3D
OS3S
OS4D
OS4S
OS8D
AREA-E
CLOSE OS3D
& 29D

WELLS

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1                 U.S. GEOLOGICAL SURVEY MODULAR FINITE-DIFFERENCE GROUND-WATER MODEL
0BONMOD1 1 layer, 35 rows, 35 columns, 0 well                                        unconfined, impermeable bedrock NEAR 29-S
   1 LAYERS          35 ROWS          35 COLUMNS
  1 STRESS PERIOD(S) IN SIMULATION
 MODEL TIME UNIT IS SECONDS
0I/O UNITS:
 ELEMENT OF IUNIT:  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
         I/O UNIT: 11 12  0  0  0  0  0  0 19  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0BAS1 -- BASIC MODEL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT  1
 ARRAYS RHS AND BUFF WILL SHARE MEMORY.
 START HEAD WILL BE SAVED
    11099 ELEMENTS IN X ARRAY ARE USED BY BAS
    11099 ELEMENTS OF X ARRAY USED OUT OF    30000
0BCF1 -- BLOCK-CENTERED FLOW PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 11
 STEADY-STATE SIMULATION
      LAYER  AQUIFER TYPE
      -------------------
         1          1
     2451 ELEMENTS IN X ARRAY ARE USED BY BCF
    13550 ELEMENTS OF X ARRAY USED OUT OF    30000
0WEL1 -- WELL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM 12
 MAXIMUM OF     1 WELLS
        4 ELEMENTS IN X ARRAY ARE USED FOR WELLS
    13554 ELEMENTS OF X ARRAY USED OUT OF    30000
0SIP1 -- STRONGLY IMPLICIT PROCEDURE SOLUTION PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 19
 MAXIMUM OF 100 ITERATIONS ALLOWED FOR CLOSURE
  5 ITERATION PARAMETERS
     5305 ELEMENTS IN X ARRAY ARE USED BY SIP
    18859 ELEMENTS OF X ARRAY USED OUT OF    30000
1BONMOD1 1 layer, 35 rows, 35 columns, 0 well                                        unconfined, impermeable bedrock NEAR 29-S
0
```

BOUNDARY ARRAY FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35I2)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
0 1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1
0 4	1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	-1	1	1
0 5	1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1	1
0 6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	-1	-1	-1	-1	-1	-1	-1	1	1	1	1	1
0 7	1	1	1	1	1	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 8	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 9	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 10	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 11	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 12	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 13	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 14	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 15	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 16	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 17	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 18	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 19	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 20	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 21	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 22	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 23	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 24	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 25	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 26	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 27	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 28	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 29	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 30	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 32	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 33	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 34	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 35	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

1 1 1 1 1
0AQUIFER HEAD WILL BE SET TO 999.90 AT ALL NO-FLOW NODES (IBOUND=0).
0

INITIAL HEAD FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35F5.0)

	1 16 31	2 17 32	3 18 33	4 19 34	5 20 35	6 21	7 22	8 23	9 24	10 25	11 26	12 27	13 28	14 29	15 30
0 1	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 2	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 3	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	904.0	980.0	980.0										
0 4	980.0	903.0	903.0	903.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	902.0	904.0	980.0	980.0										
0 5	980.0	903.0	903.0	903.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	901.0	980.0	980.0	980.0	980.0										
0 6	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0
	980.0	980.0	980.0	980.0	980.0										
0 7	980.0	980.0	980.0	980.0	980.0	980.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 8	980.0	980.0	980.0	980.0	980.0	901.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 9	980.0	980.0	980.0	980.0	980.0	901.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 10	980.0	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 11	980.0	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 12	980.0	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 13	980.0	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 14	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 15	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	880.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 16	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 17	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 18	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	988.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 19	900.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	988.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 20	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 21	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 22	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 23	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 24	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	988.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 25	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 26	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 27	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 28	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 29	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	988.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 30	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										
0 31	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	880.0										
0 32	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
	980.0	980.0	980.0	980.0	980.0										

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0 33     980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0
         980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0
         980.0    980.0    980.0    980.0    980.0
0 34     980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0
         980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0
         980.0    980.0    960.0    980.0    980.0
0 35     980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0
         980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0    980.0
         980.0    980.0    980.0    980.0    980.0
0DEFAULT OUTPUT CONTROL -- THE FOLLOWING OUTPUT COMES AT THE END OF EACH STRESS PERIOD:
 TOTAL VOLUMETRIC BUDGET
          HEAD
          DRAWDOWN
0                                                 COLUMN TO ROW ANISOTROPY =   1.000000
0


                                               DELR WILL BE READ ON UNIT 11 USING FORMAT:          (35F6.3)
                               ------------------------------------------------------------------------------

   60.000        60.000        60.000        60.000        60.000        60.000        30.000        10.000        10.000        5.0000
   5.0000        5.0000        5.0000        3.0000        2.0000        2.0000        2.0000        2.0000        2.0000        2.0000
   2.0000        3.0000        5.0000        5.0000        5.0000        5.0000        10.000        10.000        30.000        60.000
   60.000        60.000        60.000        60.000        60.000
0


                                               DELC WILL BE READ ON UNIT 11 USING FORMAT:          (35F6.3)
                               ------------------------------------------------------------------------------

   60.000        60.000        60.000        60.000        60.000        60.000        30.000        10.000        10.000        5.0000
   5.0000        5.0000        5.0000        3.0000        2.0000        2.0000        2.0000        2.0000        2.0000        2.0000
   2.0000        3.0000        5.0000        5.0000        5.0000        5.0000        10.000        10.000        30.000        60.000
   60.000        60.000        60.000        60.000        60.000
0                                                       HYD. COND. ALONG ROWS =  0.8000000E-05 FOR LAYER  1
0                                                                    BOTTOM =   868.0000     FOR LAYER  1
0


                                                        SOLUTION BY THE STRONGLY IMPLICIT PROCEDURE
                                                        -------------------------------------------
0                                            MAXIMUM ITERATIONS ALLOWED FOR CLOSURE =      100
                                                           ACCELERATION PARAMETER =     1.0000
                                                HEAD CHANGE CRITERION FOR CLOSURE =    0.10000E-02
                                                SIP HEAD CHANGE PRINTOUT INTERVAL =        1
0
    5 ITERATION PARAMETERS CALCULATED FROM SPECIFIED WSEED = 0.00100000 :

           0.0000000E+00  0.8221720E+00  0.9683772E+00  0.9943766E+00  0.9990000E+00
1                                                  STRESS PERIOD NO.   1, LENGTH =    1728000.
                                                   ----------------------------------------------

                                                   NUMBER OF TIME STEPS =    20

                                                    MULTIPLIER FOR DELT =     1.000

                                                 INITIAL TIME STEP SIZE =    86400.00
0            1 WELLS
                                              LAYER     ROW     COL     STRESS RATE    WELL NO.
                                              ----------------------------------------------
                                                1        18      18    -0.39000E-02       1
0
    37 ITERATIONS FOR TIME STEP    1 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ----------------------------------------------------------------------------------------------------------------------------------
    99.59      (  1, 15, 12)  -37.37      (  1,  8,  2)  -38.75      (  1,  2,  5)  -47.57      (  1,  1, 20)  -44.64      (  1, 20, 19)
   -4.491      (  1,  5,  1)  -4.201      (  1, 29,  7)  -4.546      (  1, 28,  8)  -7.529      (  1, 28, 14)  -14.18      (  1, 25, 17)
   -3.892      (  1, 18, 18)   1.880      (  1, 32,  4)  -1.945      (  1, 18, 18)   2.765      (  1, 33,  6)   2.276      (  1, 19, 17)
    1.248      (  1, 18, 18)  0.8074      (  1, 18, 18)  0.6340      (  1, 18, 18) -0.2676      (  1, 21, 15) -0.2533      (  1, 17, 18)
   0.8405E-01 (  1, 23, 13)  0.1017      (  1, 21, 15)  0.6966E-01 (  1, 18, 18)  0.1143      (  1, 18, 18)  0.6154E-01 (  1, 18, 18)
   0.3510E-01 (  1, 18, 18) -0.1317E-01 (  1, 17, 19) -0.1174E-01 (  1, 15, 20) -0.7586E-02 (  1, 18, 18)  0.1265E-01 (  1, 26, 10)
   0.3718E-02 (  1, 23,  7) -0.4729E-02 (  1, 25, 11) -0.2955E-02 (  1, 21, 15) -0.5718E-02 (  1, 18, 18) -0.3966E-02 (  1, 18, 18)
  -0.2120E-02 (  1, 18, 18)  0.6469E-03 (  1, 17, 18)
0
     1 ITERATIONS FOR TIME STEP    2 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ----------------------------------------------------------------------------------------------------------------------------------
   0.1544E-03 (  1, 17, 18)
0
     1 ITERATIONS FOR TIME STEP    3 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.1178E-03 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP    4 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ----------------------------------------------------------------------------------------------------------------------------------
   0.1353E-03 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP    5 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ----------------------------------------------------------------------------------------------------------------------------------
   0.1276E-03 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP    6 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.1481E-03 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP    7 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.1062E-03 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP    8 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.1002E-03 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP    9 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.7150E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP   10 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 --------------------------------------------------------------------------------------------------------------------------------
   0.9189E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP   11 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 --------------------------------------------------------------------------------------------------------------------------------
   0.5974E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP   12 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 --------------------------------------------------------------------------------------------------------------------------------
   0.5965E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP   13 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 --------------------------------------------------------------------------------------------------------------------------------
   0.5045E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP   14 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACN ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.5018E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP   15 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.4578E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP   16 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.1834E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP   17 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.3889E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP   18 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.1749E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP   19 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.3925E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP   20 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.1176E-04 (  1, 17, 19)
0
1                    HEAD IN LAYER  1 AT END OF TIME STEP 20 IN STRESS PERIOD  1
              ----------------------------------------------------------------

              1         2         3         4         5         6         7         8         9        10
             11        12        13        14        15        16        17        18        19        20
             21        22        23        24        25        26        27        28        29        30
             31        32        33        34        35
 ..............................................................................................................
0  1      902.8     902.8     902.7     902.6     902.5     902.4     902.3     902.3     902.3     902.3
          902.3     902.3     902.3     902.3     902.3     902.3     902.3     902.3     902.3     902.3
          902.3     902.3     902.3     902.3     902.3     902.3     902.3     902.3     902.3     902.4
          902.6     902.9     903.2     903.3     903.3
0  2      902.8     902.8     902.7     902.7     902.5     902.3     902.3     902.2     902.2     902.2
          902.2     902.2     902.2     902.2     902.2     902.2     902.2     902.2     902.2     902.2
          902.2     902.2     902.2     902.2     902.2     902.2     902.2     902.2     902.2     902.3
          902.5     902.9     903.4     903.3     903.3
0  3      902.8     902.9     902.8     902.7     902.5     902.3     902.1     902.1     902.1     902.1
          902.1     902.0     902.0     902.0     902.0     902.0     902.0     902.0     902.0     902.0
          902.0     902.0     902.0     902.0     902.0     902.0     902.0     902.0     902.0     902.1
          902.3     902.8     904.0     903.5     903.3
0  4      902.8     903.0     903.0     903.0     902.4     902.1     901.9     901.9     901.9     901.8
          901.8     901.8     901.8     901.8     901.8     901.8     901.8     901.8     901.8     901.8
          901.8     901.8     901.8     901.8     901.8     901.7     901.7     901.7     901.7     901.7
          901.8     902.0     904.0     903.3     903.0
0  5      902.6     903.0     903.0     903.0     902.2     901.8     901.6     901.6     901.6     901.5
          901.5     901.5     901.5     901.5     901.5     901.5     901.5     901.5     901.5     901.5
          901.4     901.4     901.4     901.4     901.4     901.4     901.4     901.4     901.3     901.3
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	901.0	901.7	902.5	902.6	902.5					
0 6	902.0	902.0	902.0	901.8	901.5	901.4	901.3	901.2	901.2	901.2
	901.2	901.1	901.1	901.1	901.1	901.1	901.1	901.1	901.1	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0
	901.0	901.3	901.7	901.9	902.0					
0 7	901.5	901.4	901.3	901.0	900.8	901.1	901.0	901.0	901.0	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0
	901.0	901.0	900.8	900.6	900.4	900.3	900.2	900.1	900.1	900.3
	900.6	901.0	901.3	901.5	901.6					
0 8	901.2	901.2	900.9	900.7	900.4	901.0	900.3	900.0	899.8	899.6
	899.5	899.5	899.4	899.3	899.3	899.3	899.3	899.5	899.2	899.2
	899.2	899.2	899.2	899.2	899.2	899.2	899.2	899.3	899.5	900.0
	900.5	900.8	901.2	901.4	901.4					
0 9	901.1	901.0	900.8	900.5	900.2	901.0	900.0	899.4	899.1	898.9
	898.8	898.6	898.5	898.4	898.3	898.3	898.3	898.3	898.3	898.3
	898.3	898.3	898.3	898.4	898.4	898.5	898.7	898.9	899.3	899.9
	900.4	900.8	901.1	901.3	901.4					
0 10	901.1	900.9	900.7	900.4	900.0	900.7	899.7	899.1	898.7	898.4
	898.1	897.9	897.7	897.6	897.5	897.5	897.4	897.4	897.4	897.4
	897.4	897.5	897.5	897.7	897.8	898.0	898.3	898.6	899.1	899.8
	900.3	900.7	901.0	901.2	901.3					
0 11	901.0	900.9	900.6	900.3	900.0	900.6	899.5	898.8	898.4	898.0
	897.7	897.4	897.1	896.9	896.9	896.8	896.7	896.7	896.7	896.7
	896.8	896.8	897.0	897.2	897.4	897.7	898.0	898.3	898.9	899.7
	900.3	900.7	901.0	901.2	901.3					
0 12	901.0	900.8	900.5	900.2	900.0	900.4	899.4	898.6	898.1	897.6
	897.3	896.9	896.5	896.2	896.1	896.0	895.9	895.9	895.9	895.9
	896.0	896.1	896.4	896.7	897.0	897.3	897.7	898.2	898.8	899.7
	900.2	900.7	901.0	901.2	901.2					
0 13	900.9	900.8	900.4	900.1	900.0	900.3	899.2	898.4	897.8	897.3
	896.9	896.4	895.8	895.4	895.1	895.0	894.9	894.8	894.8	894.9
	895.1	895.3	895.7	896.2	896.6	897.0	897.5	898.0	898.7	899.6
	900.2	900.6	900.9	901.1	901.2					
0 14	900.9	900.7	900.3	900.0	900.0	900.2	899.1	898.2	897.7	897.1
	896.6	896.0	895.3	894.6	894.2	893.9	893.6	893.5	893.6	893.8
	894.1	894.5	895.2	895.8	896.4	896.8	897.4	897.9	898.6	899.6
	900.2	900.6	900.9	901.1	901.2					
0 15	900.8	900.7	900.3	900.0	900.0	900.1	899.1	898.2	897.6	896.9
	896.4	895.8	895.0	894.1	893.5	893.0	892.5	892.3	892.5	892.9
	893.4	894.0	894.9	895.6	896.2	896.7	897.3	897.8	898.6	899.5
	900.2	900.6	900.9	901.1	901.2					
0 16	900.8	900.7	900.3	900.0	900.0	900.1	899.0	898.1	897.5	896.9
	896.3	895.7	894.8	893.8	892.9	892.2	891.4	890.9	891.4	892.1
	892.9	893.7	894.7	895.5	896.1	896.6	897.2	897.8	898.6	899.5
	900.2	900.6	900.9	901.1	901.2					
0 17	900.8	900.6	900.2	900.0	900.0	900.1	899.0	898.1	897.4	896.8
	896.3	895.6	894.6	893.5	892.4	891.3	889.8	888.3	889.8	891.3
	892.4	893.4	894.5	895.4	896.1	896.6	897.2	897.7	898.5	899.5
	900.1	900.6	900.9	901.1	901.1					
0 18	900.8	900.6	900.2	900.0	899.9	900.0	898.9	898.0	897.4	896.7
	896.2	895.5	894.5	893.3	892.2	890.8	888.2	880.2	888.2	890.7
	892.1	893.2	894.4	895.3	896.0	896.5	897.1	897.7	898.5	899.5
	900.1	900.5	900.9	901.0	901.1					
0 19	900.8	900.6	900.2	900.0	899.9	900.0	898.9	898.0	897.4	896.7
	896.2	895.5	894.5	893.4	892.3	891.2	889.7	888.1	889.7	891.2
	892.3	893.3	894.4	895.3	896.0	896.5	897.1	897.7	898.5	899.5
	900.1	900.5	900.8	901.0	901.1					
0 20	900.7	900.6	900.1	900.0	899.9	899.9	898.9	897.9	897.3	896.7
	896.1	895.5	894.6	893.5	892.7	891.9	891.2	890.6	891.1	891.9
	892.7	893.5	894.5	895.3	896.0	896.5	897.1	897.6	898.5	899.5
	900.1	900.5	900.8	901.0	901.1					
0 21	900.7	900.5	900.1	900.0	899.9	899.9	898.8	897.9	897.3	896.7
	896.2	895.5	894.7	893.8	893.2	892.7	892.2	892.0	892.2	892.6
	893.1	893.7	894.6	895.4	896.0	896.5	897.1	897.6	898.4	899.4
	900.1	900.5	900.8	901.0	901.1					
0 22	900.7	900.5	900.1	900.0	899.9	899.9	898.8	897.9	897.3	896.7
	896.2	895.6	894.9	894.2	893.7	893.4	893.2	893.1	893.2	893.4
	893.7	894.1	894.8	895.5	896.0	896.5	897.0	897.6	898.4	899.4
	900.1	900.5	900.8	901.0	901.1					
0 23	900.7	900.5	900.0	900.0	899.9	899.8	898.7	897.8	897.3	896.7
	896.3	895.8	895.2	894.8	894.5	894.3	894.2	894.2	894.2	894.3
	894.5	894.7	895.1	895.7	896.1	896.5	897.1	897.6	898.4	899.4
	900.0	900.5	900.8	901.0	901.0					
0 24	900.6	900.4	900.0	900.0	899.9	899.7	898.7	897.8	897.3	896.8
	896.5	896.1	895.7	895.4	895.2	895.1	895.1	895.1	895.1	895.1
	895.2	895.3	895.6	896.0	896.3	896.7	897.1	897.6	898.4	899.4
	900.0	900.4	900.7	900.9	901.0					
0 25	900.6	900.4	900.0	900.0	899.8	899.6	898.6	897.9	897.4	897.0
	896.7	896.4	896.1	895.9	895.8	895.7	895.7	895.7	895.7	895.7
	895.7	895.8	896.0	896.3	896.5	896.8	897.2	897.6	898.4	899.3
	900.0	900.4	900.7	900.9	901.0					
0 26	900.5	900.3	900.0	899.9	899.8	899.6	898.6	897.9	897.5	897.1
	896.9	896.6	896.4	896.3	896.2	896.2	896.1	896.1	896.1	896.1
	896.2	896.2	896.3	896.5	896.8	897.0	897.3	897.7	898.4	899.3
	900.0	900.4	900.7	900.9	901.0					
0 27	900.5	900.3	900.0	899.9	899.8	899.5	898.6	898.0	897.6	897.3
	897.2	897.0	896.8	896.8	896.7	896.7	896.7	896.7	896.7	896.7
	896.7	896.7	896.8	896.9	897.1	897.2	897.5	897.8	898.4	899.3
	899.9	900.4	900.6	900.8	900.9					
0 28	900.4	900.2	900.0	899.9	899.7	899.4	898.6	898.1	897.8	897.6
	897.5	897.4	897.3	897.2	897.2	897.2	897.2	897.2	897.2	897.2
	897.2	897.2	897.2	897.3	897.4	897.5	897.7	897.9	898.4	899.3
	899.9	900.3	900.6	900.8	900.9					
0 29	900.2	900.0	899.9	899.8	899.7	899.3	898.7	898.3	898.2	898.1
	898.0	898.0	897.9	897.9	897.9	897.9	897.9	897.9	897.9	897.9
	897.9	897.9	897.9	897.9	898.0	898.0	898.1	898.3	898.6	899.2
	899.8	900.2	900.5	900.7	900.7					
0 30	900.0	899.9	899.9	899.7	899.6	899.3	898.9	898.8	898.8	898.7
	898.7	898.7	898.7	898.7	898.7	898.7	898.7	898.7	898.7	898.7
	898.7	898.7	898.7	898.7	898.7	898.7	898.8	898.8	898.9	899.3
	899.7	900.1	900.3	900.5	900.5					
0 31	899.9	899.8	899.8	899.7	899.5	899.3	899.2	899.2	899.1	899.1
	899.1	899.1	899.1	899.1	899.1	899.1	899.1	899.1	899.1	899.1
	899.1	899.1	899.1	899.1	899.1	899.1	899.2	899.2	899.2	899.4
	899.7	899.9	900.1	900.3	900.3					
0 32	899.8	899.8	899.7	899.6	899.5	899.4	899.4	899.4	899.3	899.3
	899.3	899.3	899.3	899.3	899.3	899.3	899.3	899.3	899.3	899.3
	899.3	899.3	899.3	899.4	899.4	899.4	899.4	899.4	899.4	899.5

	899.7	899.9	900.0	900.1	900.2					
0 33	899.7	899.7	899.7	899.6	899.6	899.5	899.5	899.5	899.5	899.5
	899.5	899.5	899.5	899.5	899.5	899.5	899.5	899.5	899.5	899.5
	899.5	899.5	899.5	899.5	899.5	899.5	899.5	899.5	899.5	899.6
	899.7	899.8	899.9	900.0	900.1					
0 34	899.7	899.7	899.7	899.6	899.6	899.5	899.5	899.5	899.5	899.5
	899.5	899.5	899.5	899.5	899.5	899.5	899.5	899.5	899.5	899.5
	899.5	899.5	899.5	899.5	899.5	899.5	899.6	899.6	899.6	899.6
	899.7	899.8	899.9	900.0	900.0					
0 35	899.7	899.7	899.7	899.6	899.6	899.6	899.5	899.5	899.5	899.6
	899.6	899.6	899.6	899.6	899.6	899.6	899.6	899.6	899.6	899.6
	899.6	899.6	899.6	899.6	899.6	899.6	899.6	899.6	899.6	899.7
	899.7	899.8	899.9	899.9	900.0					

1 DRAWDOWN IN LAYER 1 AT END OF TIME STEP 20 IN STRESS PERIOD 1

	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
	21	22	23	24	25	26	27	28	29	30
	31	32	33	34	35					
0 1	77.22	77.24	77.29	77.38	77.51	77.63	77.69	77.71	77.72	77.73
	77.73	77.73	77.73	77.73	77.74	77.74	77.74	77.74	77.74	77.74
	77.74	77.74	77.73	77.73	77.73	77.73	77.72	77.72	77.69	77.61
	77.40	77.11	76.83	76.73	76.72					
0 2	77.20	77.21	77.25	77.35	77.51	77.66	77.75	77.78	77.79	77.79
	77.80	77.80	77.81	77.81	77.81	77.81	77.81	77.81	77.81	77.81
	77.81	77.81	77.81	77.81	77.81	77.81	77.81	77.80	77.79	77.71
	77.48	77.11	76.64	76.65	76.70					
0 3	77.18	77.14	77.16	77.26	77.52	77.75	77.87	77.91	77.92	77.94
	77.94	77.95	77.96	77.96	77.96	77.97	77.97	77.97	77.97	77.97
	77.98	77.98	77.98	77.98	77.99	77.99	77.99	77.99	77.98	77.93
	77.71	77.20	0.0000E+00	76.53	76.74					
0 4	77.19	0.0000E+00	0.0000E+00	0.0000E+00	77.55	77.90	78.06	78.12	78.14	78.16
	78.17	78.18	78.19	78.20	78.20	78.21	78.21	78.21	78.22	78.22
	78.22	78.23	78.23	78.24	78.25	78.25	78.26	78.27	78.29	78.30
	78.25	0.0000E+00	0.0000E+00	76.73	76.98					
0 5	77.40	0.0000E+00	0.0000E+00	0.0000E+00	77.80	78.18	78.35	78.41	78.44	78.47
	78.48	78.49	78.51	78.52	78.52	78.53	78.53	78.54	78.54	78.55
	78.55	78.56	78.56	78.57	78.58	78.59	78.61	78.62	78.65	78.73
	0.0000E+00	78.28	77.48	77.44	77.48					
0 6	78.01	77.95	78.03	78.18	78.50	78.62	78.73	78.78	78.80	78.83
	78.84	78.86	78.88	78.90	78.91	78.91	78.92	78.93	78.94	78.95
	78.96	78.98	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	79.04	78.67	78.26	78.08	78.03					
0 7	78.53	78.58	78.75	78.97	79.19	78.92	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	79.21	79.42	79.58	79.70	79.83	79.90	79.92	79.67
	79.37	79.01	78.67	78.48	78.40					
0 8	78.75	78.84	79.07	79.33	79.59	0.0000E+00	79.69	80.04	80.22	80.36
	80.45	80.54	80.62	80.67	80.70	80.72	80.73	80.75	80.76	80.77
	80.78	80.80	80.82	80.84	80.84	80.83	80.79	80.69	80.47	79.97
	79.54	79.15	78.83	78.64	78.55					
0 9	78.86	78.97	79.23	79.51	79.81	0.0000E+00	80.04	80.56	80.85	81.08
	81.24	81.39	81.52	81.61	81.65	81.68	81.71	81.72	81.74	81.74
	81.74	81.73	81.70	81.64	81.56	81.47	81.32	81.12	80.74	80.11
	79.62	79.22	78.91	78.71	78.63					
0 10	78.94	79.06	79.35	79.65	0.0000E+00	79.26	80.30	80.94	81.32	81.64
	81.86	82.09	82.29	82.43	82.50	82.54	82.58	82.59	82.60	82.60
	82.58	82.54	82.46	82.31	82.15	81.98	81.74	81.44	80.94	80.21
	79.68	79.27	78.96	78.77	78.68					
0 11	79.00	79.12	79.43	79.74	0.0000E+00	79.42	80.47	81.18	81.62	82.01
	82.29	82.58	82.86	83.05	83.15	83.21	83.25	83.27	83.28	83.26
	83.22	83.16	83.01	82.79	82.56	82.33	82.01	81.65	81.07	80.27
	79.72	79.31	79.00	78.81	78.72					
0 12	79.05	79.18	79.51	79.83	0.0000E+00	79.57	80.63	81.41	81.90	82.37
	82.72	83.10	83.48	83.77	83.92	84.01	84.07	84.10	84.10	84.06
	83.99	83.87	83.63	83.29	82.96	82.66	82.26	81.84	81.19	80.33
	79.75	79.34	79.03	78.84	78.75					
0 13	79.10	79.24	79.59	79.92	0.0000E+00	79.70	80.77	81.61	82.16	82.70
	83.13	83.61	84.16	84.61	84.86	85.03	85.15	85.20	85.17	85.07
	84.93	84.70	84.29	83.79	83.35	82.98	82.49	82.01	81.29	80.39
	79.79	79.37	79.07	78.88	78.79					
0 14	79.14	79.29	79.65	0.0000E+00	80.02	79.80	80.88	81.75	82.34	82.93
	83.41	83.99	84.70	85.38	85.82	86.14	86.38	86.49	86.41	86.19
	85.89	85.47	84.83	84.16	83.62	83.19	82.65	82.13	81.37	80.43
	79.82	79.40	79.09	78.90	78.82					
0 15	79.17	79.32	79.69	0.0000E+00	80.03	79.86	80.94	81.83	82.43	83.05
	83.56	-15.81	85.01	85.88	86.51	87.02	87.47	87.68	87.49	87.06
	86.57	85.97	85.14	84.36	83.77	83.30	82.73	82.20	81.41	80.46
	79.84	79.42	79.11	78.92	78.83					
0 16	79.19	79.34	79.72	0.0000E+00	80.04	79.90	80.99	81.89	82.50	83.14
	83.66	84.33	85.23	86.25	87.07	87.83	88.62	89.12	88.64	87.87
	87.13	86.33	85.35	84.49	83.86	83.37	82.79	82.24	81.44	80.48
	79.85	79.43	79.12	78.93	78.85					
0 17	79.21	79.36	79.76	0.0000E+00	80.04	79.95	81.03	81.94	82.56	83.21
	83.74	84.44	85.39	86.54	87.56	88.67	90.15	91.75	90.17	88.71
	87.62	86.62	85.50	84.59	83.94	83.44	82.84	82.28	81.47	80.50
	79.86	79.44	79.14	78.95	78.86					
0 18	79.23	79.39	79.79	0.0000E+00	80.05	79.99	81.07	81.99	82.61	83.26
	83.80	84.51	85.48	86.68	95.82	89.22	91.80	99.85	91.83	89.26
	87.88	86.76	85.59	84.66	83.99	83.48	82.88	82.32	81.50	80.52
	79.88	79.45	79.15	78.96	78.87					
0 19	-0.7554	79.41	79.82	0.0000E+00	80.06	80.03	81.11	82.03	82.65	83.30
	83.84	84.53	85.49	94.64	87.67	88.78	90.27	91.88	90.30	88.82
	87.73	86.72	85.60	84.68	84.02	83.51	82.91	82.35	81.52	80.53
	79.89	79.46	79.16	78.97	78.89					
0 20	79.26	79.43	79.85	0.0000E+00	80.07	80.07	81.15	82.06	82.68	83.32
	83.85	84.53	85.43	86.46	87.28	88.05	88.84	89.35	88.86	88.09
	87.34	86.53	85.53	84.67	84.03	83.53	82.93	82.37	81.55	80.55
	79.90	79.48	79.17	78.99	78.90					
0 21	79.28	79.45	79.89	0.0000E+00	80.08	80.10	81.18	82.09	82.70	83.33
	83.84	84.49	85.32	86.19	86.82	87.34	87.79	88.01	87.81	87.38
	86.87	86.26	85.42	84.62	84.01	83.53	82.95	82.39	81.57	80.57
	79.91	79.49	79.19	79.00	78.91					
0 22	79.31	79.48	79.93	0.0000E+00	80.09	80.15	81.22	82.12	82.72	83.33
	83.81	84.40	85.13	85.82	86.26	86.58	86.83	86.93	86.84	86.61
	86.31	85.88	85.22	84.53	83.97	83.52	82.95	82.40	81.59	80.58

	79.93	79.50	79.20	79.02	78.93					
0 23	79.34	79.52	0.0000E+00	80.01	80.11	80.21	81.28	82.15	82.72	83.28
	83.72	84.21	84.77	85.23	85.48	85.65	85.77	85.81	85.78	85.68
	85.53	85.29	84.86	84.33	83.86	83.46	82.94	82.42	81.62	80.61
	79.95	79.53	79.23	79.04	78.95					
0 24	79.39	79.57	0.0000E+00	80.03	80.14	80.29	81.33	82.16	82.69	83.18
	83.54	83.93	84.33	84.61	84.76	84.86	84.92	84.94	92.93	84.88
	84.80	84.67	84.40	84.03	83.67	83.34	82.88	82.40	81.64	80.64
	79.98	79.55	79.26	79.07	78.98					
0 25	79.43	79.62	0.0000E+00	80.04	80.16	80.35	81.36	82.14	82.62	83.04
	83.34	83.64	83.93	84.12	84.22	84.28	84.32	84.33	84.33	84.30
	84.25	84.17	84.00	83.74	83.46	83.19	82.80	82.36	81.65	80.67
	80.01	79.58	79.29	79.10	79.02					
0 26	79.48	79.66	0.0000E+00	80.06	80.18	80.41	81.39	82.11	82.54	82.89
	83.14	83.38	83.59	83.73	83.80	83.84	83.86	83.88	83.87	83.86
	83.83	83.77	83.66	83.46	83.25	83.03	82.70	82.31	81.64	80.69
	80.03	79.61	79.32	79.13	79.05					
0 27	79.54	79.73	0.0000E+00	80.08	80.22	80.49	81.40	82.04	82.39	82.67
	82.85	83.02	83.16	83.25	83.29	83.31	83.33	83.34	83.34	83.33
	83.31	83.28	83.21	83.09	82.94	82.78	82.53	82.21	81.62	80.72
	80.07	79.65	79.36	79.18	79.09					
0 28	79.62	79.82	0.0000E+00	80.11	80.26	80.56	81.39	81.92	82.19	82.39
	82.52	82.64	82.73	82.79	82.81	82.83	82.84	82.85	82.85	82.84
	82.83	82.82	82.77	82.70	82.60	82.49	82.31	82.05	81.57	80.74
	80.11	79.69	79.41	79.23	79.15					
0 29	79.76	0.0000E+00	80.05	80.16	80.33	80.67	81.32	81.65	81.82	89.92
	81.99	82.04	82.09	82.11	82.13	82.13	82.14	82.14	82.14	82.14
	82.14	82.13	82.11	82.08	82.03	81.98	81.88	81.74	81.42	80.76
	80.18	79.78	79.51	79.34	79.26					
0 30	0.0000E+00	80.07	80.15	80.26	80.44	80.73	81.05	81.18	81.24	81.27
	81.29	81.31	81.32	81.33	81.33	81.34	81.34	81.34	81.34	81.34
	81.34	81.33	81.33	81.32	81.30	81.28	81.25	81.19	81.06	80.70
	80.27	79.94	79.70	79.55	79.47					
0 31	80.12	80.17	80.23	80.33	80.47	80.65	80.79	80.84	80.86	80.87
	80.88	80.88	80.88	80.89	80.89	80.89	80.89	80.89	80.88	80.88
	80.88	80.88	80.88	80.87	80.86	80.86	80.84	80.81	80.75	80.57
	80.30	80.06	79.87	79.75	-20.32					
0 32	80.21	80.24	80.29	80.37	80.46	80.57	80.63	80.65	80.66	80.66
	80.66	80.66	80.66	80.66	80.66	80.66	80.66	80.66	80.66	80.66
	80.66	80.65	80.65	80.65	80.64	80.64	80.63	80.61	80.58	80.47
	80.29	80.12	79.98	79.88	79.83					
0 33	80.26	80.28	80.32	80.38	80.44	80.50	80.53	80.54	80.54	80.54
	80.54	80.54	80.54	80.54	80.54	80.54	80.54	80.53	80.53	80.53
	80.53	80.53	80.53	80.52	80.52	80.52	80.51	80.50	80.48	80.40
	80.28	80.16	80.05	79.98	79.94					
0 34	80.29	80.31	80.34	80.38	80.43	80.47	80.48	80.48	80.48	80.48
	80.48	80.48	80.47	80.47	80.47	80.47	80.47	80.47	80.47	80.47
	80.47	80.46	80.46	80.46	80.46	80.45	80.45	80.44	80.42	80.37
	80.27	80.18	80.09	80.03	80.00					
0 35	80.31	80.32	80.35	80.38	80.42	80.45	80.45	80.45	80.45	80.45
	80.45	80.45	80.45	80.44	80.44	80.44	80.44	80.44	80.44	80.44
	80.44	80.44	80.43	80.43	80.43	80.42	80.42	80.41	80.40	80.35
	80.27	80.19	80.11	80.06	80.03					

0

VOLUMETRIC BUDGET FOR ENTIRE MODEL AT END OF TIME STEP 20 IN STRESS PERIOD 1

	CUMULATIVE VOLUMES	L**3	RATES FOR THIS TIME STEP	L**3/T
0	IN:		IN:	
	STORAGE =	0.00000E+00	STORAGE =	0.00000E+00
	CONSTANT HEAD =	11019.	CONSTANT HEAD =	0.63768E-02
	WELLS =	0.00000E+00	WELLS =	0.00000E+00
0	TOTAL IN =	11019.	TOTAL IN =	0.63768E-02
0	OUT:		OUT:	
	STORAGE =	0.00000E+00	STORAGE =	0.00000E+00
	CONSTANT HEAD =	4280.1	CONSTANT HEAD =	0.24769E-02
	WELLS =	6739.2	WELLS =	0.39000E-02
0	TOTAL OUT =	11019.	TOTAL OUT =	0.63769E-02
0	IN - OUT =	-0.35352	IN - OUT =	-0.76834E-07
0	PERCENT DISCREPANCY =	0.00	PERCENT DISCREPANCY =	0.00

0

TIME SUMMARY AT END OF TIME STEP 20 IN STRESS PERIOD 1

	SECONDS	MINUTES	HOURS	DAYS	YEARS
TIME STEP LENGTH	86400.0	1440.00	24.0000	1.00000	0.273785E-02
STRESS PERIOD TIME	0.172800E+07	28800.0	480.000	20.0000	0.547570E-01
TOTAL SIMULATION TIME	0.172800E+07	28800.0	480.000	20.0000	0.547570E-01

1

T29S FINAL!
NO WELLS

1 U.S. GEOLOGICAL SURVEY MODULAR FINITE-DIFFERENCE GROUND-WATER MODEL
0BONMOD1 1 layer, 35 rows, 35 columns, 0 well unconfined, impermeable bedrock NEAR 29-S
1 LAYERS 35 ROWS 35 COLUMNS
1 STRESS PERIOD(S) IN SIMULATION
MODEL TIME UNIT IS SECONDS
0I/O UNITS:
ELEMENT OF IUNIT: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
I/O UNIT: 11 0 0 0 0 0 0 0 19 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0BAS1 -- BASIC MODEL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 1
ARRAYS RHS AND BUFF WILL SHARE MEMORY.
START HEAD WILL BE SAVED
11099 ELEMENTS IN X ARRAY ARE USED BY BAS
11099 ELEMENTS OF X ARRAY USED OUT OF 30000
0BCF1 -- BLOCK-CENTERED FLOW PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 11
STEADY-STATE SIMULATION

LAYER	AQUIFER TYPE
1	1

2451 ELEMENTS IN X ARRAY ARE USED BY BCF
13550 ELEMENTS OF X ARRAY USED OUT OF 30000
0SIP1 -- STRONGLY IMPLICIT PROCEDURE SOLUTION PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 19
MAXIMUM OF 100 ITERATIONS ALLOWED FOR CLOSURE
5 ITERATION PARAMETERS
5305 ELEMENTS IN X ARRAY ARE USED BY SIP
18855 ELEMENTS OF X ARRAY USED OUT OF 30000

$b = 32 - 36$ feet ✓
$K = 8 \times 10^{-6}$ ft/second
$= 4.8 \times 10^{-4}$ ft/minute
Aquifer test was 1.5×10^{-4} ft/minute.
$Q = 1\frac{3}{4}$ gpm

1BONMOD1 1 layer, 35 rows, 35 columns, 0 well unconfined, impermeable bedrock NEAR 29-S
0

BOUNDARY ARRAY FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35I2)

Row	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
0 1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1
0 4	1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	-1	1	1
0 5	1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	1	1	1	1
0 6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	-1	-1	-1	-1	-1	-1	-1	1	1	1	1	1
0 7	1	1	1	1	1	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 8	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 9	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 10	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 11	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 12	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 13	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 14	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 15	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 16	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 17	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 18	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 19	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 20	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 21	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 22	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 23	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 24	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 25	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 26	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 27	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 28	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 29	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 30	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 32	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 33	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 34	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 35	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

0AQUIFER HEAD WILL BE SET TO 999.90 AT ALL NO-FLOW NODES (IBOUND=0).
0

INITIAL HEAD FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35F5.0)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
0 1	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 2	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 3	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	904.0	980.0	980.0
0 4	980.0	903.0	903.0	903.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	902.0	904.0	980.0	980.0
0 5	980.0	903.0	903.0	903.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	901.0	980.0	980.0	980.0	980.0
0 6	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	980.0	980.0	980.0	980.0	980.0
0 7	980.0	980.0	980.0	980.0	980.0	980.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 8	980.0	980.0	980.0	980.0	980.0	901.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 9	980.0	980.0	980.0	980.0	980.0	901.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 10	980.0	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 11	980.0	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 12	980.0	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 13	980.0	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 14	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 15	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	880.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 16	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 17	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 18	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	988.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 19	900.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	988.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 20	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 21	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 22	980.0	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 23	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 24	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	988.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 25	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 26	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 27	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 28	980.0	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 29	980.0	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	988.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 30	900.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 31	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	880.0
0 32	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 33	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0
0 34	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0	980.0																				

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        980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0
        980.0   980.0   980.0   980.0   980.0
0 35    980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0
        980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0   980.0
        980.0   980.0   980.0   980.0   980.0
0DEFAULT OUTPUT CONTROL -- THE FOLLOWING OUTPUT COMES AT THE END OF EACH STRESS PERIOD:
 TOTAL VOLUMETRIC BUDGET
          HEAD
          DRAWDOWN
0                                          COLUMN TO ROW ANISOTROPY =   1.000000
0


                                          DELR WILL BE READ ON UNIT 11 USING FORMAT:            (35F6.3)
                                   ------------------------------------------------------------------

   60.000      60.000      60.000      60.000      60.000      60.000      30.000      10.000      10.000      5.0000
   5.0000      5.0000      5.0000      3.0000      2.0000      2.0000      2.0000      2.0000      2.0000      2.0000
   2.0000      3.0000      5.0000      5.0000      5.0000      5.0000      10.000      10.000      30.000      60.000
   60.000      60.000      60.000      60.000      60.000
0


                                          DELC WILL BE READ ON UNIT 11 USING FORMAT:            (35F6.3)
                                   ------------------------------------------------------------------

   60.000      60.000      60.000      60.000      60.000      60.000      30.000      10.000      10.000      5.0000
   5.0000      5.0000      5.0000      3.0000      2.0000      2.0000      2.0000      2.0000      2.0000      2.0000
   2.0000      3.0000      5.0000      5.0000      5.0000      5.0000      10.000      10.000      30.000      60.000
   60.000      60.000      60.000      60.000      60.000
0                                           HYD. COND. ALONG ROWS =  0.8000000E-05 FOR LAYER  1
0                                                       BOTTOM =   868.0000      FOR LAYER  1
0


                                              SOLUTION BY THE STRONGLY IMPLICIT PROCEDURE
                                              -------------------------------------------
0                                    MAXIMUM ITERATIONS ALLOWED FOR CLOSURE =       100
                                                   ACCELERATION PARAMETER =      1.0000
                                        HEAD CHANGE CRITERION FOR CLOSURE =    0.10000E-02
                                        SIP HEAD CHANGE PRINTOUT INTERVAL =        1
0
   5 ITERATION PARAMETERS CALCULATED FROM SPECIFIED WSEED = 0.00100000 :

         0.0000000E+00  0.8221720E+00  0.9683772E+00  0.9943766E+00  0.9990000E+00
1                                        STRESS PERIOD NO.   1, LENGTH =   1728000.
                                         ----------------------------------------------

                                          NUMBER OF TIME STEPS =     20

                                           MULTIPLIER FOR DELT =     1.000

                                        INITIAL TIME STEP SIZE =   86400.00
0
   36 ITERATIONS FOR TIME STEP   1 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL READ CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   99.59      (  1, 15, 12)  -37.37      (  1,  8,  2)  -38.75      (  1,  2,  5)  -47.57      (  1,  1, 20)  -42.26      (  1, 20, 19)
  -4.491      (  1,  5,  1)  -4.106      (  1, 29,  7)  -4.356      (  1, 28,  8)  -7.140      (  1, 28, 13)  -12.56      (  1, 26, 19)
   1.453      (  1, 30,  6)   1.591      (  1, 32,  4)   1.544      (  1, 35,  2)   2.551      (  1, 33,  6)   1.637      (  1, 20, 14)
  0.1272      (  1, 26,  7)  0.1392      (  1, 26,  8) -0.1340      (  1, 25, 21) -0.1622      (  1, 22, 15) -0.2521      (  1, 26,  9)
  0.5502E-01  (  1, 28,  7)  0.5470E-01  (  1, 25, 10)  0.5052E-01  (  1, 19, 14)  0.1182      (  1, 21, 13)  0.7081E-01  (  1, 24, 24)
  0.1132E-01  (  1, 30,  9) -0.6761E-02  (  1, 23, 11) -0.1556E-01  (  1, 17, 15) -0.2042E-01  (  1, 16, 16) -0.2427E-01  (  1, 27, 14)
  0.3764E-02  (  1, 29, 10)  0.3132E-02  (  1, 32,  5)  0.2659E-02  (  1, 35,  2)  0.7195E-02  (  1, 25, 18)  0.4886E-02  (  1, 18, 13)
  0.5593E-03  (  1, 26,  7)
0
    1 ITERATIONS FOR TIME STEP   2 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
  0.2365E-03  (  1, 25,  8)
0
    1 ITERATIONS FOR TIME STEP   3 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
 -0.1633E-03  (  1, 25, 19)
0
    1 ITERATIONS FOR TIME STEP   4 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
 -0.1353E-03  (  1, 25, 19)
0
    1 ITERATIONS FOR TIME STEP   5 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
 -0.1135E-03  (  1, 25, 20)
0
    1 ITERATIONS FOR TIME STEP   6 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
 -0.9595E-04  (  1, 25, 20)
0
    1 ITERATIONS FOR TIME STEP   7 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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 -0.8193E-04  (  1, 25, 20)
0
    1 ITERATIONS FOR TIME STEP   8 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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 -0.7064E-04  (  1, 25, 20)
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0
     1 ITERATIONS FOR TIME STEP    9 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
  -0.6153E-04 (  1, 25, 20)
0
     1 ITERATIONS FOR TIME STEP   10 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
  -0.5412E-04 (  1, 25, 20)
0
     1 ITERATIONS FOR TIME STEP   11 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.4803E-04 (  1, 25, 20)
0
     1 ITERATIONS FOR TIME STEP   12 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
  -0.4300E-04 (  1, 25, 20)
0
     1 ITERATIONS FOR TIME STEP   13 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
  -0.3880E-04 (  1, 25, 20)
0
     1 ITERATIONS FOR TIME STEP   14 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
  -0.3525E-04 (  1, 25, 20)
0
     1 ITERATIONS FOR TIME STEP   15 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
  -0.3223E-04 (  1, 25, 20)
0
     1 ITERATIONS FOR TIME STEP   16 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.2964E-04 (  1, 25, 20)
0
     1 ITERATIONS FOR TIME STEP   17 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
  -0.2739E-04 (  1, 25, 20)
0
     1 ITERATIONS FOR TIME STEP   18 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
  -0.2544E-04 (  1, 25, 20)
0
     1 ITERATIONS FOR TIME STEP   19 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
  -0.2373E-04 (  1, 25, 20)
0
     1 ITERATIONS FOR TIME STEP   20 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
  -0.2222E-04 (  1, 25, 19)
0
1                  HEAD IN LAYER  1 AT END OF TIME STEP 20 IN STRESS PERIOD  1
                   -----------------------------------------------------------

             1          2          3          4          5          6          7          8          9         10
            11         12         13         14         15         16         17         18         19         20
            21         22         23         24         25         26         27         28         29         30
            31         32         33         34         35
 ..................................................................................................................
 0  1    902.8      902.8      902.7      902.6      902.5      902.4      902.3      902.3      902.3      902.3
         902.3      902.3      902.3      902.3      902.3      902.3      902.3      902.3      902.3      902.3
         902.3      902.3      902.3      902.3      902.3      902.3      902.3      902.3      902.3      902.4
         902.6      902.9      903.2      903.3      903.3
 0  2    902.8      902.8      902.7      902.7      902.5      902.3      902.3      902.2      902.2      902.2
         902.2      902.2      902.2      902.2      902.2      902.2      902.2      902.2      902.2      902.2
         902.2      902.2      902.2      902.2      902.2      902.2      902.2      902.2      902.2      902.3
         902.5      902.9      903.4      903.4      903.4
 0  3    902.8      902.9      902.8      902.7      902.5      902.3      902.1      902.1      902.1      902.1
         902.1      902.1      902.0      902.0      902.0      902.0      902.0      902.0      902.0      902.0
         902.0      902.0      902.0      902.0      902.0      902.0      902.0      902.0      902.0      902.1
         902.3      902.8      904.0      903.5      903.4
 0  4    902.8      903.0      903.0      903.0      902.4      902.1      901.9      901.9      901.9      901.8
         901.8      901.8      901.8      901.8      901.8      901.8      901.8      901.8      901.8      901.8
         901.8      901.8      901.8      901.8      901.8      901.7      901.7      901.7      901.7      901.7
         901.8      902.0      904.0      903.4      903.2
 0  5    902.6      903.0      903.0      903.0      902.2      901.8      901.6      901.6      901.6      901.5
         901.5      901.5      901.5      901.5      901.5      901.5      901.5      901.5      901.5      901.5
         901.5      901.4      901.4      901.4      901.4      901.4      901.4      901.4      901.3      901.3
         901.0      901.9      902.7      902.8      902.8
 0  6    902.0      902.0      902.0      901.8      901.5      901.4      901.3      901.2      901.2      901.2
         901.2      901.1      901.1      901.1      901.1      901.1      901.1      901.1      901.1      901.0
         901.0      901.0      901.0      901.0      901.0      901.0      901.0      901.0      901.0      901.0
         901.3      901.7      902.2      902.4      902.4
 0  7    901.5      901.4      901.3      901.0      900.8      901.1      901.0      901.0      901.0      901.0
         901.0      901.0      901.0      901.0      901.0      901.0      901.0      901.0      901.0      901.0
         901.0      901.0      901.0      901.0      901.0      901.0      901.0      901.0      901.0      901.1
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	901.3	901.6	902.0	902.1	902.2					
0 8	901.2	901.2	900.9	900.7	900.4	901.0	901.0	901.0	901.0	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.1	901.1
	901.3	901.6	901.9	902.0	902.1					
0 9	901.1	901.0	900.8	900.5	900.2	901.0	900.9	901.0	901.0	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.1	901.1
	901.3	901.6	901.8	902.0	902.1					
0 10	901.1	900.9	900.7	900.4	900.0	900.9	900.9	900.9	900.9	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.1	901.1
	901.3	901.6	901.8	902.0	902.0					
0 11	901.0	900.9	900.6	900.3	900.0	900.9	900.9	900.9	900.9	900.9
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.1	901.1
	901.3	901.6	901.8	901.9	902.0					
0 12	901.0	900.8	900.5	900.2	900.0	900.8	900.9	900.9	900.9	900.9
	900.9	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.1	901.1
	901.3	901.6	901.8	901.9	902.0					
0 13	900.9	900.8	900.4	900.1	900.0	900.8	900.9	900.9	900.9	900.9
	900.9	900.9	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.1	901.1
	901.3	901.6	901.8	901.9	902.0					
0 14	900.9	900.7	900.3	900.0	900.0	900.8	900.9	900.9	900.9	900.9
	900.9	900.9	900.9	901.0	901.0	901.0	901.0	901.0	901.0	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.1	901.2
	901.3	901.5	901.7	901.9	902.0					
0 15	900.8	900.7	900.3	900.0	900.1	900.8	900.9	900.9	900.9	900.9
	900.9	900.9	900.9	901.0	901.0	901.0	901.0	901.0	901.0	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.1	901.2
	901.3	901.5	901.7	901.9	901.9					
0 16	900.8	900.7	900.3	900.0	900.1	900.8	900.9	900.9	900.9	900.9
	900.9	900.9	900.9	900.9	901.0	901.0	901.0	901.0	901.0	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.1	901.2
	901.3	901.5	901.7	901.9	901.9					
0 17	900.8	900.6	900.2	900.0	900.1	900.7	900.9	900.9	900.9	900.9
	900.9	900.9	900.9	900.9	901.0	901.0	901.0	901.0	901.0	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.1	901.2
	901.3	901.5	901.7	901.9	901.9					
0 18	900.8	900.6	900.2	900.0	900.1	900.7	900.9	900.9	900.9	900.9
	900.9	900.9	900.9	900.9	900.9	901.0	901.0	901.0	901.0	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.1	901.2
	901.3	901.5	901.7	901.8	901.9					
0 19	900.8	900.6	900.2	900.0	900.1	900.7	900.8	900.9	900.9	900.9
	900.9	900.9	900.9	900.9	900.9	901.0	901.0	901.0	901.0	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.1	901.2
	901.3	901.5	901.7	901.8	901.9					
0 20	900.7	900.6	900.1	900.0	900.1	900.7	900.8	900.9	900.9	900.9
	900.9	900.9	900.9	900.9	900.9	900.9	901.0	901.0	901.0	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.1	901.2
	901.3	901.5	901.7	901.8	901.9					
0 21	900.7	900.5	900.1	900.0	900.1	900.7	900.8	900.9	900.9	900.9
	900.9	900.9	900.9	900.9	900.9	900.9	900.9	901.0	901.0	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.1	901.2
	901.3	901.5	901.7	901.8	901.9					
0 22	900.7	900.5	900.1	900.0	900.1	900.7	900.8	900.9	900.9	900.9
	900.9	900.9	900.9	900.9	900.9	900.9	900.9	901.0	901.0	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.1	901.2
	901.3	901.5	901.7	901.8	901.9					
0 23	900.7	900.5	900.0	900.0	900.2	900.7	900.8	900.9	900.9	900.9
	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9	901.0	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.1	901.2
	901.3	901.5	901.7	901.8	901.9					
0 24	900.6	900.4	900.0	900.0	900.2	900.7	900.8	900.9	900.9	900.9
	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9	901.0
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.1	901.2
	901.3	901.5	901.7	901.8	901.9					
0 25	900.6	900.4	900.0	900.0	900.2	900.7	900.8	900.9	900.9	900.9
	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9
	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.1	901.1
	901.3	901.5	901.7	901.8	901.8					
0 26	900.5	900.3	900.0	900.1	900.2	900.7	900.8	900.8	900.9	900.9
	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9
	900.9	901.0	901.0	901.0	901.0	901.0	901.0	901.0	901.1	901.1
	901.3	901.5	901.6	901.8	901.8					
0 27	900.5	900.3	900.0	900.1	900.3	900.6	900.8	900.8	900.9	900.9
	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9
	900.9	900.9	901.0	901.0	901.0	901.0	901.0	901.0	901.1	901.1
	901.3	901.5	901.6	901.7	901.8					
0 28	900.4	900.2	900.0	900.1	900.3	900.6	900.8	900.8	900.8	900.9
	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9
	900.9	900.9	900.9	901.0	901.0	901.0	901.0	901.0	901.0	901.1
	901.3	901.5	901.6	901.7	901.8					
0 29	900.2	900.0	900.1	900.2	900.3	900.6	900.8	900.8	900.8	900.8
	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9
	900.9	900.9	900.9	900.9	901.0	901.0	901.0	901.0	901.0	901.1
	901.3	901.4	901.6	901.7	901.7					
0 30	900.0	900.1	900.2	900.3	900.4	900.6	900.7	900.8	900.8	900.8
	900.8	900.8	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9
	900.9	900.9	900.9	900.9	900.9	900.9	901.0	901.0	901.0	901.1
	901.2	901.4	901.5	901.5	901.6					
0 31	900.2	900.2	900.3	900.4	900.5	900.6	900.7	900.8	900.8	900.8
	900.8	900.8	900.8	900.8	900.9	900.9	900.9	900.9	900.9	900.9
	900.9	900.9	900.9	900.9	900.9	900.9	900.9	901.0	901.0	901.1
	901.2	901.3	901.4	901.4	901.5					
0 32	900.3	900.3	900.3	900.4	900.5	900.6	900.7	900.8	900.8	900.8
	900.8	900.8	900.8	900.8	900.8	900.8	900.8	900.9	900.9	900.9
	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9	901.0	901.0
	901.1	901.2	901.3	901.3	901.4					
0 33	900.3	900.4	900.4	900.5	900.6	900.7	900.7	900.8	900.8	900.8
	900.8	900.8	900.8	900.8	900.8	900.8	900.8	900.8	900.8	900.9
	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9	901.0	901.0
	901.1	901.2	901.2	901.3	901.3					
0 34	900.4	900.4	900.4	900.5	900.6	900.7	900.7	900.8	900.8	900.8
	900.8	900.8	900.8	900.8	900.8	900.8	900.8	900.8	900.8	900.8
	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9	900.9	901.0

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           901.1        901.2        901.2        901.3        901.3
 0 35      900.4        900.4        900.5        900.5        900.6        900.7        900.7        900.8        900.8        900.8
           900.8        900.8        900.8        900.8        900.8        900.8        900.8        900.8        900.8        900.8
           900.9        900.9        900.9        900.9        900.9        900.9        900.9        900.9        900.9        901.0
           901.1        901.1        901.2        901.2        901.3
1                 DRAWDOWN IN LAYER  1 AT END OF TIME STEP 20 IN STRESS PERIOD  1
                  -------------------------------------------------------------------

               1            2            3            4            5            6            7            8            9           10
              11           12           13           14           15           16           17           18           19           20
              21           22           23           24           25           26           27           28           29           30
              31           32           33           34           35
.....................................................................................................................................
 0  1      77.22        77.24        77.29        77.38        77.50        77.63        77.69        77.71        77.72        77.72
           77.73        77.73        77.73        77.73        77.73        77.73        77.73        77.73        77.73        77.73
           77.73        77.73        77.73        77.73        77.73        77.72        77.72        77.71        77.69        77.60
           77.38        77.09        76.79        76.68        76.65
 0  2      77.20        77.21        77.25        77.35        77.51        77.68        77.75        77.77        77.78        77.79
           77.80        77.80        77.80        77.80        77.81        77.81        77.81        77.81        77.81        77.81
           77.81        77.81        77.81        77.81        77.81        77.81        77.80        77.80        77.78        77.70
           77.47        77.09        76.62        76.59        76.62
 0  3      77.18        77.14        77.16        77.26        77.51        77.74        77.86        77.90        77.92        77.93
           77.94        77.95        77.95        77.96        77.96        77.96        77.97        77.97        77.97        77.97
           77.97        77.97        77.98        77.98        77.98        77.98        77.98        77.98        77.98        77.92
           77.70        77.19     0.0000E+00      76.45        76.62
 0  4      77.19     0.0000E+00   0.0000E+00   0.0000E+00      77.55        77.90        78.06        78.11        78.14        78.16
           78.17        78.18        78.19        78.20        78.20        78.21        78.21        78.21        78.22        78.22
           78.22        78.23        78.23        78.24        78.24        78.25        78.26        78.27        78.28        78.29
           78.25     0.0000E+00   0.0000E+00      76.60        76.80
 0  5      77.40     0.0000E+00   0.0000E+00   0.0000E+00      77.80        78.18        78.35        78.41        78.44        78.48
           78.48        78.49        78.50        78.51        78.52        78.53        78.53        78.54        78.54        78.54
           78.55        78.56        78.56        78.57        78.58        78.59        78.60        78.62        78.65        78.73
        0.0000E+00      78.13        77.27        77.16        77.17
 0  6      78.01        77.95        78.03        78.18        78.50        78.62        78.73        78.78        78.80        78.83
           78.84        78.86        78.88        78.90        78.91        78.91        78.92        78.93        78.94        78.95
           78.96        78.98     0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
           78.73        78.26        77.81        77.62        77.55
 0  7      78.53        78.58        78.75        78.97        79.19        78.92     0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
        0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
        0.0000E+00   0.0000E+00      79.00        78.99        78.99        78.99        78.98        78.97        78.96        78.89
           78.67        78.35        78.04        77.87        77.79
 0  8      78.75        78.84        79.07        79.33        79.59     0.0000E+00      79.03        79.03        79.03        79.02
           79.02        79.02        79.02        79.01        79.01        79.01        79.01        79.01        79.01        79.01
           79.01        79.00        79.00        79.00        78.99        78.99        78.98        78.97        78.95        78.87
           78.67        78.39        78.13        77.96        77.89
 0  9      78.86        78.97        79.23        79.51        79.81     0.0000E+00      79.06        79.05        79.04        79.04
           79.03        79.03        79.03        79.02        79.02        79.02        79.02        79.02        79.01        79.01
           79.01        79.01        79.00        79.00        78.99        78.99        78.98        78.97        78.94        78.86
           78.67        78.41        78.16        78.01        77.94
 0 10      78.94        79.06        79.35        79.65     0.0000E+00      79.08        79.07        79.06        79.05        79.05
           79.04        79.04        79.03        79.03        79.03        79.03        79.02        79.02        79.02        79.02
           79.02        79.01        79.01        79.00        79.00        78.99        78.98        78.97        78.94        78.86
           78.67        78.42        78.19        78.04        77.97
 0 11      79.00        79.12        79.43        79.74     0.0000E+00      79.12        79.09        79.07        79.06        79.05
           79.05        79.04        79.04        79.03        79.03        79.03        79.03        79.02        79.02        79.02
           79.02        79.02        79.01        79.00        79.00        78.99        78.98        78.97        78.94        78.85
           78.67        78.43        78.21        78.06        77.99
 0 12      79.05        79.18        79.51        79.83     0.0000E+00      79.16        79.10        79.08        79.07        79.06
           79.05        79.05        79.04        79.04        79.04        79.03        79.03        79.03        79.03        79.02
           79.02        79.02        79.01        79.01        79.00        78.99        78.98        78.97        78.94        78.85
           78.67        78.44        78.22        78.08        78.01
 0 13      79.10        79.24        79.59        79.92     0.0000E+00      79.20        79.12        79.09        79.08        79.07
           79.06        79.05        79.05        79.04        79.04        79.04        79.03        79.03        79.03        79.03
           79.02        79.02        79.02        79.01        79.00        79.00        78.98        78.97        78.94        78.85
           78.67        78.45        78.24        78.10        78.03
 0 14      79.14        79.29        79.65     0.0000E+00      79.97        79.22        79.13        79.10        79.08        79.07
           79.07        79.06        79.05        79.05        79.04        79.04        79.04        79.04        79.03        79.03
           79.03        79.02        79.02        79.01        79.00        79.00        78.99        78.97        78.94        78.85
           78.67        78.46        78.25        78.11        78.05
 0 15      79.17        79.32        79.69     0.0000E+00      79.95        79.23        79.13        79.10        79.09        79.08
           79.07       -20.94        79.05        79.05        79.05        79.04        79.04        79.04        79.03        79.03
           79.03        79.03        79.02        79.01        79.01        79.00        78.99        78.97        78.94        78.85
           78.67        78.46        78.26        78.12        78.06
 0 16      79.19        79.34        79.72     0.0000E+00      79.93        79.24        79.14        79.10        79.09        79.08
           79.07        79.06        79.06        79.05        79.05        79.04        79.04        79.04        79.04        79.03
           79.03        79.03        79.02        79.01        79.01        79.00        78.99        78.97        78.94        78.85
           78.68        78.46        78.27        78.13        78.07
 0 17      79.21        79.36        79.76     0.0000E+00      79.92        79.25        79.14        79.11        79.09        79.08
           79.07        79.07        79.06        79.05        79.05        79.05        79.04        79.04        79.04        79.03
           79.03        79.03        79.02        79.01        79.01        79.00        78.99        78.97        78.94        78.85
           78.68        78.47        78.27        78.14        78.07
 0 18      79.23        79.39        79.79     0.0000E+00      79.90        79.26        79.15        79.11        79.10        79.08
           79.08        79.07        79.06        79.05        87.05        79.05        79.05        79.04        79.04        79.04
           79.03        79.03        79.02        79.02        79.01        79.00        78.99        78.97        78.94        78.85
           78.68        78.47        78.28        78.15        78.08
 0 19     -0.7554       79.41        79.82     0.0000E+00      79.89        79.27        79.15        79.12        79.10        79.09
           79.08        79.07        79.06        87.06        79.05        79.05        79.05        79.04        79.04        79.04
           79.03        79.03        79.02        79.02        79.01        79.00        78.99        78.97        78.94        78.85
           78.68        78.47        78.28        78.15        78.09
 0 20      79.26        79.43        79.85     0.0000E+00      79.88        79.28        79.16        79.12        79.10        79.09
           79.08        79.07        79.06        79.06        79.05        79.05        79.05        79.05        79.04        79.04
           79.04        79.03        79.03        79.02        79.01        79.00        78.99        78.97        78.94        78.85
           78.68        78.48        78.29        78.16        78.10
 0 21      79.28        79.45        79.89     0.0000E+00      79.87        79.29        79.16        79.12        79.10        79.09
           79.08        79.07        79.07        79.06        79.06        79.05        79.05        79.05        79.04        79.04
           79.04        79.03        79.03        79.02        79.01        79.00        78.99        78.97        78.94        78.85
           78.68        78.48        78.30        78.17        78.10
 0 22      79.31        79.48        79.93     0.0000E+00      79.85        79.30        79.17        79.13        79.11        79.09
           79.09        79.08        79.07        79.06        79.06        79.06        79.05        79.05        79.05        79.04
           79.04        79.04        79.03        79.02        79.01        79.00        78.99        78.97        78.94        78.85
           78.68        78.49        78.30        78.18        78.11
 0 23      79.34        79.52     0.0000E+00      79.98        79.83        79.31        79.17        79.13        79.11        79.10
           79.09        79.08        79.07        79.07        79.06        79.06        79.06        79.05        79.05        79.05
           79.04        79.04        79.03        79.02        79.01        79.01        78.99        78.98        78.94        78.85
           78.68        78.49        78.31        78.19        78.13
 0 24      79.39        79.57     0.0000E+00      79.97        79.81        79.32        79.18        79.14        79.12        79.11
           79.10        79.09        79.08        79.07        79.07        79.06        79.06        79.06        87.05        79.05
           79.05        79.04        79.03        79.03        79.02        79.01        79.00        78.98        78.94        78.85
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	78.69	78.80	78.33	78.21	78.15					
0 25	79.43	79.62	0.0000E+00	79.95	79.78	79.34	79.19	79.15	79.13	79.11
	79.10	79.09	79.08	79.08	79.07	79.07	79.06	79.06	79.06	79.05
	79.05	79.05	79.04	79.03	79.02	79.01	79.00	78.98	78.94	78.85
	78.69	78.51	78.34	78.22	78.16					
0 26	78.48	79.66	0.0000E+00	79.93	79.77	79.35	79.20	79.15	79.13	79.12
	79.11	79.10	79.09	79.08	79.08	79.07	79.07	79.06	79.06	79.06
	79.05	79.05	79.04	79.03	79.02	79.01	79.00	78.98	78.94	78.85
	78.69	78.52	78.35	78.24	78.18					
0 27	79.54	79.73	0.0000E+00	79.91	79.74	79.36	79.21	79.16	79.14	79.13
	79.11	79.10	79.09	79.09	79.08	79.08	79.07	79.07	79.07	79.06
	79.06	79.05	79.05	79.04	79.03	79.02	79.00	78.99	78.95	78.85
	78.70	78.53	78.37	78.26	78.21					
0 28	79.62	79.82	0.0000E+00	79.88	79.71	79.37	79.23	79.18	79.15	79.14
	79.12	79.11	79.10	79.09	79.09	79.09	79.08	79.08	79.07	79.07
	78.07	79.06	79.05	79.04	79.03	79.02	79.01	78.99	78.95	78.86
	78.71	78.55	78.40	78.29	78.24					
0 29	79.76	0.0000E+00	79.94	79.83	79.66	79.39	79.25	79.19	79.17	87.15
	79.14	79.13	79.12	79.11	79.10	79.10	79.10	79.09	79.09	79.08
	79.08	79.07	79.07	79.06	79.04	79.03	79.02	79.00	78.96	78.86
	78.72	78.58	78.44	78.35	78.30					
0 30	0.0000E+00	79.92	79.84	79.73	79.58	79.39	79.27	79.22	79.20	79.18
	79.17	79.16	79.14	79.14	79.13	79.13	79.12	79.12	79.11	79.11
	79.10	79.10	79.09	79.08	79.07	79.06	79.04	79.02	78.98	78.89
	78.76	78.64	78.54	78.46	78.42					
0 31	79.85	79.80	79.73	79.64	79.52	79.38	79.27	79.23	79.21	79.19
	79.18	79.17	79.16	79.15	79.15	79.14	79.14	79.14	79.13	79.13
	79.12	79.12	79.11	79.10	79.09	79.08	79.07	79.05	79.01	78.92
	78.81	78.71	78.63	78.57	-21.46					
0 32	79.74	79.71	79.65	79.57	79.47	79.36	79.27	79.23	79.21	79.20
	79.19	79.18	79.17	79.16	79.16	79.15	79.15	79.15	79.14	79.14
	79.14	79.13	79.12	79.12	79.11	79.10	79.08	79.07	79.03	78.95
	78.86	78.77	78.70	78.65	78.62					
0 33	79.67	79.65	79.60	79.53	79.44	79.34	79.26	79.23	79.21	79.20
	79.19	79.18	79.17	79.17	79.16	79.16	79.16	79.15	79.15	79.15
	79.14	79.14	79.13	79.12	79.12	79.11	79.09	79.08	79.05	78.98
	78.89	78.81	78.75	78.71	78.69					
0 34	79.63	79.60	79.56	79.50	79.42	79.33	79.26	79.23	79.21	79.20
	79.19	79.18	79.18	79.17	79.17	79.16	79.16	79.16	79.15	79.15
	79.15	79.14	79.14	79.13	79.12	79.11	79.10	79.09	79.06	78.99
	78.91	78.84	78.78	78.74	78.72					
0 35	79.61	79.58	79.54	79.48	79.41	79.32	79.26	79.23	79.21	79.20
	79.19	79.18	79.18	79.17	79.17	79.16	79.16	79.16	79.16	79.15
	79.15	79.15	79.14	79.13	79.12	79.12	79.11	79.09	79.06	79.00
	78.92	78.85	78.80	78.76	78.74					

0

VOLUMETRIC BUDGET FOR ENTIRE MODEL AT END OF TIME STEP 20 IN STRESS PERIOD 1

CUMULATIVE VOLUMES	L**3	RATES FOR THIS TIME STEP	L**3/T
IN:		IN:	
STORAGE =	0.00000E+00	STORAGE =	0.00000E+00
CONSTANT HEAD =	5351.6	CONSTANT HEAD =	0.30969E-02
TOTAL IN =	5351.6	TOTAL IN =	0.30969E-02
OUT:		OUT:	
STORAGE =	0.00000E+00	STORAGE =	0.00000E+00
CONSTANT HEAD =	5352.5	CONSTANT HEAD =	0.30975E-02
TOTAL OUT =	5352.5	TOTAL OUT =	0.30975E-02
IN - OUT =	-0.93018	IN - OUT =	-0.62981E-06
PERCENT DISCREPANCY =	-0.02	PERCENT DISCREPANCY =	-0.02

0

TIME SUMMARY AT END OF TIME STEP 20 IN STRESS PERIOD 1

	SECONDS	MINUTES	HOURS	DAYS	YEARS
TIME STEP LENGTH	86400.0	1440.00	24.0000	1.00000	0.273785E-02
STRESS PERIOD TIME	0.172800E+07	28800.0	480.000	20.0000	0.547570E-01
TOTAL SIMULATION TIME	0.172800E+07	28800.0	480.000	20.0000	0.547570E-01

1

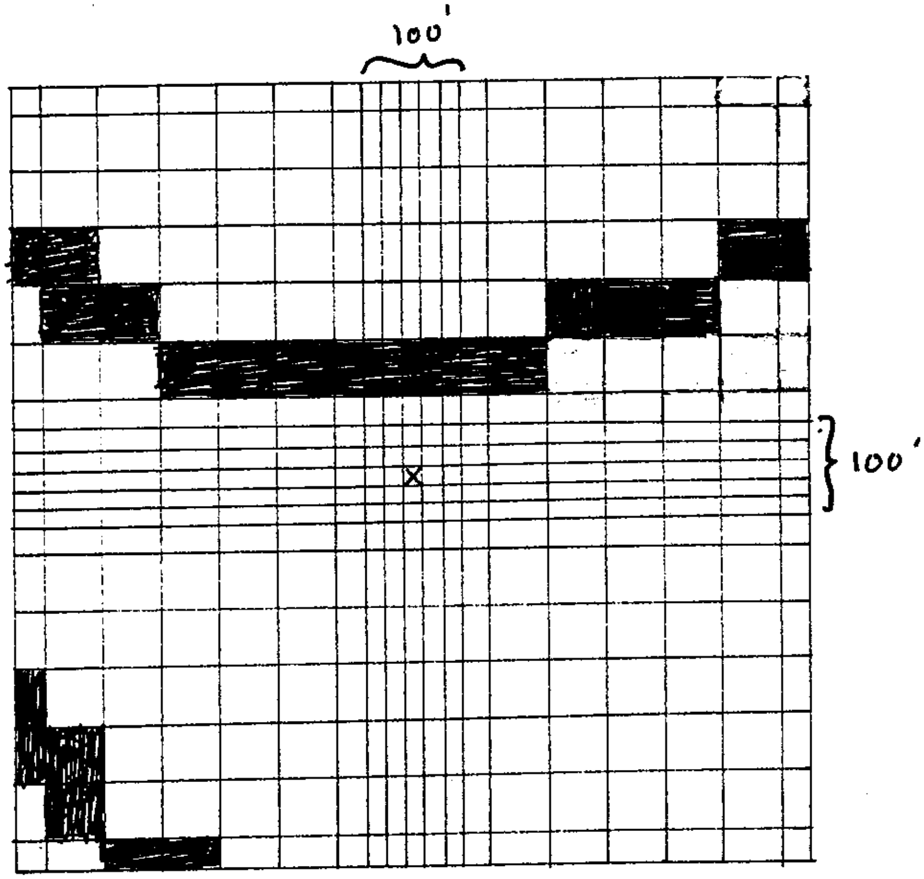
MODFLOW Simulation and Actual Head Comparisons including Simulated Discharge Drawdowns
120 FEET NORTH OF 4S/4D (proposed CAP well RW-5)
K=1.5e-2 ft/min Q=7gpm
b = 33 to 60 feet

CELL NUMBER (i,j)	ACTUAL HEAD	SIMULATED STEADY-STATE HEAD	HEAD DIFFERENCE	SIMULATED PUMPING HEAD	SIMULATED DRAWDOWN	RADIAL DISTANCE	CONSTANT HEAD CELL
1,1	867.5	882.6	15.1	882.6	0	560	NO
1,35	902	899.1	-2.9	899.1	0	560	NO
5,5	875	890.2	15.2	890.2	0	240	NO
5,31	900	899.4	-0.6	900	0.6	240	YES
8,8	883	892.5	9.5	892.3	-0.2	65	NO
8,28	887.5	896.1	8.6	895.9	-0.2	65	NO
10,10	885	893	8	892.6	-0.4	38	NO
10,26	887	894.9	7.9	894.6	-0.3	38	NO
14,14	886	893.3	7.3	892.7	-0.6	12	NO
14,22	886.5	893.8	7.3	893.2	-0.6	12	NO
18,18	886.4	893.3	6.9	892.1	-1.2	0	NO
22,14	886	892.9	6.9	892.3	-0.6	12	NO
22,22	886.4	893.4	7	892.8	-0.6	12	NO
26,10	885.8	891.9	6.1	891.6	-0.3	38	NO
26,26	887.4	893.5	6.1	893.1	-0.4	38	NO
28,8	885.5	891.1	5.6	890.8	-0.3	65	NO
28,28	887.6	893.5	5.9	893.2	-0.3	65	NO
31,5	888.2	885.6	-2.6	885.5	-0.1	240	NO
31,31	892.5	893.1	0.6	893	-0.1	240	NO
35,1	872.4	875.3	2.9	875.3	0	560	NO
35,35	898	892.9	-5.1	892.8	-0.1	560	NO

NOTES:
1. Cell Number - row then column for (i,j) notation.
2. Actual Head - interpolated from 8/21/91 water table map at block centered (i,j) location.
3. Simulated Steady-State Head - MODFLOW Simulated Head without discharge stress from pumping well.
4. Head Difference - Actual Head minus MODFLOW Simulated Steady-State Head.
5. Simulated Pumping Head - MODFLOW Simulated Head with discharge stress from pumping well located at (i,j)=(19,19).
6. Simulated Drawdown - MODFLOW Simulated Pumping Head minus MODFLOW Simulated Steady-State Head.
7. Radial Distance - (i,j) block centered distance from discharge (i,j) cell.
8. Constant Head Cell - cell that corresponds to known hydrogeologic constant head boundaries such as a stream or creek.

~ 120 North of 4S/4D

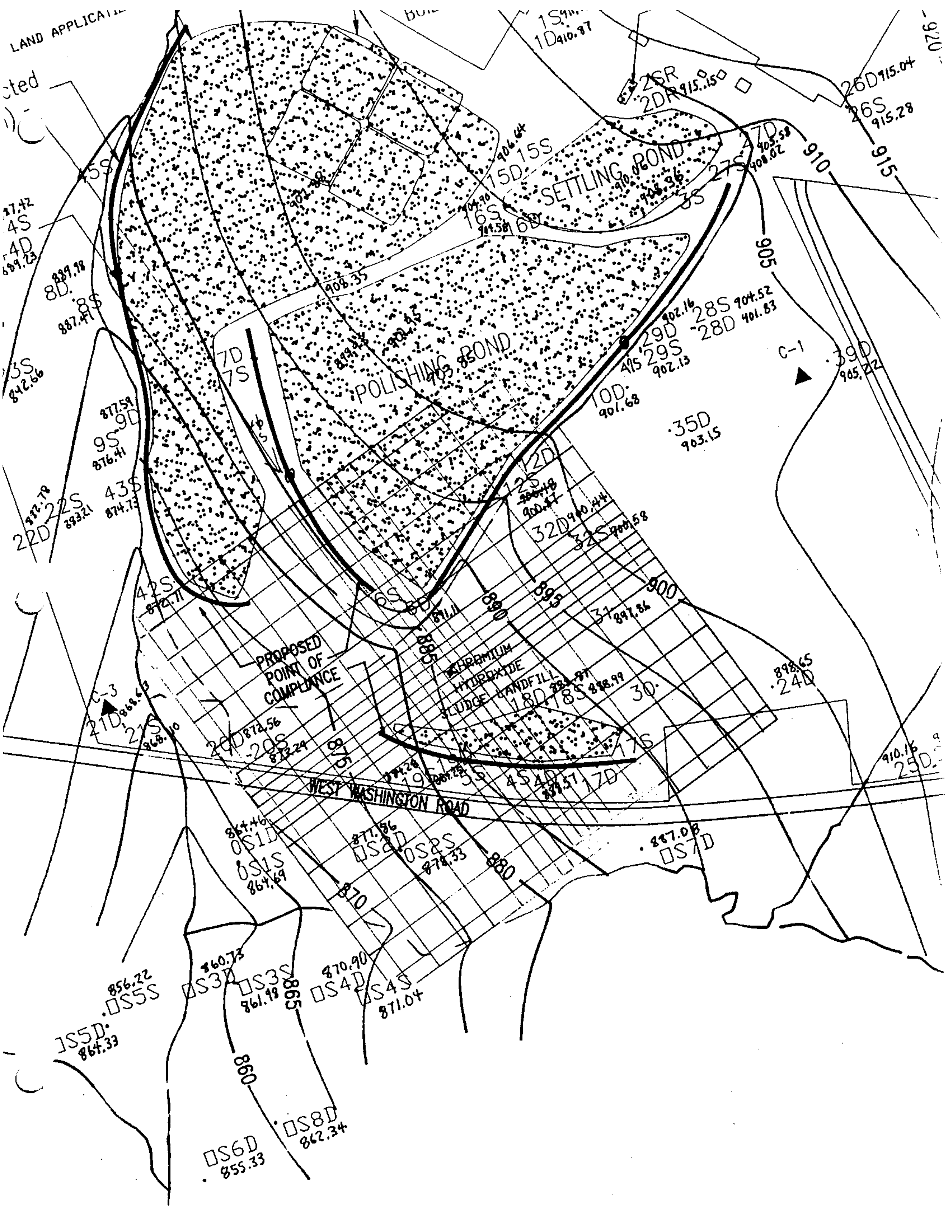
NOTE: FINE DISCRETISATION OF GRID IN THE CENTRAL 100 FEET ZONE NOT DRAWN FOR CLARITY. THIS ZONE WAS DISCRETISED FROM 10 FEET TO 2 FEET.



⊠ - PUMPING WELL

■ - CONSTANT HEAD BOUNDARY

□ - VARIABLE HEADS



SETTLING POND
POLISHING POND
PROPOSED POINT OF COMPLIANCE
CHROMIUM HYDROXIDE SLUDGE LANDFILL
WEST WASHINGTON ROAD
C-1
C-3
920
915
910
905
900
895
890
885
880
875
870
865
860
26D 915.04
26S 915.28
2SR
2DR 915.15
27D 908.58
27S 908.02
15D
15S
16S
6D
908.35
28S 904.52
28D 901.83
29D
29S 902.13
10D 901.68
39D 905.22
35D 903.15
12D
12S
32D
32S 900.58
31 897.86
30
24D 898.65
18D
18S 888.99
17S
17D
25D 910.16
7D
7S
8D
8S 887.41
9D 877.59
9S 876.41
22S 883.21
22D
43S 874.73
42S 872.71
21D
21S
20D 872.56
20S 873.24
0S1D 864.46
0S1S 864.69
0S2D 871.56
0S2S 878.33
0S7D 887.08
0S5S 856.22
0S3D 860.73
0S3S 861.98
0S4D 870.90
0S4S 871.04
0S5D 864.33
0S8D 862.34
0S6D 855.33

120 FT N of 4S
with PUMPING WELL

```
1                     U.S. GEOLOGICAL SURVEY MODULAR FINITE-DIFFERENCE GROUND-WATER MODEL
0BONMOD2 1 layer, 35 rows, 35 columns, 1 well                                   unconfined, impermeable bedrock 120N of 4S
    1 LAYERS          35 ROWS          35 COLUMNS
   1 STRESS PERIOD(S) IN SIMULATION
 MODEL TIME UNIT IS SECONDS
0I/O UNITS:
 ELEMENT OF IUNIT:  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
         I/O UNIT: 11 12  0  0  0  0  0  0 19  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0BAS1 -- BASIC MODEL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT  1
 ARRAYS RHS AND BUFF WILL SHARE MEMORY.
 START HEAD WILL BE SAVED
    11099 ELEMENTS IN X ARRAY ARE USED BY BAS
    11099 ELEMENTS OF X ARRAY USED OUT OF    30000
0BCF1 -- BLOCK-CENTERED FLOW PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 11
 STEADY-STATE SIMULATION
      LAYER  AQUIFER TYPE
      -------------------
        1         1
     2451 ELEMENTS IN X ARRAY ARE USED BY BCF
    13550 ELEMENTS OF X ARRAY USED OUT OF    30000
0WEL1 -- WELL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM 12
 MAXIMUM OF     1 WELLS
        4 ELEMENTS IN X ARRAY ARE USED FOR WELLS
    13554 ELEMENTS OF X ARRAY USED OUT OF    30000
0SIP1 -- STRONGLY IMPLICIT PROCEDURE SOLUTION PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 19
 MAXIMUM OF 100 ITERATIONS ALLOWED FOR CLOSURE
   5 ITERATION PARAMETERS
     5305 ELEMENTS IN X ARRAY ARE USED BY SIP
    18859 ELEMENTS OF X ARRAY USED OUT OF    30000
1BONMOD2 1 layer, 35 rows, 35 columns, 0 well                                   unconfined, impermeable bedrock 120N of 4S
0
```

k = 0.015 feet/minute
or
1.5×10^{-2} feet/minute

Q ≈ 7 gpm.
or 0.016 $feet^3$/second

b = 33' - 60'

BOUNDARY ARRAY FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35I2)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
0 1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 4	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	-1
0 5	1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	-1	-1	1	1
0 6	1	1	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	1	1	1	1	1
0 7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 32	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 33	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 34	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 35	1	1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					

893.3 well
893.3 -

1 1 1 1 1
0AQUIFER HEAD WILL BE SET TO 999.90 AT ALL NO-FLOW NODES (IBOUND=0).
0

INITIAL HEAD FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35F5.0)

	1 16 31	2 17 32	3 18 33	4 19 34	5 20 35	6 21	7 22	8 23	9 24	10 25	11 26	12 27	13 28	14 29	15 30
0 1	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 2	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 3	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 4	870.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	900.0	900.0										
0 5	880.0	880.0	890.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	900.0	900.0	900.0	880.0	880.0										
0 6	880.0	880.0	880.0	890.0	890.0	890.0	891.0	892.0	894.0	895.0	895.0	895.0	895.0	896.0	896.0
	896.0	897.0	897.0	898.0	898.0	899.0	899.0	899.0	900.0	880.0	900.0	900.0	900.0	900.0	900.0
	880.0	880.0	880.0	880.0	880.0										
0 7	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 8	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 9	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 10	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 11	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 12	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 13	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 14	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 15	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 16	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 17	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 18	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 19	800.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 20	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 21	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 22	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 23	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 24	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	888.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 25	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 26	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 27	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 28	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 29	880.0	888.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 30	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 31	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 32	874.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										

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0 33    874.0   875.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0
0 34    880.0   875.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0
0 35    880.0   880.0   877.0   879.0   879.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0
0DEFAULT OUTPUT CONTROL -- THE FOLLOWING OUTPUT COMES AT THE END OF EACH STRESS PERIOD:
 TOTAL VOLUMETRIC BUDGET
          HEAD
          DRAWDOWN
0                                              COLUMN TO ROW ANISOTROPY =   1.000000
0


                                          DELR WILL BE READ ON UNIT 11 USING FORMAT:           (35F4.0)
                              ------------------------------------------------------------------------------

   60.000        60.000        60.000        60.000        60.000        60.000        30.000        10.000        10.000        5.0000
   5.0000        5.0000        5.0000        3.0000        2.0000        2.0000        2.0000        2.0000        2.0000        2.0000
   2.0000        3.0000        5.0000        5.0000        5.0000        5.0000        10.000        10.000        30.000        60.000
   60.000        60.000        60.000        60.000        60.000
0


                                          DELC WILL BE READ ON UNIT 11 USING FORMAT:           (35F4.0)
                              ------------------------------------------------------------------------------

   60.000        60.000        60.000        60.000        60.000        60.000        30.000        10.000        10.000        5.0000
   5.0000        5.0000        5.0000        3.0000        2.0000        2.0000        2.0000        2.0000        2.0000        2.0000
   2.0000        3.0000        5.0000        5.0000        5.0000        5.0000        10.000        10.000        30.000        60.000
   60.000        60.000        60.000        60.000        60.000
0                                                HYD. COND. ALONG ROWS =  0.2500000E-03 FOR LAYER  1
0                                                               BOTTOM =   840.0000     FOR LAYER  1
0


                                                    SOLUTION BY THE STRONGLY IMPLICIT PROCEDURE
                                                    -------------------------------------------
0                                           MAXIMUM ITERATIONS ALLOWED FOR CLOSURE =       100
                                                           ACCELERATION PARAMETER =      1.0000
                                                HEAD CHANGE CRITERION FOR CLOSURE =    0.10000E-02
                                                SIP HEAD CHANGE PRINTOUT INTERVAL =        1
0
   5 ITERATION PARAMETERS CALCULATED FROM SPECIFIED WSEED = 0.00100000 :

         0.0000000E+00  0.8221720E+00  0.9683772E+00  0.9943766E+00  0.9990000E+00
1                                               STRESS PERIOD NO.   1, LENGTH =    1728000.
                                                ----------------------------------------------

                                                NUMBER OF TIME STEPS =     20

                                                 MULTIPLIER FOR DELT =     1.000

                                              INITIAL TIME STEP SIZE =    86400.00

0             1 WELLS
                                            LAYER    ROW    COL    STRESS RATE   WELL NO.
                                            ----------------------------------------------
                                              1       18     18    -0.16000E-01       1
0**********NODE   1  19   1 (LAYER,ROW,COL) WENT DRY AT ITERATION =  1  TIME STEP =  1  STRESS PERIOD =  1
0
   27 ITERATIONS FOR TIME STEP   1 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ----------------------------------------------------------------------------------------------------------------------------------
    16.03      (  1,  5, 34)   11.47      (  1,  1, 35)   5.165      (  1,  3, 10)   7.377      (  1,  1, 19)   9.259      (  1, 19, 18)
  -0.9910      (  1, 18,  1)  -1.224      (  1, 28,  1) -0.7888      (  1, 18,  1) -0.9903      (  1, 20,  1) -0.7871      (  1, 25, 10)
  -0.1974      (  1, 29, 14)  0.1559      (  1, 25, 10) -0.1603      (  1, 28, 22)  0.3187      (  1, 18, 16)  0.1532      (  1, 24, 25)
   0.3560E-01 (  1, 21,  7)  0.2559E-01 (  1, 28,  1) -0.5767E-01 (  1, 18, 16) -0.6913E-01 (  1, 15, 15) -0.6052E-01 (  1, 27, 14)
  -0.9655E-02 (  1, 23, 12) -0.1131E-01 (  1, 24, 11)  0.6158E-02 (  1, 23, 23)  0.9609E-02 (  1, 25, 21)  0.7414E-02 (  1, 20, 13)
  -0.1156E-02 (  1, 13,  8) -0.9709E-03 (  1, 13,  9)
0
    1 ITERATIONS FOR TIME STEP   2 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ----------------------------------------------------------------------------------------------------------------------------------
   0.3306E-03 (  1, 32, 11)
0
    1 ITERATIONS FOR TIME STEP   3 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ----------------------------------------------------------------------------------------------------------------------------------
   0.2523E-03 (  1, 32,  9)
0
    1 ITERATIONS FOR TIME STEP   4 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ----------------------------------------------------------------------------------------------------------------------------------
   0.2056E-03 (  1, 33,  8)
0
    1 ITERATIONS FOR TIME STEP   5 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ----------------------------------------------------------------------------------------------------------------------------------
   0.1748E-03 (  1, 33,  8)
0
    1 ITERATIONS FOR TIME STEP   6 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ----------------------------------------------------------------------------------------------------------------------------------
   0.1466E-03 (  1, 33,  8)
0
    1 ITERATIONS FOR TIME STEP   7 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  0.1251E-03 (  1, 33,  8)
0
    1 ITERATIONS FOR TIME STEP   8 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 -----------------------------------------------------------------------------------------------------------------------------------
  0.1068E-03 (  1, 34,  9)
0
    1 ITERATIONS FOR TIME STEP   9 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 -----------------------------------------------------------------------------------------------------------------------------------
  0.9158E-04 (  1, 34,  9)
0
    1 ITERATIONS FOR TIME STEP  10 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 -----------------------------------------------------------------------------------------------------------------------------------
  0.7889E-04 (  1, 34, 10)
0
    1 ITERATIONS FOR TIME STEP  11 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 -----------------------------------------------------------------------------------------------------------------------------------
  0.6811E-04 (  1, 34, 10)
0
    1 ITERATIONS FOR TIME STEP  12 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 -----------------------------------------------------------------------------------------------------------------------------------
  0.5863E-04 (  1, 34, 11)
0
    1 ITERATIONS FOR TIME STEP  13 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 -----------------------------------------------------------------------------------------------------------------------------------
  0.5083E-04 (  1, 34, 11)
0
    1 ITERATIONS FOR TIME STEP  14 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 -----------------------------------------------------------------------------------------------------------------------------------
  0.4410E-04 (  1, 34, 11)
0
    1 ITERATIONS FOR TIME STEP  15 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 -----------------------------------------------------------------------------------------------------------------------------------
  0.3791E-04 (  1, 34, 15)
0
    1 ITERATIONS FOR TIME STEP  16 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 -----------------------------------------------------------------------------------------------------------------------------------
 -0.3349E-04 (  1, 25, 25)
0
    1 ITERATIONS FOR TIME STEP  17 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 -----------------------------------------------------------------------------------------------------------------------------------
 -0.3015E-04 (  1, 25, 25)
0
    1 ITERATIONS FOR TIME STEP  18 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 -----------------------------------------------------------------------------------------------------------------------------------
 -0.2724E-04 (  1, 25, 24)
0
    1 ITERATIONS FOR TIME STEP  19 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 -----------------------------------------------------------------------------------------------------------------------------------
 -0.2467E-04 (  1, 25, 24)
0
    1 ITERATIONS FOR TIME STEP  20 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 -----------------------------------------------------------------------------------------------------------------------------------
 -0.2241E-04 (  1, 25, 24)
0
1                    HEAD IN LAYER  1 AT END OF TIME STEP 20 IN STRESS PERIOD  1
           ---------------------------------------------------------------------------

             1          2          3          4          5          6          7          8          9         10
            11         12         13         14         15         16         17         18         19         20
            21         22         23         24         25         26         27         28         29         30
            31         32         33         34         35
 ..........................................................................................................................
0  1     882.6      883.8      885.6      887.6      889.5      891.2      892.5      893.0      893.3      893.4
         893.6      893.7      893.8      893.9      894.0      894.0      894.1      894.1      894.2      894.2
         894.3      894.3      894.4      894.5      894.6      894.8      894.9      895.1      895.6      896.4
         897.4      898.1      898.6      898.9      899.1
0  2     881.3      883.1      885.5      887.6      889.5      891.3      892.6      893.1      893.4      893.6
         893.7      893.8      893.9      894.0      894.1      894.2      894.2      894.3      894.3      894.4
         894.4      894.5      894.6      894.7      894.8      894.9      895.1      895.3      895.8      896.6
         897.6      898.3      898.8      899.1      899.3
0  3     878.1      881.7      885.3      887.8      889.7      891.4      892.7      893.3      893.6      893.8
         893.9      894.1      894.2      894.3      894.4      894.4      894.5      894.5      894.6      894.6
         894.7      894.8      894.9      895.0      895.1      895.2      895.4      895.7      896.1      897.1
         898.0      898.7      899.1      899.5      899.6
0  4     870.0      880.0      886.1      888.4      890.0      891.5      892.8      893.5      893.8      894.0
         894.2      894.4      894.5      894.7      894.7      894.8      894.9      894.9      895.0      895.0
         895.1      895.2      895.3      895.5      895.6      895.8      896.0      896.3      896.8      897.8
         898.8      899.3      899.6      900.0      900.0
0  5     877.5      880.0      890.0      889.7      890.2      891.2      892.6      893.5      893.9      894.3
         894.5      894.7      894.9      895.1      895.2      895.3      895.4      895.5      895.6      895.7
         895.7      895.8      896.0      896.1      896.3      896.5      896.9      897.2      897.9      898.8
         900.0      900.0      900.0      899.5      899.3
```

0 6	881.3	883.3	887.5	890.0	890.0	890.0	891.0	892.0	894.0	895.0
	895.0	895.0	895.0	896.0	896.0	896.0	897.0	897.0	898.0	898.0
	899.0	899.0	899.0	900.0	880.0	900.0	900.0	900.0	900.0	900.0
	899.1	898.9	898.8	898.6	898.5					
0 7	882.5	883.9	886.5	888.5	889.3	890.2	891.6	892.5	893.1	893.5
	893.7	894.0	894.2	894.4	894.6	894.7	894.8	894.9	895.0	895.1
	895.1	895.2	895.4	895.5	895.6	895.9	896.3	896.8	897.4	898.0
	898.0	897.9	897.9	897.9	897.9					
0 8	882.8	884.0	886.1	888.0	889.1	890.1	891.5	892.3	892.7	893.0
	893.2	893.5	893.7	893.8	893.9	894.0	894.1	894.2	894.3	894.3
	894.4	894.5	894.7	894.8	895.0	895.2	895.5	895.9	896.5	897.2
	897.4	897.5	897.6	897.6	897.6					
0 9	882.9	884.0	886.0	887.7	888.9	890.1	891.4	892.1	892.5	892.8
	893.0	893.2	893.4	893.5	893.6	893.7	893.8	893.9	893.9	894.0
	894.1	894.2	894.3	894.5	894.7	894.9	895.1	895.5	896.0	896.9
	897.2	897.3	897.4	897.4	897.4					
0 10	883.0	884.0	885.8	887.6	888.8	890.0	891.3	892.0	892.4	892.6
	892.8	893.0	893.2	893.3	893.4	893.5	893.5	893.6	893.7	893.8
	893.8	893.9	894.1	894.2	894.4	894.6	894.9	895.2	895.8	896.6
	897.0	897.1	897.2	897.3	897.3					
0 11	883.0	883.9	885.8	887.5	888.7	890.0	891.3	891.9	892.3	892.5
	892.7	892.9	893.0	893.1	893.2	893.3	893.4	893.4	893.5	893.6
	893.7	893.7	893.9	894.1	894.3	894.4	894.7	895.0	895.6	896.4
	896.8	897.0	897.2	897.2	897.2					
0 12	883.0	883.9	885.7	887.4	888.6	889.9	891.2	891.9	892.2	892.4
	892.6	892.7	892.9	893.0	893.1	893.1	893.2	893.3	893.3	893.4
	893.5	893.6	893.7	893.9	894.1	894.3	894.5	894.8	895.4	896.3
	896.7	896.9	897.1	897.1	897.1					
0 13	883.0	883.9	885.6	887.3	888.6	889.9	891.2	891.8	892.1	892.3
	892.4	892.6	892.7	892.8	892.9	892.9	893.0	893.1	893.1	893.2
	893.3	893.4	893.5	893.7	893.9	894.1	894.4	894.7	895.2	896.1
	896.6	896.8	897.0	897.0	897.1					
0 14	883.0	883.8	885.5	887.2	888.5	889.8	891.1	891.7	892.0	892.2
	892.3	892.5	892.6	892.7	892.7	892.8	892.8	892.9	893.0	893.0
	893.1	893.2	893.4	893.6	893.8	894.0	894.2	894.5	895.1	896.0
	896.5	896.7	896.9	897.0	897.0					
0 15	883.0	883.8	885.5	887.1	888.5	889.8	891.1	891.7	892.0	892.2
	892.3	892.4	892.5	892.6	892.6	892.7	892.7	892.8	892.8	892.9
	893.0	893.1	893.3	893.5	893.7	893.9	894.2	894.5	895.0	895.9
	896.4	896.7	896.9	896.9	897.0					
0 16	883.0	883.8	885.5	887.1	888.4	889.8	891.0	891.6	891.9	892.1
	892.2	892.4	892.5	892.5	892.6	892.6	892.6	892.6	892.7	892.8
	892.9	893.1	893.3	893.5	893.7	893.8	894.1	894.4	894.9	895.8
	896.4	896.7	896.8	896.9	896.9					
0 17	883.0	883.8	885.4	887.0	888.4	889.8	891.0	891.6	891.9	892.1
	892.2	892.3	892.4	892.5	892.5	892.5	892.5	892.4	892.6	892.7
	892.9	893.0	893.2	893.4	893.6	893.8	894.0	894.3	894.9	895.8
	896.3	896.6	896.8	896.9	896.9					
0 18	883.0	883.8	885.4	887.0	888.4	889.7	891.0	891.6	891.8	892.0
	892.2	892.3	892.4	892.4	892.4	892.4	892.3	892.1	892.5	892.7
	892.8	893.0	893.1	893.4	893.6	893.7	894.0	894.3	894.8	895.7
	896.3	896.6	896.7	896.8	896.9					
0 19	1.0000E+30	883.7	885.4	887.0	888.3	889.7	891.0	891.5	891.8	892.0
	892.1	892.2	892.3	892.4	892.4	892.4	892.4	892.4	892.5	892.6
	892.8	892.9	893.1	893.3	893.5	893.7	893.9	894.2	894.8	895.7
	896.2	896.5	896.7	896.8	896.8					
0 20	882.4	883.7	885.3	886.9	888.3	889.7	890.9	891.5	891.8	892.0
	892.1	892.2	892.3	892.4	892.4	892.4	892.4	892.4	892.5	892.6
	892.7	892.9	893.1	893.3	893.4	893.6	893.9	894.2	894.7	895.6
	896.2	896.5	896.7	896.8	896.8					
0 21	882.4	883.7	885.3	886.9	888.3	889.7	890.9	891.5	891.7	891.9
	892.0	892.2	892.3	892.3	892.4	892.4	892.4	892.5	892.6	892.6
	892.7	892.8	893.0	893.2	893.4	893.6	893.8	894.1	894.6	895.5
	896.1	896.4	896.6	896.7	896.8					
0 22	882.4	883.7	885.2	886.8	888.2	889.6	890.9	891.4	891.7	891.9
	892.0	892.1	892.2	892.3	892.3	892.4	892.4	892.5	892.6	892.6
	892.7	892.8	893.0	893.2	893.3	893.5	893.7	894.0	894.6	895.5
	896.1	896.4	896.6	896.7	896.7					
0 23	882.4	883.6	885.2	886.8	888.2	889.6	890.8	891.4	891.6	891.8
	891.9	892.1	892.2	892.3	892.3	892.4	892.4	892.5	892.5	892.6
	892.7	892.8	892.9	893.1	893.2	893.4	893.6	893.9	894.5	895.3
	896.0	896.3	896.5	896.6	896.7					
0 24	882.4	883.6	885.1	886.7	888.1	889.5	890.7	891.3	891.5	891.7
	891.9	892.0	892.1	892.2	892.3	892.3	892.4	892.4	892.5	892.5
	892.6	892.7	892.8	893.0	893.1	893.3	893.5	893.8	894.3	895.2
	895.8	896.2	896.4	896.5	896.6					
0 25	882.4	883.5	885.0	886.6	888.0	889.4	890.7	891.2	891.5	891.6
	891.8	891.9	892.0	892.1	892.2	892.2	892.3	892.4	892.4	892.5
	892.5	892.6	892.7	892.9	893.0	893.2	893.4	893.7	894.2	895.1
	895.7	896.1	896.3	896.5	896.5					
0 26	882.3	883.4	884.9	886.5	887.9	889.4	890.6	891.1	891.4	891.6
	891.7	891.8	892.0	892.1	892.1	892.2	892.2	892.3	892.3	892.4
	892.5	892.5	892.6	892.8	892.9	893.1	893.3	893.6	894.1	894.9
	895.6	896.0	896.3	896.4	896.4					
0 27	882.3	883.3	884.8	886.3	887.8	889.3	890.5	891.0	891.3	891.4
	891.6	891.7	891.8	891.9	892.0	892.1	892.1	892.2	892.2	892.3
	892.3	892.4	892.5	892.7	892.8	892.9	893.1	893.4	893.9	894.8
	895.4	895.9	896.1	896.3	896.3					
0 28	882.1	883.1	884.6	886.2	887.6	889.1	890.3	890.8	891.1	891.3
	891.4	891.5	891.7	891.8	891.8	891.9	892.0	892.0	892.1	892.1
	892.2	892.2	892.3	892.5	892.6	892.7	892.9	893.2	893.6	894.5
	895.2	895.7	895.9	896.1	896.2					
0 29	881.8	882.8	884.2	885.8	887.3	888.8	890.0	890.5	890.8	891.0
	891.1	891.2	891.3	891.4	891.5	891.6	891.6	891.7	891.7	891.8
	891.8	891.9	892.0	892.1	892.2	892.3	892.5	892.7	893.2	894.0
	894.8	895.3	895.6	895.8	895.9					
0 30	880.8	881.8	883.3	884.9	886.5	888.1	889.3	889.8	890.0	890.2
	890.4	890.5	890.6	890.7	890.7	890.8	890.8	890.9	890.9	891.0
	891.0	891.1	891.2	891.3	891.4	891.5	891.7	891.9	892.3	893.1
	893.9	894.5	894.9	895.1	895.2					
0 31	878.3	879.9	881.7	883.7	885.5	887.2	888.4	888.9	889.1	889.3
	889.4	889.6	889.7	889.8	889.8	889.9	889.9	890.0	890.0	890.0
	890.1	890.1	890.2	890.3	890.5	890.6	890.7	890.9	891.3	892.1
	893.0	893.6	894.0	894.3	894.5					
0 32	874.0	877.3	880.1	882.4	884.4	886.3	887.5	888.1	888.3	888.5
	888.6	888.7	888.9	889.0	889.0	889.1	889.1	889.2	889.2	889.2
	889.3	889.3	889.4	889.5	889.7	889.8	889.9	890.1	890.5	891.3
	892.2	892.9	893.4	893.7	893.8					

0 33	874.0	875.0	878.6	881.2	883.5	885.5	886.8	887.4	887.6	887.8
	888.0	888.1	888.2	888.3	888.4	888.4	888.5	888.5	888.6	888.6
	888.7	888.7	888.8	888.9	889.0	889.1	889.3	889.5	889.9	890.8
	891.6	892.3	892.8	893.2	893.3					
0 34	874.8	875.0	877.8	880.2	882.7	884.9	886.3	886.9	887.2	887.4
	887.5	887.6	887.8	887.9	887.9	888.0	888.0	888.1	888.1	888.2
	888.2	888.3	888.4	888.5	888.6	888.7	888.9	889.1	889.5	890.4
	891.3	892.0	892.5	892.8	893.0					
0 35	875.3	875.8	877.0	879.0	882.2	884.6	886.0	886.6	886.9	887.1
	887.2	887.4	887.5	887.6	887.7	887.7	887.8	887.8	887.9	887.9
	888.0	888.0	888.1	888.3	888.4	888.5	888.7	888.9	889.3	890.1
	891.1	891.8	892.3	892.7	892.8					

1 DRAWDOWN IN LAYER 1 AT END OF TIME STEP 20 IN STRESS PERIOD 1

	1 11 21 31	2 12 22 32	3 13 23 33	4 14 24 34	5 15 25 35	6 16 26	7 17 27	8 18 28	9 19 29	10 20 30
0 1	-2.579	-3.797	-5.646	-7.610	-9.487	-11.24	-12.48	-13.00	-13.26	-13.45
	-13.57	-13.70	-13.82	-13.92	-13.98	-14.03	-14.07	-14.12	-14.17	-14.22
	-14.26	-14.32	-14.42	-14.53	-14.65	-14.76	-14.93	-15.15	-15.57	-16.44
	-17.38	-18.10	-18.61	-18.95	-19.11					
0 2	-1.325	-3.106	-5.450	-7.619	-9.543	-11.31	-12.56	-13.10	-13.37	-13.56
	-13.69	-13.82	-13.95	-14.05	-14.11	-14.16	-14.21	-14.26	-14.31	-14.36
	-14.40	-14.47	-14.56	-14.68	-14.80	-14.92	-15.09	-15.32	-15.75	-16.65
	-17.60	-18.30	-18.79	-19.12	-19.27					
0 3	1.897	-1.725	-5.317	-7.783	-9.691	-11.42	-12.71	-13.28	-13.56	-13.77
	-13.91	-14.05	-14.19	-14.30	-14.36	-14.42	-14.47	-14.53	-14.58	-14.63
	-14.69	-14.75	-14.86	-14.99	-15.11	-15.24	-15.43	-15.67	-16.14	-17.08
	-18.04	-18.69	-19.14	-19.46	-19.58					
0 4	0.0000E+00	0.0000E+00	-6.092	-8.397	-9.955	-11.47	-12.83	-13.48	-13.80	-14.04
	-14.20	-14.37	-14.53	-14.65	-14.73	-14.80	-14.86	-14.92	-14.99	-15.05
	-15.11	-15.19	-15.31	-15.46	-15.61	-15.76	-15.97	-16.25	-16.78	-17.80
	-18.78	-19.27	-19.60	0.0000E+00	0.0000E+00					
0 5	2.529	0.0000E+00	0.0000E+00	-9.657	-10.21	-11.21	-12.63	-13.48	-13.93	-14.28
	-14.50	-14.72	-14.94	-15.12	-15.23	-15.32	-15.41	-15.49	-15.58	-15.66
	-15.74	-15.84	-15.98	-16.15	-16.29	-16.53	-16.86	-17.23	-17.86	-18.84
	0.0000E+00	0.0000E+00	0.0000E+00	-19.50	-19.35					
0 6	-1.315	-3.317	-7.456	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	-19.12	-18.89	-18.80	-18.63	-18.54					
0 7	-2.510	-3.922	-6.497	-8.486	-9.346	-10.21	-11.59	-12.53	-13.08	-13.48
	-13.73	-13.98	-14.23	-14.44	-14.57	-14.67	-14.77	-14.87	-14.97	-15.06
	-15.15	-15.25	-15.39	-15.52	-15.60	-15.93	-16.34	-16.75	-17.35	-17.99
	-17.96	-17.95	-17.95	-17.90	-17.87					
0 8	-2.791	-3.979	-6.143	-7.977	-9.050	-10.13	-11.50	-12.30	-12.72	-13.03
	-13.25	-13.46	-13.66	-13.83	-13.94	-14.02	-14.10	-14.18	-14.26	-14.34
	-14.42	-14.51	-14.66	-14.85	-15.03	-15.22	-15.51	-15.86	-16.45	-17.22
	-17.43	-17.52	-17.57	-17.57	-17.56					
0 9	-2.898	-3.978	-5.971	-7.740	-8.900	-10.07	-11.41	-12.15	-12.52	-12.81
	-13.00	-13.19	-13.38	-13.53	-13.63	-13.70	-13.78	-13.85	-13.93	-14.00
	-14.08	-14.17	-14.32	-14.50	-14.68	-14.86	-15.13	-15.46	-16.04	-16.85
	-17.16	-17.31	-17.39	-17.40	-17.41					
0 10	-2.954	-3.957	-5.845	-7.574	-8.787	-10.01	-11.34	-12.03	-12.38	-12.64
	-12.81	-12.99	-13.16	-13.30	-13.39	-13.46	-13.53	-13.61	-13.68	-13.75
	-13.82	-13.92	-14.06	-14.24	-14.42	-14.60	-14.86	-15.18	-15.75	-16.59
	-16.97	-17.15	-17.25	-17.28	-17.29					
0 11	-2.985	-3.937	-5.761	-7.465	-8.711	-9.967	-11.28	-11.94	-12.28	-12.52
	-12.69	-12.85	-13.02	-13.15	-13.23	-13.30	-13.37	-13.44	-13.51	-13.58
	-13.65	-13.74	-13.89	-14.07	-14.25	-14.43	-14.69	-15.00	-15.57	-16.42
	-16.84	-17.04	-17.15	-17.20	-17.21					
0 12	-3.009	-3.910	-5.678	-7.360	-8.635	-9.920	-11.22	-11.86	-12.18	-12.41
	-12.57	-12.72	-12.87	-12.99	-13.07	-13.13	-13.19	-13.26	-13.33	-13.40
	-13.47	-13.57	-13.72	-13.90	-14.09	-14.26	-14.52	-14.83	-15.39	-16.25
	-16.71	-16.94	-17.06	-17.12	-17.13					
0 13	-3.027	-3.877	-5.594	-7.256	-8.558	-9.869	-11.15	-11.77	-12.08	-12.30
	-12.44	-12.58	-12.72	-12.82	-12.89	-12.95	-13.01	-13.07	-13.14	-13.21
	-13.29	-13.39	-13.54	-13.74	-13.92	-14.10	-14.35	-14.66	-15.22	-16.09
	-16.58	-16.83	-16.97	-17.03	-17.06					
0 14	-3.037	-3.845	-5.528	-7.175	-8.496	-9.827	-11.10	-11.70	-12.00	-12.21
	-12.35	-12.48	-12.60	-12.69	-12.74	-12.79	-12.84	-12.90	-12.97	-13.05
	-13.13	-13.24	-13.41	-13.61	-13.80	-13.98	-14.23	-14.54	-15.09	-15.97
	-16.48	-16.75	-16.90	-16.97	-16.99					
0 15	-3.041	-3.824	-5.486	-7.125	-8.457	-9.799	-11.07	-11.66	-11.95	-12.16
	-12.29	-12.41	-12.52	-12.60	-12.64	-12.68	-12.71	-12.77	-12.84	-12.93
	-13.03	-13.14	-13.32	-13.53	-13.72	-13.90	-14.15	-14.46	-15.01	-15.89
	-16.42	-16.69	-16.85	-16.93	-16.95					
0 16	-3.043	-3.805	-5.452	-7.085	-8.426	-9.777	-11.04	-11.63	-11.91	-12.12
	-12.25	-12.36	-12.47	-12.53	-12.56	-12.58	-12.60	-12.64	-12.73	-12.84
	-12.94	-13.07	-13.26	-13.47	-13.66	-13.84	-14.09	-14.40	-14.95	-15.83
	-16.37	-16.65	-16.81	-16.89	-16.92					
0 17	-3.045	-3.786	-5.418	-7.046	-8.395	-9.754	-11.01	-11.59	-11.87	-12.08
	-12.20	-12.32	-12.42	-12.47	-12.49	-12.49	-12.47	-12.45	-12.60	-12.74
	-12.87	-13.01	-13.20	-13.41	-13.61	-13.78	-14.04	-14.34	-14.88	-15.77
	-16.32	-16.61	-16.78	-16.86	-16.89					
0 18	-3.046	-3.766	-5.384	-7.006	-8.364	-9.731	-10.98	-11.56	-11.84	-12.04
	-12.16	-12.27	-12.37	-12.42	-4.431	-12.41	-12.34	-12.09	-12.46	-12.66
	-12.81	-12.95	-13.15	-13.36	-13.55	-13.73	-13.98	-14.28	-14.82	-15.71
	-16.27	-16.57	-16.74	-16.83	-16.86					
0 19	1.0000E+30	-3.744	-5.351	-6.967	-8.333	-9.707	-10.95	-11.52	-11.80	-12.00
	-12.12	-12.23	-12.33	-4.382	-12.40	-12.39	-12.37	-12.35	-12.50	-12.64
	-12.77	-12.91	-13.10	-13.31	-13.50	-13.67	-13.92	-14.22	-14.76	-15.65
	-16.22	-16.53	-16.71	-16.79	-16.83					
0 20	-2.431	-3.721	-5.317	-6.928	-8.301	-9.683	-10.93	-11.49	-11.77	-11.96
	-12.08	-12.20	-12.29	-12.35	-12.38	-12.39	-12.41	-12.44	-12.53	-12.64
	-12.75	-12.87	-13.06	-13.26	-13.45	-13.62	-13.87	-14.17	-14.70	-15.59
	-16.17	-16.49	-16.67	-16.76	-16.80					
0 21	-2.430	-3.697	-5.283	-6.889	-8.270	-9.659	-10.90	-11.46	-11.73	-11.92
	-12.05	-12.16	-12.26	-12.33	-12.36	-12.39	-12.43	-12.48	-12.55	-12.64
	-12.73	-12.84	-13.02	-13.21	-13.40	-13.57	-13.81	-14.11	-14.64	-15.53
	-16.12	-16.45	-16.63	-16.73	-16.77					
0 22	-2.426	-3.667	-5.240	-6.841	-8.231	-9.628	-10.86	-11.42	-11.69	-11.88
	-12.00	-12.12	-12.22	-12.30	-12.35	-12.39	-12.43	-12.49	-12.55	-12.63
	-12.71	-12.81	-12.97	-13.16	-13.34	-13.51	-13.75	-14.04	-14.57	-15.46
	-16.06	-16.40	-16.59	-16.69	-16.73					

0 23	-2.416	-3.618	-5.171	-6.764	-8.167	-9.578	-10.80	-11.35	-11.62	-11.81
	-11.93	-12.05	-12.17	-12.26	-12.32	-12.36	-12.42	-12.47	-12.53	-12.60
	-12.67	-12.76	-12.90	-13.08	-13.25	-13.41	-13.65	-13.93	-14.46	-15.35
	-15.97	-16.31	-16.52	-16.62	-16.67					
0 24	-2.395	-3.553	-5.084	-6.668	-8.088	-9.513	-10.73	-11.27	-11.54	-11.73
	-11.85	-11.98	-12.10	-12.20	-12.26	-12.31	-12.37	-12.42	-12.48	-12.54
	-4.606	-12.69	-12.82	-12.98	-13.14	-13.30	-13.52	-13.81	-14.32	-15.21
	-15.85	-16.21	-16.43	-16.54	-16.59					
0 25	-2.366	-3.485	-4.997	-6.573	-8.008	-9.447	-10.65	-11.19	-11.45	-11.65
	-11.77	-11.90	-12.03	-12.13	-12.19	-12.25	-12.30	-12.36	-12.42	-12.47
	-12.53	-12.61	-12.73	-12.89	-13.04	-13.19	-13.41	-13.68	-14.19	-15.08
	-15.73	-16.11	-16.34	-16.46	-16.51					
0 26	-2.329	-3.414	-4.908	-6.479	-7.927	-9.379	-10.58	-11.11	-11.37	-11.57
	-11.70	-11.82	-11.95	-12.06	-12.12	-12.18	-12.23	-12.29	-12.34	-12.40
	-12.46	-12.53	-12.65	-12.79	-12.94	-13.08	-13.29	-13.56	-14.06	-14.95
	-15.62	-16.01	-16.25	-16.38	-16.44					
0 27	-2.262	-3.303	-4.773	-6.338	-7.806	-9.275	-10.47	-10.99	-11.26	-11.45
	-11.58	-11.71	-11.84	-11.94	-12.01	-12.06	-12.12	-12.17	-12.22	-12.28
	-12.33	-12.40	-12.51	-12.65	-12.79	-12.93	-13.13	-13.39	-13.87	-14.75
	-15.45	-15.87	-16.12	-16.26	-16.32					
0 28	-2.143	-3.142	-4.589	-6.150	-7.642	-9.131	-10.32	-10.84	-11.10	-11.29
	-11.42	-11.55	-11.68	-11.78	-11.85	-11.90	-11.95	-12.00	-12.06	-12.11
	-12.16	-12.23	-12.33	-12.47	-12.60	-12.73	-12.92	-13.17	-13.64	-14.51
	-15.23	-15.67	-15.95	-16.10	-16.17					
0 29	-1.848	5.211	-4.208	-5.773	-7.311	-8.836	-10.01	-10.52	-10.78	-2.967
	-11.09	-11.22	-11.35	-11.45	-11.51	-11.56	-11.61	-11.66	-11.71	-11.76
	-11.81	-11.87	-11.97	-12.09	-12.21	-12.34	-12.51	-12.74	-13.19	-14.04
	-14.80	-15.29	-15.61	-15.79	-15.87					
0 30	-0.8070	-1.785	-3.263	-4.903	-6.540	-8.135	-9.300	-9.802	-10.05	-10.23
	-10.35	-10.47	-10.59	-10.69	-10.75	-10.79	-10.84	-10.89	-10.93	-10.98
	-11.02	-11.08	-11.17	-11.29	-11.40	-11.51	-11.67	-11.88	-12.29	-13.11
	-13.93	-14.50	-14.88	-15.11	-15.23					
0 31	1.658	0.1478	-1.748	-3.659	-5.482	-7.189	-8.382	-8.885	-9.131	-9.312
	-9.432	-9.550	-9.668	-9.761	-9.818	-9.864	-9.910	-9.955	-10.00	-10.05
	-10.09	-10.15	-10.24	-10.34	-10.45	-10.56	-10.72	-10.92	-11.32	-12.13
	-12.98	-13.61	-14.05	-14.33	-14.46					
0 32	0.0000E+00	2.667	-6.9946E-02	-2.388	-4.448	-6.298	-7.546	-8.065	-8.318	-8.503
	-8.625	-8.746	-8.865	-8.959	-9.018	-9.064	-9.110	-9.156	-9.202	-9.248
	-9.293	-9.350	-9.439	-9.550	-9.659	-9.766	-9.925	-10.13	-10.53	-11.35
	-12.22	-12.89	-13.37	-13.68	-13.83					
0 33	0.0000E+00	0.0000E+00	1.413	-1.224	-3.517	-5.525	-6.845	-7.387	-7.650	-7.842
	-7.969	-8.093	-8.216	-8.314	-8.374	-8.422	-8.469	-8.517	-8.564	-8.611
	-8.657	-8.715	-8.807	-8.920	-9.032	-9.142	-9.305	-9.515	-9.922	-10.75
	-11.65	-12.34	-12.85	-13.17	-13.33					
0 34	5.240	0.0000E+00	2.247	-0.2273	-2.746	-4.928	-6.325	-6.892	-7.166	-7.366
	-7.497	-7.627	-7.754	-7.854	-7.917	-7.966	-8.015	-8.064	-8.113	-8.161
	-8.209	-8.269	-8.363	-8.480	-8.594	-8.707	-8.874	-9.089	-9.505	-10.35
	-11.27	-11.98	-12.49	-12.83	-13.00					
0 35	4.733	4.234	0.0000E+00	0.0000E+00	-3.170	-4.571	-6.036	-6.624	-6.906	-7.112
	-7.247	-7.379	-7.510	-7.612	-7.676	-7.727	-7.777	-7.827	-7.876	-7.926
	-7.975	-8.035	-8.132	-8.250	-8.367	-8.482	-8.651	-8.870	-9.292	-10.15
	-11.07	-11.79	-12.32	-12.66	-12.83					

0

VOLUMETRIC BUDGET FOR ENTIRE MODEL AT END OF TIME STEP 20 IN STRESS PERIOD 1

	CUMULATIVE VOLUMES	L**3	RATES FOR THIS TIME STEP	L**3/T
	IN:		IN:	
	STORAGE =	0.00000E+00	STORAGE =	0.00000E+00
	CONSTANT HEAD =	0.95480E+06	CONSTANT HEAD =	0.55255
	WELLS =	0.00000E+00	WELLS =	0.00000E+00
0	TOTAL IN =	0.95480E+06	TOTAL IN =	0.55255
0	OUT:		OUT:	
	STORAGE =	0.00000E+00	STORAGE =	0.00000E+00
	CONSTANT HEAD =	0.92716E+06	CONSTANT HEAD =	0.53656
	WELLS =	27648.	WELLS =	0.16000E-01
0	TOTAL OUT =	0.95481E+06	TOTAL OUT =	0.55256
0	IN - OUT =	-3.1875	IN - OUT =	-0.17107E-04
0	PERCENT DISCREPANCY =	0.00	PERCENT DISCREPANCY =	0.00

0

TIME SUMMARY AT END OF TIME STEP 20 IN STRESS PERIOD 1

	SECONDS	MINUTES	HOURS	DAYS	YEARS
TIME STEP LENGTH	86400.0	1440.00	24.0000	1.00000	0.273785E-02
STRESS PERIOD TIME	0.172800E+07	28800.0	480.000	20.0000	0.547570E-01
TOTAL SIMULATION TIME	0.172800E+07	28800.0	480.000	20.0000	0.547570E-01

1

120FEET N OF 4S

NO WELL

```
1                    U.S. GEOLOGICAL SURVEY MODULAR FINITE-DIFFERENCE GROUND-WATER MODEL
0BONMOD2 1 layer, 35 rows, 35 columns, 0 well                                      unconfined, impermeable bedrock 120N of 4S
   1 LAYERS          35 ROWS          35 COLUMNS
  1 STRESS PERIOD(S) IN SIMULATION
 MODEL TIME UNIT IS SECONDS
0I/O UNITS:
 ELEMENT OF IUNIT:  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
         I/O UNIT: 11  0  0  0  0  0  0  0 19  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0BAS1 -- BASIC MODEL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT  1
 ARRAYS RHS AND BUFF WILL SHARE MEMORY.
 START HEAD WILL BE SAVED
    11099 ELEMENTS IN X ARRAY ARE USED BY BAS
    11099 ELEMENTS OF X ARRAY USED OUT OF    30000
0BCF1 -- BLOCK-CENTERED FLOW PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 11
 STEADY-STATE SIMULATION
      LAYER  AQUIFER TYPE
      -------------------
        1          1
     2451 ELEMENTS IN X ARRAY ARE USED BY BCF
    13550 ELEMENTS OF X ARRAY USED OUT OF    30000
0SIP1 -- STRONGLY IMPLICIT PROCEDURE SOLUTION PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 19
 MAXIMUM OF 100 ITERATIONS ALLOWED FOR CLOSURE
  5 ITERATION PARAMETERS
     5305 ELEMENTS IN X ARRAY ARE USED BY SIP
    18855 ELEMENTS OF X ARRAY USED OUT OF    30000
1BONMOD2 1 layer, 35 rows, 35 columns, 0 well                                      unconfined, impermeable bedrock 120N of 4S
0
```

BOUNDARY ARRAY FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35I2)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
0 1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 4	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	-1
0 5	1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	-1	-1	1	1
0 6	1	1	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	1	1	1	1	1
0 7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 32	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 33	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 34	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 35	1	1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

0AQUIFER HEAD WILL BE SET TO 999.90 AT ALL NO-FLOW NODES (IBOUND=0).
0

INITIAL HEAD FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35F5.0)

	1 16 31	2 17 32	3 18 33	4 19 34	5 20 35	6 21	7 22	8 23	9 24	10 25	11 26	12 27	13 28	14 29	15 30
0 1	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 2	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 3	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 4	870.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	900.0	900.0										
0 5	880.0	880.0	890.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	900.0	900.0	900.0	880.0	880.0										
0 6	880.0	880.0	880.0	890.0	890.0	890.0	891.0	892.0	894.0	895.0	895.0	895.0	895.0	896.0	896.0
	896.0	897.0	897.0	898.0	898.0	899.0	899.0	899.0	900.0	880.0	900.0	900.0	900.0	900.0	900.0
	880.0	880.0	880.0	880.0	880.0										
0 7	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 8	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 9	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 10	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 11	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 12	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 13	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 14	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 15	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 16	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 17	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 18	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 19	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 20	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 21	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 22	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 23	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 24	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 25	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 26	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 27	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 28	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 29	880.0	888.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 30	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 31	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 32	874.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 33	874.0	875.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 34	880.0	875.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0

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          880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
          880.0   880.0   880.0   880.0   880.0
0 35      880.0   880.0   877.0   879.0   879.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
          880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
          880.0   880.0   880.0   880.0   880.0
0DEFAULT OUTPUT CONTROL -- THE FOLLOWING OUTPUT COMES AT THE END OF EACH STRESS PERIOD:
 TOTAL VOLUMETRIC BUDGET
          HEAD
          DRAWDOWN
0                                           COLUMN TO ROW ANISOTROPY =    1.000000
0

                                          DELR WILL BE READ ON UNIT 11 USING FORMAT:            (35F4.0)
                         ------------------------------------------------------------------------------

   60.000      60.000      60.000      60.000      60.000      60.000      30.000      10.000      10.000      5.0000
   5.0000      5.0000      5.0000      3.0000      2.0000      2.0000      2.0000      2.0000      2.0000      2.0000
   2.0000      3.0000      5.0000      5.0000      5.0000      5.0000      10.000      10.000      30.000      60.000
   60.000      60.000      60.000      60.000      60.000
0

                                          DELC WILL BE READ ON UNIT 11 USING FORMAT:            (35F4.0)
                         ------------------------------------------------------------------------------

   60.000      60.000      60.000      60.000      60.000      60.000      30.000      10.000      10.000      5.0000
   5.0000      5.0000      5.0000      3.0000      2.0000      2.0000      2.0000      2.0000      2.0000      2.0000
   2.0000      3.0000      5.0000      5.0000      5.0000      5.0000      10.000      10.000      30.000      60.000
   60.000      60.000      60.000      60.000      60.000
0                                              HYD. COND. ALONG ROWS =  0.2500000E-03 FOR LAYER  1
0                                                             BOTTOM =   840.0000     FOR LAYER  1
0


                                                    SOLUTION BY THE STRONGLY IMPLICIT PROCEDURE
                                                    -------------------------------------------
0                                         MAXIMUM ITERATIONS ALLOWED FOR CLOSURE =       100
                                                          ACCELERATION PARAMETER =     1.0000
                                              HEAD CHANGE CRITERION FOR CLOSURE =    0.10000E-02
                                              SIP HEAD CHANGE PRINTOUT INTERVAL =        1

0
    5 ITERATION PARAMETERS CALCULATED FROM SPECIFIED WSEED = 0.00100000 :

         0.0000000E+00  0.8221720E+00  0.9683772E+00  0.9943766E+00  0.9990000E+00
1                                              STRESS PERIOD NO.   1, LENGTH =    1728000.
                                               ----------------------------------------------

                                               NUMBER OF TIME STEPS =    20

                                                MULTIPLIER FOR DELT =     1.000

                                             INITIAL TIME STEP SIZE =   86400.00
0**********NODE   1  19   1 (LAYER,ROW,COL) WENT DRY AT ITERATION =  1  TIME STEP =  1  STRESS PERIOD =  1
0
    31 ITERATIONS FOR TIME STEP   1 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL READ CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
    16.03     (  1,  5, 34)   11.47     (  1,  1, 35)   5.165     (  1,  3, 10)   7.377     (  1,  1, 19)   9.421     (  1, 20, 18)
   -1.004     (  1, 18,  1)  -1.238     (  1, 28,  1) -0.7976     (  1, 18,  1) -0.9786     (  1, 20,  1) -0.8413     (  1, 25, 10)
  -0.1989     (  1, 29, 14)  0.1514     (  1, 25, 10) -0.1590     (  1, 28, 22)  0.3300     (  1, 19, 15)  0.1663     (  1, 24, 25)
   0.3635E-01 (  1, 21,  7)  0.2685E-01 (  1, 28,  1) -0.5826E-01 (  1, 18, 16) -0.7256E-01 (  1, 15, 15) -0.6424E-01 (  1, 27, 14)
  -0.9280E-02 (  1, 23, 12) -0.1079E-01 (  1, 24, 11)  0.6376E-02 (  1, 22, 23)  0.1032E-01 (  1, 25, 20)  0.8136E-02 (  1, 20, 13)
  -0.1115E-02 (  1, 13,  8)  0.1028E-02 (  1, 30,  6) -0.1480E-02 (  1, 25, 20) -0.1879E-02 (  1, 22, 12) -0.2612E-02 (  1, 16, 16)
   0.5191E-03 (  1, 23, 12)
0
     1 ITERATIONS FOR TIME STEP   2 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.3055E-03 (  1, 23, 11)
0
     1 ITERATIONS FOR TIME STEP   3 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.2023E-03 (  1, 23, 11)
0
     1 ITERATIONS FOR TIME STEP   4 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.1416E-03 (  1, 22, 12)
0
     1 ITERATIONS FOR TIME STEP   5 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.1052E-03 (  1, 21, 12)
0
     1 ITERATIONS FOR TIME STEP   6 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.8202E-04 (  1, 21, 12)
0
     1 ITERATIONS FOR TIME STEP   7 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.6670E-04 (  1, 20, 13)
0
     1 ITERATIONS FOR TIME STEP   8 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.5604E-04 (  1, 19, 14)
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0
     1 ITERATIONS FOR TIME STEP    9 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.4799E-04 (  1, 19, 14)
0
     1 ITERATIONS FOR TIME STEP   10 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.4162E-04 (  1, 18, 14)
0
     1 ITERATIONS FOR TIME STEP   11 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.3657E-04 (  1, 18, 14)
0
     1 ITERATIONS FOR TIME STEP   12 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.3237E-04 (  1, 18, 14)
0
     1 ITERATIONS FOR TIME STEP   13 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.2892E-04 (  1, 18, 14)
0
     1 ITERATIONS FOR TIME STEP   14 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.2597E-04 (  1, 18, 14)
0
     1 ITERATIONS FOR TIME STEP   15 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.2354E-04 (  1, 18, 14)
0
     1 ITERATIONS FOR TIME STEP   16 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.2144E-04 (  1, 18, 14)
0
     1 ITERATIONS FOR TIME STEP   17 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.1967E-04 (  1, 18, 14)
0
     1 ITERATIONS FOR TIME STEP   18 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.1812E-04 (  1, 18, 14)
0
     1 ITERATIONS FOR TIME STEP   19 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.1680E-04 (  1, 18, 15)
0
     1 ITERATIONS FOR TIME STEP   20 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.1566E-04 (  1, 18, 15)
0
1
```

HEAD IN LAYER 1 AT END OF TIME STEP 20 IN STRESS PERIOD 1

	1 11 21 31	2 12 22 32	3 13 23 33	4 14 24 34	5 15 25 35	6 16 26	7 17 27	8 18 28	9 19 29	10 20 30
0 1	882.8	883.8	885.6	887.6	889.5	891.2	892.5	893.0	893.3	893.4
	893.6	893.7	893.8	893.9	894.0	894.0	894.1	894.1	894.2	894.2
	894.3	894.3	894.4	894.5	894.6	894.8	894.9	895.1	895.6	896.4
	897.4	898.1	898.6	898.9	899.1					
0 2	881.3	883.1	885.5	887.6	889.5	891.3	892.6	893.1	893.4	893.6
	893.7	893.8	893.9	894.0	894.1	894.2	894.2	894.3	894.3	894.4
	894.4	894.5	894.6	894.7	894.8	894.9	895.1	895.3	895.8	896.6
	897.6	898.3	898.8	899.1	899.3					
0 3	878.1	881.7	885.3	887.8	889.7	891.4	892.7	893.3	893.6	893.8
	893.9	894.1	894.2	894.3	894.4	894.4	894.5	894.5	894.6	894.6
	894.7	894.8	894.9	895.0	895.1	895.2	895.4	895.7	896.1	897.1
	898.0	898.7	899.1	899.5	899.6					
0 4	870.0	880.0	886.1	888.4	890.0	891.5	892.8	893.5	893.8	894.0
	894.2	894.4	894.5	894.7	894.7	894.8	894.9	894.9	895.0	895.0
	895.1	895.2	895.3	895.5	895.6	895.8	896.0	896.3	896.8	897.8
	898.8	899.3	899.6	900.0	900.0					
0 5	877.5	880.0	890.0	889.7	890.2	891.2	892.6	893.5	893.9	894.3
	894.5	894.7	894.9	895.1	895.2	895.3	895.4	895.5	895.6	895.7
	895.7	895.8	896.0	896.1	896.3	896.5	896.9	897.2	897.9	898.8
	900.0	900.0	900.0	899.5	899.4					
0 6	881.3	883.3	887.5	890.0	890.0	890.0	891.0	892.0	894.0	895.0
	895.0	895.0	895.0	896.0	896.0	896.0	897.0	897.0	898.0	898.0
	899.0	899.0	899.0	900.0	880.0	900.0	900.0	900.0	900.0	900.0
	899.1	898.9	898.8	898.7	898.6					
0 7	882.5	883.9	886.5	888.5	889.4	890.3	891.7	892.7	893.2	893.6
	893.9	894.1	894.4	894.6	894.7	894.8	894.9	895.0	895.1	895.2
	895.3	895.4	895.6	895.7	895.8	896.1	896.5	896.9	897.5	898.1

	898.0	898.0	898.0	897.9	897.9					
0 8	882.8	884.0	886.2	888.0	889.1	890.2	891.7	892.5	892.9	893.3
	893.5	893.7	893.9	894.1	894.2	894.3	894.4	[illegible]	894.5	894.6
	894.7	894.8	894.9	895.1	895.3	895.5	895.7	896.1	896.6	897.3
	897.5	897.6	897.6	897.6	897.6					
0 9	882.9	884.0	886.0	887.8	889.0	890.2	891.6	892.4	892.8	893.1
	893.3	893.5	893.7	893.9	893.9	894.0	894.1	894.2	894.3	894.3
	894.4	894.5	894.6	894.8	895.0	895.1	895.4	895.7	896.2	897.0
	897.2	897.4	897.4	897.5	897.5					
0 10	883.0	884.0	885.9	887.6	888.9	890.1	891.6	892.3	892.7	893.0
	893.2	893.3	893.5	893.7	893.8	893.8	893.9	894.0	894.1	894.1
	894.2	894.3	894.4	894.6	894.8	894.9	895.1	895.4	896.0	896.7
	897.1	897.2	897.3	897.3	897.3					
0 11	883.0	884.0	885.8	887.5	888.8	890.1	891.5	892.2	892.6	892.9
	893.1	893.2	893.4	893.6	893.7	893.7	893.8	893.9	893.9	894.0
	894.1	894.2	894.3	894.4	894.6	894.8	895.0	895.3	895.8	896.6
	896.9	897.1	897.2	897.3	897.3					
0 12	883.0	883.9	885.7	887.4	888.7	890.1	891.5	892.2	892.5	892.8
	893.0	893.1	893.3	893.4	893.5	893.6	893.7	893.7	893.8	893.9
	893.9	894.0	894.2	894.3	894.5	894.6	894.8	895.1	895.6	896.4
	896.8	897.0	897.1	897.2	897.2					
0 13	883.1	883.9	885.6	887.3	888.7	890.0	891.4	892.1	892.4	892.7
	892.9	893.0	893.2	893.3	893.4	893.5	893.6	893.6	893.7	893.8
	893.8	893.9	894.0	894.2	894.3	894.5	894.7	895.0	895.5	896.2
	896.7	896.9	897.0	897.1	897.1					
0 14	883.1	883.9	885.6	887.2	888.6	890.0	891.3	892.0	892.4	892.6
	892.8	893.0	893.1	893.3	893.3	893.4	893.5	893.5	893.6	893.7
	893.7	893.8	893.9	894.1	894.2	894.4	894.6	894.8	895.3	896.1
	896.6	896.8	897.0	897.0	897.1					
0 15	883.1	883.9	885.5	887.2	888.6	890.0	891.3	892.0	892.3	892.6
	892.7	892.9	893.1	893.2	893.3	893.3	893.4	893.5	893.5	893.6
	893.7	893.7	893.9	894.0	894.2	894.3	894.5	894.8	895.3	896.0
	896.5	896.8	896.9	897.0	897.0					
0 16	883.1	883.8	885.5	887.2	888.5	889.9	891.3	891.9	892.3	892.5
	892.7	892.9	893.0	893.2	893.2	893.3	893.4	893.4	893.5	893.5
	893.6	893.7	893.8	894.0	894.1	894.2	894.5	894.7	895.2	896.0
	896.5	896.7	896.9	897.0	897.0					
0 17	883.1	883.8	885.5	887.1	888.5	889.9	891.3	891.9	892.2	892.5
	892.7	892.8	893.0	893.1	893.2	893.3	893.3	893.4	893.4	893.5
	893.6	893.6	893.8	893.9	894.1	894.2	894.4	894.7	895.1	895.9
	896.4	896.7	896.9	896.9	897.0					
0 18	883.1	883.8	885.4	887.1	888.5	889.9	891.2	891.9	892.2	892.5
	892.6	892.8	892.9	893.1	893.1	893.2	893.3	893.3	893.4	893.5
	893.5	893.6	893.7	893.9	894.0	894.1	894.3	894.6	895.1	895.9
	896.4	896.7	896.8	896.9	896.9					
0 19	1.0000E+30	883.8	885.4	887.0	888.4	889.9	891.2	891.9	892.2	892.4
	892.6	892.7	892.9	893.0	893.1	893.2	893.2	893.3	893.3	893.4
	893.5	893.5	893.7	893.8	893.9	894.1	894.3	894.5	895.0	895.8
	896.3	896.6	896.8	896.9	896.9					
0 20	882.5	883.8	885.4	887.0	888.4	889.8	891.2	891.8	892.1	892.4
	892.5	892.7	892.9	893.0	893.1	893.1	893.2	893.2	893.3	893.4
	893.4	893.5	893.6	893.8	893.9	894.0	894.2	894.5	895.0	895.8
	896.3	896.6	896.7	896.8	896.9					
0 21	882.5	883.7	885.3	887.0	888.4	889.8	891.2	891.8	892.1	892.3
	892.5	892.7	892.8	892.9	893.0	893.1	893.1	893.2	893.3	893.3
	893.4	893.4	893.6	893.7	893.8	894.0	894.2	894.4	894.9	895.7
	896.2	896.5	896.7	896.8	896.8					
0 22	882.5	883.7	885.3	886.9	888.3	889.8	891.1	891.7	892.1	892.3
	892.5	892.6	892.8	892.9	893.0	893.0	893.1	893.1	893.2	893.3
	893.3	893.4	893.5	893.6	893.8	893.9	894.1	894.4	894.8	895.6
	896.2	896.5	896.7	896.8	896.8					
0 23	882.5	883.7	885.2	886.8	888.3	889.7	891.1	891.7	892.0	892.2
	892.4	892.5	892.7	892.8	892.9	892.9	893.0	893.1	893.1	893.2
	893.2	893.3	893.4	893.5	893.7	893.8	894.0	894.3	894.7	895.5
	896.1	896.4	896.6	896.7	896.7					
0 24	882.4	883.6	885.1	886.7	888.2	889.7	891.0	891.6	891.9	892.1
	892.3	892.4	892.6	892.7	892.8	892.8	892.9	892.9	893.0	893.1
	893.1	893.2	893.3	893.4	893.6	893.7	893.9	894.1	894.6	895.4
	896.0	896.3	896.5	896.6	896.7					
0 25	882.4	883.5	885.1	886.6	888.1	889.6	890.9	891.5	891.8	892.0
	892.2	892.3	892.5	892.6	892.7	892.7	892.8	892.8	892.9	892.9
	893.0	893.1	893.2	893.3	893.4	893.6	893.8	894.0	894.4	895.3
	895.9	896.2	896.4	896.5	896.6					
0 26	882.4	883.5	885.0	886.6	888.0	889.6	890.8	891.4	891.7	891.9
	892.1	892.2	892.4	892.5	892.6	892.6	892.7	892.7	892.8	892.8
	892.9	893.0	893.1	893.2	893.3	893.5	893.6	893.9	894.3	895.1
	895.7	896.1	896.3	896.5	896.5					
0 27	882.3	883.3	884.8	886.4	887.9	889.5	890.7	891.3	891.6	891.8
	891.9	892.1	892.2	892.3	892.4	892.5	892.5	892.6	892.6	892.7
	892.7	892.8	892.9	893.0	893.2	893.3	893.5	893.7	894.1	894.9
	895.6	896.0	896.2	896.3	896.4					
0 28	882.2	883.2	884.6	886.2	887.8	889.3	890.6	891.1	891.4	891.6
	891.8	891.9	892.0	892.1	892.2	892.3	892.3	892.4	892.4	892.5
	892.5	892.6	892.7	892.8	892.9	893.1	893.2	893.5	893.9	894.7
	895.4	895.8	896.0	896.2	896.3					
0 29	881.9	882.8	884.3	885.9	887.4	889.0	890.2	890.8	891.1	891.3
	891.4	891.5	891.6	891.7	891.8	891.9	891.9	892.0	892.0	892.1
	892.1	892.2	892.3	892.4	892.5	892.6	892.8	893.0	893.4	894.2
	894.9	895.4	895.7	895.9	896.0					
0 30	880.8	881.8	883.3	885.0	886.7	888.3	889.5	890.0	890.3	890.5
	890.6	890.7	890.8	890.9	891.0	891.0	891.1	891.1	891.2	891.2
	891.3	891.3	891.4	891.5	891.6	891.7	891.9	892.1	892.5	893.3
	894.1	894.6	895.0	895.2	895.3					
0 31	878.4	879.9	881.8	883.7	885.6	887.3	888.5	889.1	889.3	889.5
	889.6	889.7	889.8	889.9	890.0	890.0	890.1	890.1	890.2	890.2
	890.3	890.3	890.4	890.5	890.6	890.7	890.9	891.1	891.5	892.3
	893.3	893.7	894.2	894.4	894.6					
0 32	874.0	877.4	880.1	882.5	884.5	886.4	887.7	888.2	888.5	888.7
	888.8	888.9	889.0	889.1	889.2	889.2	889.3	889.3	889.4	889.4
	889.4	889.5	889.6	889.7	889.8	889.9	890.1	890.3	890.7	891.5
	892.4	893.0	893.5	893.8	893.9					
0 33	874.0	875.0	878.6	881.3	883.6	885.6	887.0	887.5	887.8	888.0
	888.1	888.2	888.3	888.4	888.5	888.6	888.6	888.6	888.7	888.7
	888.8	888.8	888.9	889.1	889.2	889.3	889.4	889.7	890.1	890.9
	891.8	892.5	893.0	893.3	893.4					
0 34	874.8	875.0	877.8	880.3	882.8	885.0	886.4	887.0	887.3	887.5
	887.6	887.7	887.9	888.0	888.0	888.1	888.1	888.2	888.2	888.3
	888.3	888.4	888.5	888.6	888.7	888.8	889.0	889.2	889.6	890.5

constant head erroneously set at 800 instead of 880, didn't affect model outcome

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          891.4        892.1        892.6        893.0        893.1
0 35      875.3        875.8        877.0        879.0        882.2        884.7        886.1        886.7        887.0        887.2
          887.4        887.5        887.6        887.7        887.8        887.8        887.9        887.9        888.0        888.0
          888.1        888.2        888.2        888.4        888.5        888.6        888.8        889.0        889.4        890.3
          891.2        891.9        892.4        892.8        892.9
1                  DRAWDOWN IN LAYER  1 AT END OF TIME STEP 20 IN STRESS PERIOD  1
           ---------------------------------------------------------------------------------------

            1            2            3            4            5            6            7            8            9           10
           11           12           13           14           15           16           17           18           19           20
           21           22           23           24           25           26           27           28           29           30
           31           32           33           34           35
..........................................................................................................................................
0  1     -2.579       -3.797       -5.646       -7.610       -9.487       -11.24       -12.48       -13.00       -13.26       -13.45
         -13.57       -13.70       -13.82       -13.92       -13.98       -14.03       -14.07       -14.12       -14.17       -14.22
         -14.26       -14.32       -14.42       -14.53       -14.65       -14.76       -14.93       -15.15       -15.57       -16.44
         -17.38       -18.10       -18.61       -18.95       -19.11
0  2     -1.325       -3.106       -5.450       -7.619       -9.543       -11.31       -12.56       -13.10       -13.37       -13.56
         -13.69       -13.82       -13.95       -14.05       -14.11       -14.16       -14.21       -14.26       -14.31       -14.36
         -14.40       -14.47       -14.56       -14.68       -14.80       -14.92       -15.09       -15.32       -15.75       -16.65
         -17.60       -18.30       -18.79       -19.12       -19.27
0  3      1.897       -1.725       -5.317       -7.783       -9.691       -11.42       -12.71       -13.28       -13.56       -13.77
         -13.91       -14.05       -14.19       -14.30       -14.36       -14.42       -14.47       -14.53       -14.58       -14.63
         -14.69       -14.75       -14.86       -14.99       -15.11       -15.24       -15.43       -15.67       -16.14       -17.08
         -18.04       -18.69       -19.14       -19.46       -19.58
0  4     0.0000E+00   0.0000E+00   -6.092       -8.397       -9.955       -11.47       -12.83       -13.48       -13.80       -14.04
         -14.20       -14.37       -14.53       -14.65       -14.73       -14.80       -14.86       -14.92       -14.99       -15.05
         -15.11       -15.19       -15.31       -15.46       -15.61       -15.76       -15.97       -16.25       -16.78       -17.80
         -18.78       -19.27       -19.60       0.0000E+00   0.0000E+00
0  5      2.524       0.0000E+00   0.0000E+00   -9.657       -10.21       -11.21       -12.63       -13.48       -13.93       -14.28
         -14.50       -14.72       -14.94       -15.12       -15.23       -15.32       -15.41       -15.49       -15.58       -15.66
         -15.74       -15.84       -15.98       -16.15       -16.29       -16.53       -16.86       -17.23       -17.86       -18.84
         0.0000E+00   0.0000E+00   0.0000E+00   -19.51       -19.36
0  6     -1.330       -3.331       -7.467       0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
         0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
         0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
         -19.15       -18.92       -18.83       -18.66       -18.57
0  7     -2.532       -3.947       -6.525       -8.517       -9.394       -10.28       -11.71       -12.68       -13.23       -13.64
         -13.89       -14.14       -14.40       -14.60       -14.73       -14.83       -14.94       -15.03       -15.13       -15.22
         -15.31       -15.41       -15.55       -15.68       -15.76       -16.08       -16.49       -16.89       -17.47       -18.07
         -18.02       -18.00       -18.00       -17.95       -17.91
0  8     -2.815       -4.008       -6.178       -8.021       -9.117       -10.24       -11.67       -12.50       -12.94       -13.27
         -13.49       -13.71       -13.93       -14.09       -14.20       -14.28       -14.36       -14.45       -14.53       -14.60
         -14.68       -14.77       -14.92       -15.10       -15.27       -15.46       -15.73       -16.06       -16.62       -17.33
         -17.51       -17.59       -17.63       -17.62       -17.61
0  9     -2.923       -4.010       -6.010       -7.790       -8.976       -10.19       -11.61       -12.39       -12.79       -13.10
         -13.30       -13.50       -13.70       -13.85       -13.95       -14.03       -14.10       -14.18       -14.25       -14.32
         -14.40       -14.49       -14.63       -14.80       -14.97       -15.14       -15.39       -15.69       -16.23       -16.97
         -17.25       -17.38       -17.45       -17.46       -17.46
0 10     -2.980       -3.991       -5.886       -7.628       -8.869       -10.14       -11.55       -12.29       -12.67       -12.96
         -13.15       -13.34       -13.53       -13.68       -13.77       -13.84       -13.91       -13.99       -14.06       -14.13
         -14.20       -14.29       -14.42       -14.59       -14.75       -14.91       -15.15       -15.44       -15.96       -16.72
         -17.06       -17.22       -17.31       -17.34       -17.35
0 11     -3.012       -3.972       -5.804       -7.522       -8.797       -10.11       -11.50       -12.22       -12.59       -12.87
         -13.05       -13.24       -13.42       -13.56       -13.65       -13.72       -13.79       -13.86       -13.93       -14.00
         -14.07       -14.15       -14.29       -14.45       -14.61       -14.76       -14.99       -15.27       -15.78       -16.56
         -16.93       -17.12       -17.22       -17.26       -17.27
0 12     -3.036       -3.946       -5.722       -7.419       -8.724       -10.07       -11.45       -12.15       -12.51       -12.78
         -12.96       -13.13       -13.31       -13.45       -13.54       -13.60       -13.67       -13.74       -13.81       -13.87
         -13.94       -14.02       -14.15       -14.31       -14.47       -14.62       -14.84       -15.11       -15.61       -16.40
         -16.81       -17.01       -17.13       -17.18       -17.19
0 13     -3.054       -3.914       -5.640       -7.318       -8.651       -10.02       -11.40       -12.08       -12.43       -12.69
         -12.86       -13.03       -13.20       -13.34       -13.42       -13.49       -13.56       -13.62       -13.69       -13.75
         -13.82       -13.90       -14.02       -14.18       -14.33       -14.48       -14.69       -14.96       -15.45       -16.24
         -16.68       -16.91       -17.04       -17.10       -17.12
0 14     -3.064       -3.883       -5.575       -7.239       -8.592       -9.982       -11.35       -12.02       -12.36       -12.61
         -12.78       -12.95       -13.12       -13.25       -13.33       -13.40       -13.46       -13.53       -13.59       -13.66
         -13.72       -13.80       -13.92       -14.07       -14.22       -14.37       -14.58       -14.84       -15.33       -16.12
         -16.59       -16.83       -16.97       -17.03       -17.06
0 15     -3.068       -3.862       -5.534       -7.190       -8.555       -9.957       -11.32       -11.98       -12.31       -12.57
         -12.73       -12.90       -13.06       -13.20       -13.28       -13.34       -13.41       -13.47       -13.53       -13.60
         -13.66       -13.74       -13.86       -14.01       -14.16       -14.30       -14.51       -14.77       -15.25       -16.05
         -16.53       -16.78       -16.92       -16.99       -17.02
0 16     -3.070       -3.845       -5.501       -7.151       -8.525       -9.936       -11.29       -11.95       -12.28       -12.53
         -12.69       -12.86       -13.02       -13.15       -13.23       -13.30       -13.36       -13.42       -13.49       -13.55
         -13.61       -13.69       -13.81       -13.96       -14.10       -14.24       -14.45       -14.71       -15.19       -15.99
         -16.48       -16.74       -16.89       -16.96       -16.99
0 17     -3.072       -3.826       -5.468       -7.112       -8.495       -9.915       -11.27       -11.92       -12.25       -12.49
         -12.66       -12.82       -12.98       -13.11       -13.19       -13.25       -13.31       -13.38       -13.44       -13.50
         -13.56       -13.64       -13.76       -13.91       -14.05       -14.19       -14.40       -14.65       -15.13       -15.93
         -16.43       -16.70       -16.85       -16.93       -16.96
0 18     -3.073       -3.806       -5.434       -7.074       -8.465       -9.893       -11.24       -11.89       -12.21       -12.46
         -12.62       -12.78       -12.94       -13.07       -5.144       -13.21       -13.27       -13.33       -13.39       -13.45
         -13.51       -13.59       -13.71       -13.86       -14.00       -14.14       -14.34       -14.60       -15.07       -15.87
         -16.38       -16.66       -16.82       -16.90       -16.93
0 19     1.0000E+30   -3.785       -5.401       -7.035       -8.435       -9.871       -11.21       -11.85       -12.18       -12.42
         -12.58       -12.74       -12.90       -5.023       -13.10       -13.16       -13.22       -13.29       -13.35       -13.41
         -13.47       -13.54       -13.66       -13.81       -13.95       -14.09       -14.29       -14.54       -15.01       -15.81
         -16.33       -16.62       -16.78       -16.86       -16.90
0 20     -2.476       -3.762       -5.368       -6.997       -8.405       -9.849       -11.19       -11.82       -12.14       -12.38
         -12.54       -12.70       -12.86       -12.98       -13.06       -13.12       -13.18       -13.24       -13.30       -13.36
         -13.42       -13.50       -13.61       -13.76       -13.90       -14.03       -14.23       -14.49       -14.95       -15.76
         -16.29       -16.58       -16.75       -16.83       -16.87
0 21     -2.474       -3.739       -5.334       -6.959       -8.374       -9.826       -11.16       -11.79       -12.11       -12.34
         -12.50       -12.66       -12.81       -12.94       -13.01       -13.08       -13.14       -13.20       -13.26       -13.32
         -13.37       -13.45       -13.56       -13.71       -13.85       -13.98       -14.18       -14.43       -14.90       -15.70
         -16.24       -16.54       -16.71       -16.80       -16.84
0 22     -2.470       -3.709       -5.292       -6.912       -8.336       -9.797       -11.12       -11.75       -12.06       -12.30
         -12.45       -12.61       -12.76       -12.88       -12.96       -13.02       -13.08       -13.14       -13.20       -13.26
         -13.32       -13.39       -13.50       -13.65       -13.78       -13.92       -14.12       -14.36       -14.83       -15.63
         -16.18       -16.49       -16.67       -16.76       -16.80
0 23     -2.461       -3.660       -5.224       -6.836       -8.275       -9.749       -11.07       -11.68       -11.99       -12.22
         -12.38       -12.53       -12.68       -12.80       -12.87       -12.93       -12.99       -13.05       -13.11       -13.17
         -13.23       -13.30       -13.41       -13.55       -13.68       -13.82       -14.01       -14.26       -14.71       -15.52
         -16.09       -16.41       -16.60       -16.69       -16.74
0 24     -2.440       -3.597       -5.139       -6.743       -8.198       -9.686       -10.99       -11.60       -11.90       -12.13
         -12.28       -12.43       -12.58       -12.70       -12.77       -12.83       -12.88       -12.94       -13.00       -13.06
         -5.113       -13.18       -13.29       -13.43       -13.56       -13.69       -13.88       -14.13       -14.58       -15.38
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        -15.97      -16.31      -16.51      -16.62      -16.66
 0 25   -2.411      -3.530      -5.052      -6.650      -8.120      -9.622      -10.92      -11.52      -11.82      -12.04
        -12.19      -12.33      -12.48      -12.59      -12.66      -12.72      -12.78      -12.83      -12.89      -12.95
        -13.00      -13.07      -13.18      -13.31      -13.44      -13.57      -13.76      -14.00      -14.45      -15.25
        -15.86      -16.21      -16.42      -16.54      -16.59
 0 26   -2.374      -3.460      -4.965      -6.557      -8.042      -9.556      -10.84      -11.43      -11.73      -11.95
        -12.09      -12.23      -12.38      -12.49      -12.56      -12.62      -12.67      -12.73      -12.78      -12.84
        -12.89      -12.96      -13.07      -13.20      -13.33      -13.45      -13.64      -13.87      -14.32      -15.12
        -15.74      -16.11      -16.33      -16.46      -16.51
 0 27   -2.307      -3.350      -4.832      -6.418      -7.923      -9.453      -10.73      -11.31      -11.59      -11.81
        -11.95      -12.09      -12.23      -12.34      -12.41      -12.46      -12.52      -12.57      -12.62      -12.68
        -12.73      -12.80      -12.90      -13.03      -13.16      -13.28      -13.46      -13.69      -14.13      -14.93
        -15.58      -15.97      -16.21      -16.34      -16.40
 0 28   -2.188      -3.189      -4.650      -6.233      -7.762      -9.311      -10.57      -11.14      -11.41      -11.62
        -11.76      -11.90      -12.03      -12.14      -12.21      -12.26      -12.31      -12.36      -12.42      -12.47
        -12.52      -12.58      -12.69      -12.81      -12.93      -13.06      -13.23      -13.46      -13.89      -14.69
        -15.36      -15.78      -16.04      -16.18      -16.25
 0 29   -1.892       5.162      -4.272      -5.860      -7.434      -9.015      -10.25      -10.79      -11.06      -3.256
        -11.39      -11.52      -11.65      -11.75      -11.81      -11.86      -11.91      -11.96      -12.01      -12.06
        -12.11      -12.17      -12.27      -12.39      -12.51      -12.62      -12.79      -13.01      -13.42      -14.22
        -14.94      -15.40      -15.70      -15.88      -15.96
 0 30  -0.8491      -1.835      -3.330      -4.994      -6.665      -8.302      -9.502      -10.02      -10.27      -10.45
        -10.58      -10.70      -10.82      -10.91      -10.97      -11.02      -11.07      -11.11      -11.16      -11.21
        -11.25      -11.31      -11.40      -11.51      -11.62      -11.73      -11.89      -12.10      -12.50      -13.29
        -14.07      -14.62      -14.99      -15.21      -15.32
 0 31    1.628      0.1055      -1.810      -3.745      -5.597      -7.334      -8.547      -9.057      -9.305      -9.489
        -9.609      -9.728      -9.846      -9.940      -9.997      -10.04      -10.09      -10.13      -10.18      -10.23
        -10.27      -10.33      -10.41      -10.52      -10.63      -10.74      -10.90      -11.10      -11.49      -12.29
        -13.12      -13.73      -14.16      -14.43      -14.57
 0 32   0.0000E+00   2.642     -0.1192      -2.462      -4.548      -6.422      -7.685      -8.209      -8.464      -8.650
        -8.773      -8.895      -9.014      -9.109      -9.168      -9.215      -9.261      -9.307      -9.353      -9.399
        -9.445      -9.501      -9.591      -9.702      -9.811      -9.918      -10.08      -10.28      -10.68      -11.49
        -12.36      -13.01      -13.48      -13.79      -13.94
 0 33   0.0000E+00  0.0000E+00   1.381      -1.282      -3.601      -5.632      -6.965      -7.512      -7.777      -7.971
        -8.098      -8.223      -8.347      -8.445      -8.506      -8.554      -8.602      -8.649      -8.697      -8.744
        -8.791      -8.849      -8.941      -9.055      -9.167      -9.277      -9.440      -9.651      -10.06      -10.89
        -11.78      -12.47      -12.97      -13.29      -13.45
 0 34    5.240      0.0000E+00   2.228     -0.2643      -2.813      -5.021      -6.432      -7.005      -7.281      -7.482
        -7.615      -7.745      -7.873      -7.974      -8.037      -8.086      -8.136      -8.185      -8.234      -8.283
        -8.331      -8.391      -8.486      -8.603      -8.718      -8.832      -8.999      -9.215      -9.633      -10.48
        -11.39      -12.10      -12.61      -12.95      -13.12
 0 35    4.733       4.234      0.0000E+00  0.0000E+00  -3.223      -4.655      -6.136      -6.729      -7.014      -7.222
        -7.358      -7.491      -7.623      -7.726      -7.790      -7.841      -7.892      -7.942      -7.992      -8.042
        -8.091      -8.152      -8.249      -8.368      -8.486      -8.601      -8.772      -8.992      -9.415      -10.27
        -11.20      -11.91      -12.44      -12.78      -12.95
 0


                          VOLUMETRIC BUDGET FOR ENTIRE MODEL AT END OF TIME STEP 20 IN STRESS PERIOD  1
                          ---------------------------------------------------------------------------
 0                 CUMULATIVE VOLUMES      L**3                                 RATES FOR THIS TIME STEP      L**3/T
                   ------------------                                           ------------------------

                      IN:                                                          IN:
                      ---                                                          ---
                        STORAGE =   0.00000E+00                                      STORAGE =   0.00000E+00
                  CONSTANT HEAD =   0.93674E+06                                CONSTANT HEAD =   0.54210
 0                     TOTAL IN =   0.93674E+06                                     TOTAL IN =   0.54210
 0                   OUT:                                                         OUT:
                     ----                                                         ----
                        STORAGE =   0.00000E+00                                      STORAGE =   0.00000E+00
                  CONSTANT HEAD =   0.93673E+06                                CONSTANT HEAD =   0.54208
 0                    TOTAL OUT =   0.93673E+06                                    TOTAL OUT =   0.54208
 0                     IN - OUT =    16.938                                         IN - OUT =   0.16153E-04
 0         PERCENT DISCREPANCY =               0.00                      PERCENT DISCREPANCY =                0.00


 0

           TIME SUMMARY AT END OF TIME STEP 20 IN STRESS PERIOD  1
                                   SECONDS        MINUTES        HOURS          DAYS          YEARS
                              -----------------------------------------------------------------------
         TIME STEP LENGTH         86400.0        1440.00        24.0000       1.00000      0.273785E-02
       STRESS PERIOD TIME       0.172800E+07     28800.0        480.000       20.0000      0.547570E-01
     TOTAL SIMULATION TIME      0.172800E+07     28800.0        480.000       20.0000      0.547570E-01
 1
```

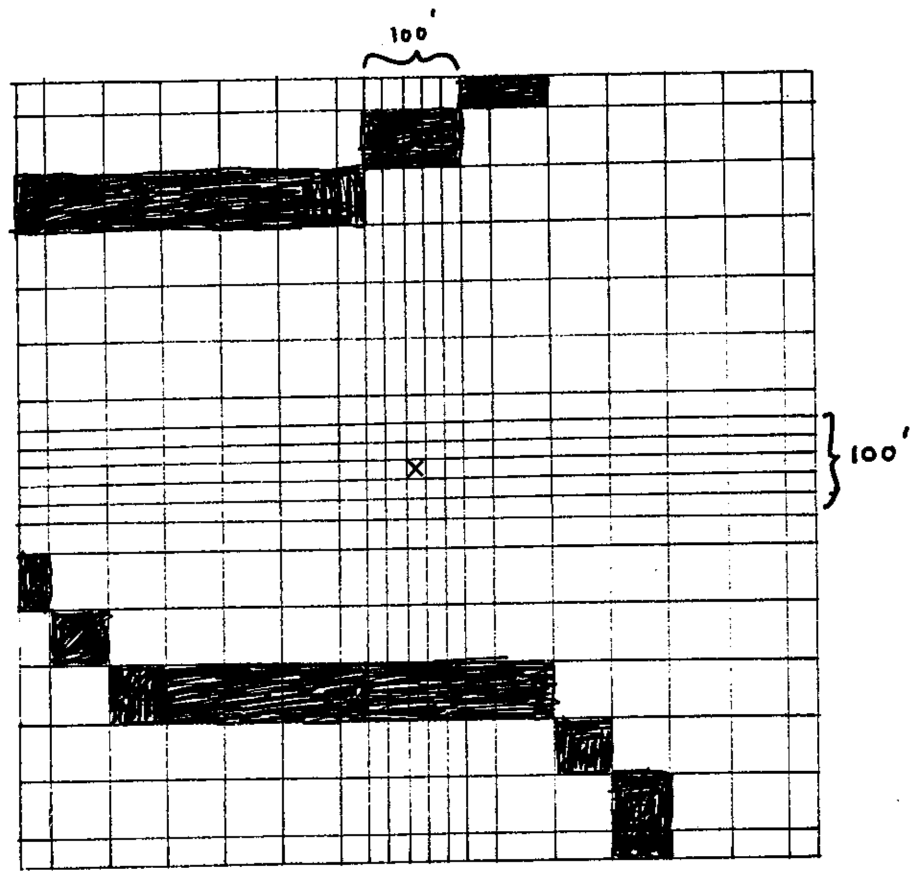
MODFLOW Simulation and Actual Head Comparisons including Simulated Discharge Drawdowns
At 4S (proposed CAP well RW-6)
K=1.5x10e-2 ft/min   Q=7gpm
b = 33 to 60 feet

CELL NUMBER	ACTUAL HEAD	SIMULATED STEADY-STATE HEAD	HEAD DIFFERENCE	SIMULATED PUMPING HEAD	SIMULATED DRAWDOWN	RADIAL DISTANCE	CONSTANT HEAD CELL
1,1	872	893.3	21.3	893.3	0	560	NO
1,37	902	895.5	-6.5	895.4	-0.1	560	NO
5,5	879.5	890.2	10.7	890.1	-0.1	240	NO
5,33	894	893.8	-0.2	893.6	-0.2	240	NO
8,8	886	889.2	3.2	888.8	-0.4	65	NO
8,30	888	890.4	2.4	890	-0.4	65	NO
10,10	886.5	889	2.5	888.5	-0.5	38	NO
10,28	887.5	889.8	2.3	889.1	-0.7	38	NO
14,14	887	888.9	1.9	888.1	-0.8	12	NO
14,24	886.7	889.1	2.4	887.5	-1.6	12	NO
19,19	886.9	888.8	1.9	887.1	-1.7	0	NO
24,14	886.7	888.5	1.8	887.7	-0.8	12	NO
24,24	887.1	888.7	1.6	888	-0.7	12	NO
28,10	886	887.8	1.8	887.3	-0.5	38	NO
28,28	887	888.6	1.6	888.1	-0.5	38	NO
30,8	885.4	887.1	1.7	886.7	-0.4	65	NO
30,30	887.3	888.5	1.2	888.2	-0.3	65	NO
33,5	877.5	881.5	4	881.4	-0.1	240	NO
33,33	889	888.9	-0.1	888.8	-0.1	240	NO
37,1	872.5	877.9	5.4	877.9	0	560	NO
37,37	897	890.4	-6.6	890.4	0	560	NO

NOTES:
1. Cell Number - row then column for (i,j) notation.
2. Actual Head - interpolated from 8/21/91 water table map at block centered (i,j) location.
3. Simulated Steady-State Head - MODFLOW Simulated Head without discharge stress from pumping well.
4. Head Difference - MODFLOW Simulated Steady-State Head minus Actual Head.
5. Simulated Pumping Head - MODFLOW Simulated Head with discharge stress from pumping well located at (i,j)=(19,19).
6. Simulated Drawdown - MODFLOW Simulated Pumping Head minus MODFLOW Simulated Steady-State Head.
7. Radial Distance - (i,j) block centered distance from discharge (i,j) cell.
8. Constant Head Cell - cell that corresponds to known hydrogeologic constant head boundaries such as a stream or creek.
9. Estimated Recovery Head - Actual Head minus Simulated Drawdown.

@ 4S/4D

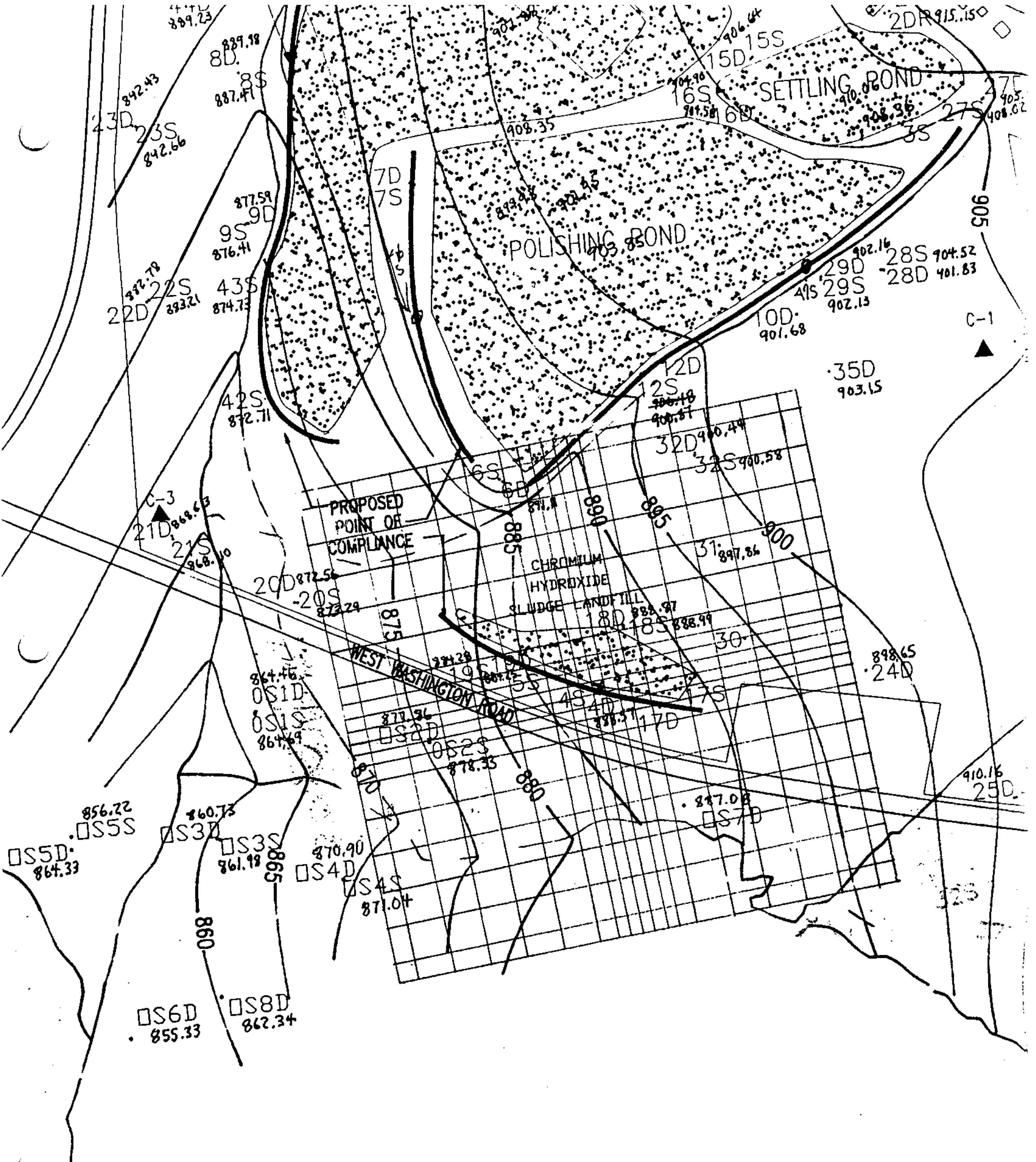
NOTE: FINE DISCRETISATION OF GRID IN THE CENTRAL 100 FEET ZONE NOT DRAWN FOR CLARITY. THIS ZONE WAS DISCRETISED FROM 10 FEET TO 2 FEET



☒ – PUMPING WELL

■ – CONSTANT HEAD BOUNDARIES

☐ – VARIABLE HEADS



SETTLING POND
POLISHING POND
PROPOSED POINT OF COMPLIANCE
CHROMIUM HYDROXIDE SLUDGE LANDFILL
WEST WASHINGTON ROAD
C-1
C-3
2DR 915.15
15D 15S
16S 904.90
6D
27S
3S
8D 889.98
8S 887.41
23D 842.43
23S 842.66
7D
7S
9D 877.59
9S 876.41
22S 882.78
22D 883.21
43S 874.73
42S 872.71
28S 904.52
28D 401.83
29D
29S 902.13
41S
10D 901.68
35D 903.15
12D
12S
32D 900.44
32S 900.58
6S
6D
21D 868.63
21S 868.10
20D 872.56
20S 873.29
31 897.86
18D 888.87
18S 888.99
30
24D 898.65
19
5S
4S
4D
17D
0S1D 864.46
0S1S 864.69
0S2D 877.36
0S2S 878.35
25D 910.16
0S7D 887.08
0S5S 856.22
0S5D 864.33
0S3D 860.73
0S3S 861.98
0S4D 870.90
0S4S 871.04
0S6D 855.33
0S8D 862.34
860
865
870
875
880
885
890
895
900
905

45/D
with PUMPING WELL
K= 0.015 feet/minute
or
1.5×10^{-2} feet/minute

```
1                     U.S. GEOLOGICAL SURVEY MODULAR FINITE-DIFFERENCE GROUND-WATER MODEL
0BONMOD1 1 layer, 37 rows, 37 columns, 1 well                        unconfined, impermeable bedrock
    1 LAYERS         37 ROWS          37 COLUMNS
   1 STRESS PERIOD(S) IN SIMULATION
 MODEL TIME UNIT IS SECONDS
0I/O UNITS:
 ELEMENT OF IUNIT:  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
        I/O UNIT: 11 12  0  0  0  0  0  0 19  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0BAS1 -- BASIC MODEL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT  1
 ARRAYS RHS AND BUFF WILL SHARE MEMORY.
 START HEAD WILL BE SAVED
    12399 ELEMENTS IN X ARRAY ARE USED BY BAS
    12399 ELEMENTS OF X ARRAY USED OUT OF    30000
0BCF1 -- BLOCK-CENTERED FLOW PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 11
 STEADY-STATE SIMULATION
      LAYER  AQUIFER TYPE
      -------------------
        1        1
     2739 ELEMENTS IN X ARRAY ARE USED BY BCF
    15138 ELEMENTS OF X ARRAY USED OUT OF    30000
0WEL1 -- WELL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM 12
 MAXIMUM OF     1 WELLS
        4 ELEMENTS IN X ARRAY ARE USED FOR WELLS
    15142 ELEMENTS OF X ARRAY USED OUT OF    30000
0SIP1 -- STRONGLY IMPLICIT PROCEDURE SOLUTION PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 19
 MAXIMUM OF 100 ITERATIONS ALLOWED FOR CLOSURE
  5 ITERATION PARAMETERS
     5881 ELEMENTS IN X ARRAY ARE USED BY SIP
    21023 ELEMENTS OF X ARRAY USED OUT OF    30000
1BONMOD1 1 layer, 37 rows, 37 columns, 0 abstraction well                unconfined, impermeable bedrock
0
```

BOUNDARY ARRAY FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (37I2)

	1 31	2 32	3 33	4 34	5 35	6 36	7 37	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
0 1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	-1	-1	1	1	1	1	1																							
0 2	1	1	1	1	1	1	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	1	1	1	1	1	1	1																							
0 3	-1	-1	-1	-1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 32	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 33	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 34	1	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	1	1	1	1	1																							
0 35	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

	1	1	-1	-1	1	1	1																							
0 36	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	-1	1	1	-1																							
0 37	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	-1	1	-1	1																							

0AQUIFER HEAD WILL BE SET TO 999.90 AT ALL NO-FLOW NODES (IBOUND=0).
0

INITIAL HEAD FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (37F5.0)

	1 16 31	2 17 32	3 18 33	4 19 34	5 20 35	6 21 36	7 22 37	8 23	9 24	10 25	11 26	12 27	13 28	14 29	15 30
0 1	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	900.0	900.0	880.0	880.0	880.0	880.0	880.0								
0 2	880.0	880.0	880.0	880.0	880.0	880.0	880.0	900.0	900.0	900.0	900.0	900.0	900.0	900.0	900.0
	900.0	900.0	900.0	900.0	900.0	900.0	900.0	900.0	900.0	900.0	900.0	900.0	900.0	900.0	900.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 3	893.0	897.0	889.0	887.0	893.0	894.0	895.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 4	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 5	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 6	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 7	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 8	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 9	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 10	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 11	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 12	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 13	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 14	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 15	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 16	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 17	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 18	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 19	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 20	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 21	800.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 22	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 23	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 24	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 25	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 26	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	888.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 27	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 28	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 29	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 30	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 31	880.0	888.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0

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       880.0  880.0  880.0  880.0  880.0  880.0  880.0
 0 32  873.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0
       880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0
       880.0  880.0  880.0  880.0  880.0  880.0  880.0
 0 33  880.0  875.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0
       880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0
       880.0  880.0  880.0  880.0  880.0  880.0  880.0
 0 34  880.0  880.0  877.0  879.0  880.0  881.0  882.0  882.0  882.0  882.0  882.0  883.0  883.0  884.0  884.0
       884.0  884.0  884.0  884.0  884.0  884.0  884.0  884.0  884.0  884.0  884.0  884.0  884.0  884.0  884.0
       885.0  887.0  880.0  880.0  880.0  880.0  880.0
 0 35  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0
       880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0
       880.0  880.0  889.0  889.0  880.0  880.0  880.0
 0 36  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0
       880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0
       880.0  880.0  880.0  891.0  880.0  880.0  899.0
 0 37  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0
       880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0  880.0
       880.0  880.0  880.0  880.0  880.0  880.0  880.0
0DEFAULT OUTPUT CONTROL -- THE FOLLOWING OUTPUT COMES AT THE END OF EACH STRESS PERIOD:
 TOTAL VOLUMETRIC BUDGET
          HEAD
          DRAWDOWN
0                                         COLUMN TO ROW ANISOTROPY =   1.000000
0

                                     DELR WILL BE READ ON UNIT 11 USING FORMAT:          (37F6.3)
                               ------------------------------------------------------------------

  60.000      60.000      60.000      60.000      60.000      60.000      30.000      10.000      10.000      5.0000
  5.0000      5.0000      5.0000      3.0000      2.0000      2.0000      2.0000      0.67000     0.67000     0.67000
  2.0000      2.0000      2.0000      3.0000      5.0000      5.0000      5.0000      5.0000      10.000      10.000
  30.000      60.000      60.000      60.000      60.000      60.000      60.000
0

                                     DELC WILL BE READ ON UNIT 11 USING FORMAT:          (37F6.3)
                               ------------------------------------------------------------------

  60.000      60.000      60.000      60.000      60.000      60.000      30.000      10.000      10.000      5.0000
  5.0000      5.0000      5.0000      3.0000      2.0000      2.0000      2.0000      0.67000     0.67000     0.67000
  2.0000      2.0000      2.0000      3.0000      5.0000      5.0000      5.0000      5.0000      10.000      10.000
  30.000      60.000      60.000      60.000      60.000      60.000      60.000
0                                         HYD. COND. ALONG ROWS =  0.2500000E-03 FOR LAYER  1
0                                                      BOTTOM =    840.0000      FOR LAYER  1
0


                                          SOLUTION BY THE STRONGLY IMPLICIT PROCEDURE
                                          -------------------------------------------
0                                 MAXIMUM ITERATIONS ALLOWED FOR CLOSURE =       100
                                                  ACCELERATION PARAMETER =     1.0000
                                      HEAD CHANGE CRITERION FOR CLOSURE =    0.10000E-02
                                      SIP HEAD CHANGE PRINTOUT INTERVAL =         1
0
   5 ITERATION PARAMETERS CALCULATED FROM SPECIFIED WSEED = 0.00100000 :

          0.0000000E+00  0.8221720E+00  0.9683772E+00  0.9943766E+00  0.9990000E+00
1                                          STRESS PERIOD NO.    1, LENGTH =     1728000.
                                           ----------------------------------------------

                                           NUMBER OF TIME STEPS =     20

                                            MULTIPLIER FOR DELT =     1.000

                                         INITIAL TIME STEP SIZE =     86400.00

0            1 WELLS
                                        LAYER    ROW    COL    STRESS RATE   WELL NO.
                                        ----------------------------------------------
                                          1      19     19    -0.16000E-01      1
0**********NODE   1  21   1 (LAYER,ROW,COL) WENT DRY AT ITERATION =  1  TIME STEP =  1  STRESS PERIOD =  1
0
   27 ITERATIONS FOR TIME STEP   1 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
    19.31      (  1,  1, 30)   7.961      (  1,  1,  7)   4.373      (  1,  3, 37)   7.456      (  1,  3, 37)   5.552      (  1, 12, 25)
  -0.6601      (  1,  6,  8) -0.4221      (  1,  7,  8) -0.4985      (  1,  8, 10)  0.6906      (  1, 19, 18)  0.9114      (  1, 14, 26)
   0.9295E-01 (  1,  6,  8) -0.7473E-01 (  1,  1, 37)  0.7787E-01 (  1,  9, 15) -0.1348      (  1, 26, 16) -0.9816E-01 (  1, 17, 10)
  -0.2227E-01 (  1, 27,  7)  0.1694E-01 (  1, 26, 14)  0.2111E-01 (  1, 26, 16)  0.2268E-01 (  1, 26, 18)  0.1875E-01 (  1, 15, 18)
   0.4274E-02 (  1, 22,  7) -0.4244E-02 (  1, 25, 11) -0.3975E-02 (  1, 20, 14) -0.6934E-02 (  1, 19, 15) -0.6428E-02 (  1, 11, 12)
  -0.1170E-02 (  1,  7, 20)  0.9705E-03 (  1, 14, 15)
0
    1 ITERATIONS FOR TIME STEP   2 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.2554E-03 (  1, 14, 19)
0
    1 ITERATIONS FOR TIME STEP   3 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.2005E-03 (  1, 15, 18)
0
    1 ITERATIONS FOR TIME STEP   4 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.1740E-03 (  1, 15, 17)
0
    1 ITERATIONS FOR TIME STEP   5 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.1557E-03 (  1, 16, 17)
0
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     1 ITERATIONS FOR TIME STEP   6 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.1403E-03 (  1, 16, 17)
0
     1 ITERATIONS FOR TIME STEP   7 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.1285E-03 (  1, 17, 18)
0
     1 ITERATIONS FOR TIME STEP   8 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.1191E-03 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP   9 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.1105E-03 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP  10 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.1023E-03 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP  11 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.9478E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP  12 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.8772E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP  13 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.8126E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP  14 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.7535E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP  15 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.6979E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP  16 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.6478E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP  17 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.6033E-04 (  1, 19, 19)
0
     1 ITERATIONS FOR TIME STEP  18 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.5599E-04 (  1, 19, 19)
0
     1 ITERATIONS FOR TIME STEP  19 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.5207E-04 (  1, 19, 18)
0
     1 ITERATIONS FOR TIME STEP  20 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.4868E-04 (  1, 19, 19)
0
1                    HEAD IN LAYER  1 AT END OF TIME STEP 20 IN STRESS PERIOD  1
          ------------------------------------------------------------

               1          2          3          4          5          6          7          8          9         10
              11         12         13         14         15         16         17         18         19         20
              21         22         23         24         25         26         27         28         29         30
              31         32         33         34         35         36         37
 ...............................................................................................................
0  1      893.3      893.3      892.5      892.7      894.1      896.1      897.7      898.4      898.6      898.8
          898.9      899.0      899.1      899.2      899.2      899.2      899.3      899.3      899.3      899.3
          899.3      899.4      899.4      899.4      899.5      899.5      899.6      899.6      899.7      899.8
          900.0      900.0      898.0      896.8      896.0      895.6      895.4
0  2      893.4      893.9      891.7      891.3      893.6      895.7      898.3      900.0      900.0      900.0
          900.0      900.0      900.0      900.0      900.0      900.0      900.0      900.0      900.0      900.0
          900.0      900.0      900.0      900.0      900.0      900.0      900.0      900.0      900.0      900.0
          899.3      898.4      897.2      896.3      895.7      895.3      895.2
0  3      893.0      897.0      889.0      887.0      893.0      894.0      895.0      895.7      896.0      896.2
          896.3      896.4      896.5      896.6      896.6      896.6      896.7      896.7      896.7      896.7
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	896.7	896.7	896.8	896.8	896.8	896.9	896.9	896.9	896.9	896.9
	896.9	896.6	896.0	895.5	895.1	894.9	894.8			
0 4	891.8	892.2	890.0	889.4	891.3	892.5	893.4	893.8	893.9	894.1
	894.1	894.2	894.3	894.3	894.4	894.4	894.4	894.4	894.4	894.4
	894.5	894.5	894.5	894.5	894.6	894.6	894.7	894.7	894.8	894.8
	894.9	895.0	894.8	894.6	894.4	894.3	894.3			
0 5	890.0	889.9	889.2	889.2	890.1	891.1	891.8	892.1	892.2	892.3
	892.4	892.4	892.5	892.5	892.6	892.6	892.6	892.6	892.6	892.6
	892.7	892.7	892.7	892.7	892.8	892.8	892.9	892.9	893.0	893.1
	893.2	893.5	893.6	893.7	893.7	893.7	893.7			
0 6	888.2	888.0	887.9	888.1	888.8	889.6	890.2	890.5	890.6	890.7
	890.8	890.8	890.9	890.9	891.0	891.0	891.0	891.0	891.0	891.0
	891.1	891.1	891.1	891.1	891.2	891.2	891.3	891.4	891.4	891.5
	891.7	892.1	892.5	892.7	892.9	893.0	893.1			
0 7	887.0	886.5	886.5	887.0	887.7	888.5	889.1	889.3	889.5	889.5
	889.6	889.7	889.7	889.8	889.8	889.8	889.9	889.9	889.9	889.9
	889.9	889.9	890.0	890.0	890.0	890.1	890.2	890.2	890.3	890.5
	890.7	891.2	891.7	892.1	892.4	892.6	892.7			
0 8	886.6	885.7	885.8	886.4	887.2	888.0	888.6	888.8	888.9	889.0
	889.1	889.1	889.2	889.2	889.3	889.3	889.3	889.3	889.4	889.4
	889.4	889.4	889.4	889.5	889.5	889.6	889.7	889.7	889.8	890.0
	890.3	890.8	891.4	891.8	892.2	892.4	892.5			
0 9	886.4	885.2	885.5	886.1	886.9	887.7	888.3	888.5	888.7	888.7
	888.8	888.9	888.9	889.0	889.0	889.0	889.0	889.1	889.1	889.1
	889.1	889.1	889.2	889.2	889.3	889.3	889.4	889.5	889.6	889.8
	890.0	890.6	891.2	891.7	892.1	892.3	892.4			
0 10	886.3	884.9	885.2	885.9	886.7	887.5	888.1	888.4	888.5	888.5
	888.6	888.6	888.7	888.7	888.8	888.8	888.8	888.8	888.9	888.9
	888.9	888.9	888.9	889.0	889.0	889.1	889.2	889.3	889.4	889.6
	889.9	890.5	891.1	891.6	892.0	892.2	892.3			
0 11	886.2	884.6	885.0	885.7	886.5	887.4	888.0	888.2	888.3	888.4
	888.5	888.5	888.6	888.6	888.6	888.6	888.7	888.7	888.7	888.7
	888.7	888.8	888.8	888.8	888.9	889.0	889.1	889.2	889.3	889.5
	889.8	890.4	891.0	891.5	891.9	892.2	892.3			
0 12	886.1	884.4	884.8	885.5	886.4	887.3	887.9	888.1	888.2	888.3
	888.3	888.4	888.4	888.4	888.5	888.5	888.5	888.5	888.5	888.5
	888.6	888.6	888.6	888.7	888.8	888.9	888.9	889.0	889.2	889.4
	889.7	890.3	891.0	891.5	891.9	892.1	892.3			
0 13	886.1	884.1	884.6	885.4	886.3	887.2	887.7	888.0	888.1	888.1
	888.2	888.2	888.2	888.3	888.3	888.3	888.3	888.3	888.4	888.4
	888.4	888.4	888.5	888.5	888.6	888.7	888.8	888.9	889.1	889.2
	889.6	890.2	890.9	891.4	891.8	892.1	892.2			
0 14	886.1	883.8	884.4	885.3	886.2	887.0	887.6	887.9	888.0	888.0
	888.1	888.1	888.1	888.1	888.1	888.1	888.2	888.2	888.2	888.2
	888.2	888.3	888.3	888.4	888.5	888.6	888.7	888.8	889.0	889.2
	889.5	890.1	890.8	891.4	891.8	892.1	892.2			
0 15	886.0	883.7	884.3	885.2	886.1	887.0	887.6	887.8	887.9	888.0
	888.0	888.0	888.0	888.0	888.0	888.0	888.0	888.0	888.1	888.1
	888.1	888.1	888.2	888.3	888.4	888.5	888.7	888.8	888.9	889.1
	889.4	890.1	890.8	891.3	891.8	892.0	892.2			
0 16	886.0	883.5	884.2	885.1	886.0	886.9	887.5	887.8	887.9	887.9
	888.0	888.0	888.0	888.0	888.0	887.9	887.9	887.9	887.9	887.9
	888.0	888.1	888.1	888.2	888.4	888.5	888.6	888.7	888.9	889.1
	889.4	890.1	890.8	891.3	891.7	892.0	892.2			
0 17	886.0	883.4	884.2	885.1	886.0	886.9	887.5	887.7	887.8	887.9
	887.9	887.9	887.9	887.9	887.9	887.8	887.8	887.7	887.7	887.7
	887.8	888.0	888.1	888.2	888.3	888.4	888.6	888.7	888.8	889.0
	889.4	890.0	890.7	891.3	891.7	892.0	892.2			
0 18	886.0	883.3	884.1	885.0	886.0	886.9	887.5	887.7	887.8	887.8
	887.9	887.9	887.9	887.9	887.8	887.8	887.7	887.5	887.4	887.5
	887.7	887.9	888.0	888.1	888.3	888.4	888.5	888.7	888.8	889.0
	889.3	890.0	890.7	891.3	891.7	892.0	892.1			
0 19	886.0	883.3	884.1	885.0	885.9	886.8	887.4	887.7	887.8	887.8
	887.9	887.9	887.9	887.9	887.8	887.8	887.7	887.4	887.1	887.4
	887.7	887.9	888.0	888.1	888.3	888.4	888.5	888.6	888.8	889.0
	889.3	890.0	890.7	891.3	891.7	892.0	892.1			
0 20	886.0	883.2	884.0	885.0	885.9	886.8	887.4	887.7	887.8	887.8
	887.8	887.9	887.9	887.9	887.8	887.8	887.6	887.5	887.4	887.5
	887.7	887.9	888.0	888.1	888.2	888.4	888.5	888.6	888.8	889.0
	889.3	890.0	890.7	891.3	891.7	892.0	892.1			
0 21	~~1.0000E+30~~	883.1	884.0	884.9	885.9	886.8	887.4	887.6	887.7	887.8
	887.8	887.8	887.8	887.8	887.8	887.7	887.7	887.6	887.6	887.7
	887.7	887.9	888.0	888.1	888.2	888.4	888.5	888.6	888.8	888.9
	889.3	890.0	890.7	891.2	891.7	892.0	892.1			
0 22	878.5	883.0	883.9	884.9	885.8	886.7	887.3	887.6	887.7	887.7
	887.8	887.8	887.8	887.8	887.8	887.8	887.7	887.7	887.7	887.8
	887.8	887.9	888.0	888.0	888.2	888.3	888.4	888.6	888.7	888.9
	889.2	889.9	890.6	891.2	891.7	892.0	892.1			
0 23	878.5	882.8	883.8	884.8	885.8	886.7	887.3	887.5	887.6	887.7
	887.7	887.8	887.8	887.8	887.8	887.8	887.8	887.8	887.8	887.8
	887.8	887.9	887.9	888.0	888.1	888.3	888.4	888.5	888.7	888.9
	889.2	889.9	890.6	891.2	891.6	891.9	892.1			
0 24	878.5	882.6	883.7	884.7	885.7	886.6	887.2	887.5	887.6	887.6
	887.7	887.7	887.7	887.7	887.8	887.8	887.8	887.8	887.8	887.8
	887.8	887.9	887.9	888.0	888.1	888.2	888.4	888.5	888.6	888.8
	889.2	889.8	890.6	891.2	891.6	891.9	892.1			
0 25	878.4	882.4	883.6	884.6	885.6	886.5	887.1	887.4	887.5	887.6
	887.6	887.6	887.7	887.7	887.7	887.7	887.8	887.8	887.8	887.8
	887.8	887.9	887.9	888.0	888.1	888.2	888.3	888.4	888.5	888.7
	889.1	889.8	890.5	891.1	891.6	891.9	892.1			
0 26	878.4	882.1	883.3	884.4	885.4	886.4	887.0	887.3	887.4	887.5
	887.5	887.6	887.6	887.7	887.7	887.7	887.7	887.7	887.8	887.8
	887.8	887.8	887.9	887.9	888.0	888.1	888.2	888.3	888.5	888.6
	889.0	889.7	890.5	891.1	891.5	891.9	892.0			
0 27	878.3	881.7	883.1	884.3	885.3	886.3	886.9	887.2	887.3	887.4
	887.4	887.5	887.5	887.6	887.6	887.6	887.7	887.7	887.7	887.7
	887.7	887.8	887.8	887.8	887.9	888.0	888.1	888.2	888.4	888.5
	888.9	889.6	890.4	891.0	891.5	891.8	892.0			
0 28	878.1	881.4	882.9	884.1	885.2	886.1	886.8	887.1	887.2	887.3
	887.3	887.4	887.5	887.5	887.5	887.6	887.6	[illegible]	887.6	887.6
	887.7	887.7	887.7	887.8	887.8	887.9	888.0	888.1	888.3	888.5
	888.8	889.5	890.3	891.0	891.4	891.8	892.0			
0 29	877.9	881.0	882.6	883.9	885.0	886.0	886.6	886.9	887.0	887.1
	887.2	887.3	887.3	887.4	887.4	887.5	887.5	887.5	887.5	887.5
	887.6	887.6	887.6	887.7	887.7	887.8	887.9	888.0	888.1	888.3
	888.7	889.4	890.2	890.9	891.4	891.7	891.9			
0 30	877.5	880.4	882.2	883.6	884.7	885.7	886.4	886.7	886.8	886.9
	887.0	887.1	887.2	887.2	887.3	887.3	887.3	887.3	887.4	887.4

constant head erroneously set at 600 instead of 550

PUMPING WELL

888.8
-887.1
1.7' of drawdown.

	887.4	887.4	887.5	887.5	887.6	887.7	887.7	887.8	888.0	888.2
	888.5	889.3	890.1	890.8	891.3	891.7	891.9			
0 31	876.5	879.4	881.4	882.9	884.1	885.2	885.9	886.3	886.4	886.5
	886.6	886.7	886.8	886.9	886.9	886.9	887.0	887.0	887.0	887.0
	887.0	887.1	887.1	887.1	887.2	887.3	887.4	887.5	887.6	887.8
	888.2	888.9	889.8	890.6	891.1	891.6	891.8			
0 32	873.0	877.1	879.7	881.5	882.9	884.1	884.9	885.3	885.5	885.6
	885.7	885.8	885.9	886.0	886.0	886.1	886.1	886.1	886.1	886.1
	886.2	886.2	886.2	886.3	886.4	886.5	886.6	886.7	886.8	887.0
	887.4	888.3	889.3	890.1	890.8	891.4	891.7			
0 33	874.7	875.0	878.0	880.0	881.4	882.6	883.5	883.9	884.1	884.2
	884.3	884.5	884.6	884.7	884.7	884.8	884.8	884.9	884.9	884.9
	884.9	885.0	885.0	885.1	885.1	885.3	885.4	885.5	885.6	885.9
	886.3	887.5	888.8	889.7	890.6	891.3	891.9			
0 34	876.0	876.4	877.0	879.0	880.0	881.0	882.0	882.0	882.0	882.0
	882.0	883.0	883.0	884.0	884.0	884.0	884.0	884.0	884.0	884.0
	884.0	884.0	884.0	884.0	884.0	884.0	884.0	884.0	884.0	884.0
	885.0	887.0	888.6	889.4	890.4	891.5	892.6			
0 35	877.0	877.3	878.0	879.2	880.2	881.3	882.2	882.6	882.8	883.0
	883.1	883.2	883.3	883.4	883.5	883.5	883.6	883.6	883.6	883.7
	883.7	883.7	883.8	883.8	883.9	884.0	884.2	884.3	884.5	884.7
	885.3	886.7	889.0	889.0	889.9	891.6	894.5			
0 36	877.6	877.9	878.6	879.5	880.4	881.5	882.3	882.7	882.9	883.1
	883.2	883.3	883.4	883.5	883.5	883.5	883.6	883.6	883.6	883.6
	883.6	883.7	883.7	883.8	883.9	884.0	884.1	884.2	884.3	884.5
	885.0	886.0	887.6	891.0	888.7	890.3	899.0			
0 37	877.9	878.2	878.8	879.6	880.5	881.6	882.4	882.7	882.9	883.0
	883.1	883.2	883.3	883.3	883.4	883.4	883.5	883.5	883.5	883.5
	883.5	883.6	883.6	883.6	883.7	883.8	883.9	883.9	884.1	884.2
	884.5	884.9	884.3	880.0	883.1	880.0	890.4			

30,30

1 DRAWDOWN IN LAYER 1 AT END OF TIME STEP 20 IN STRESS PERIOD 1

	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
	21	22	23	24	25	26	27	28	29	30
	31	32	33	34	35	36	37			
0 1	-13.33	-13.25	-12.55	-12.66	-14.11	-16.06	-17.73	-18.37	-18.64	-18.81
	-18.91	-19.01	-19.10	-19.17	-19.21	-19.24	-19.27	-19.29	-19.30	-19.31
	-19.33	-19.36	-19.39	-19.42	-19.47	-19.53	-19.59	-19.64	-19.72	-19.82
	0.0000E+00	0.0000E+00	-18.01	-16.79	-16.03	-15.58	-15.37			
0 2	-13.40	-13.88	-11.71	-11.30	-13.56	-15.72	-18.28	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	-19.31	-18.37	-17.20	-16.31	-15.71	-15.34	-15.16			
0 3	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-15.75	-16.05	-16.23
	-16.34	-16.44	-16.52	-16.59	-16.62	-16.65	-16.68	-16.69	-16.70	-16.71
	-16.72	-16.75	-16.77	-16.79	-16.83	-16.86	-16.89	-16.92	-16.94	-16.95
	-16.90	-16.61	-16.05	-15.54	-15.15	-14.89	-14.77			
0 4	-11.75	-12.23	-9.987	-9.397	-11.28	-12.52	-13.39	-13.76	-13.93	-14.06
	-14.13	-14.21	-14.28	-14.33	-14.36	-14.39	-14.41	-14.43	-14.43	-14.44
	-14.46	-14.48	-14.50	-14.53	-14.57	-14.61	-14.66	-14.70	-14.75	-14.81
	-14.90	-14.95	-14.82	-14.62	-14.44	-14.32	-14.25			
0 5	-9.974	-9.887	-9.247	-9.222	-10.11	-11.08	-11.77	-12.06	-12.20	-12.30
	-12.37	-12.43	-12.49	-12.54	-12.57	-12.59	-12.61	-12.63	-12.64	-12.64
	-12.66	-12.68	-12.70	-12.73	-12.77	-12.82	-12.87	-12.92	-12.99	-13.07
	-13.22	-13.47	-13.62	-13.67	-13.68	-13.67	-13.67			
0 6	-8.220	-7.997	-7.863	-8.120	-8.796	-9.614	-10.23	-10.49	-10.61	-10.71
	-10.77	-10.83	-10.89	-10.94	-10.97	-10.99	-11.02	-11.03	-11.04	-11.05
	-11.06	-11.09	-11.11	-11.14	-11.18	-11.24	-11.30	-11.35	-11.43	-11.54
	-11.73	-12.12	-12.49	-12.75	-12.91	-13.02	-13.07			
0 7	-7.038	-6.469	-6.503	-6.955	-7.676	-8.487	-9.077	-9.328	-9.452	-9.544
	-9.606	-9.668	-9.730	-9.780	-9.812	-9.837	-9.862	-9.879	-9.887	-9.896
	-9.913	-9.938	-9.964	-9.995	-10.05	-10.11	-10.17	-10.24	-10.34	-10.46
	-10.71	-11.21	-11.72	-12.11	-12.38	-12.56	-12.66			
0 8	-6.597	-5.671	-5.814	-6.381	-7.153	-7.980	-8.566	-8.808	-8.926	-9.015
	-9.074	-9.134	-9.195	-9.245	-9.276	-9.302	-9.328	-9.345	-9.354	-9.363
	-9.381	-9.408	-9.435	-9.469	-9.525	-9.596	-9.667	-9.740	-9.848	-9.990
	-10.27	-10.82	-11.40	-11.84	-12.16	-12.38	-12.49			
0 9	-6.400	-5.234	-5.452	-6.084	-6.886	-7.725	-8.310	-8.547	-8.662	-8.746
	-8.802	-8.860	-8.918	-8.967	-8.998	-9.024	-9.050	-9.068	-9.077	-9.086
	-9.104	-9.132	-9.160	-9.196	-9.255	-9.332	-9.409	-9.487	-9.603	-9.755
	-10.05	-10.63	-11.24	-11.71	-12.05	-12.28	-12.40			
0 10	-6.276	-4.875	-5.170	-5.857	-6.684	-7.534	-8.120	-8.353	-8.464	-8.543
	-8.596	-8.648	-8.702	-8.748	-8.778	-8.803	-8.829	-8.847	-8.856	-8.866
	-8.884	-8.913	-8.943	-8.982	-9.046	-9.129	-9.213	-9.297	-9.422	-9.582
	-9.888	-10.49	-11.12	-11.61	-11.97	-12.22	-12.34			
0 11	-6.203	-4.622	-4.979	-5.704	-6.549	-7.406	-7.994	-8.224	-8.332	-8.408
	-8.457	-8.505	-8.555	-8.597	-8.626	-8.650	-8.675	-8.693	-8.702	-8.712
	-8.731	-8.761	-8.793	-8.834	-8.902	-8.991	-9.081	-9.170	-9.301	-9.468
	-9.783	-10.40	-11.04	-11.54	-11.92	-12.17	-12.31			
0 12	-6.140	-4.353	-4.783	-5.549	-6.412	-7.279	-7.869	-8.097	-8.202	-8.273
	-8.318	-8.361	-8.403	-8.439	-8.464	-8.486	-8.510	-8.528	-8.538	-8.547
	-8.567	-8.599	-8.633	-8.679	-8.755	-8.853	-8.950	-9.045	-9.183	-9.355
	-9.679	-10.31	-10.97	-11.48	-11.87	-12.13	-12.27			
0 13	-6.090	-4.067	-4.585	-5.393	-6.276	-7.151	-7.745	-7.971	-8.074	-8.141
	-8.181	-8.216	-8.248	-8.273	-8.291	-8.308	-8.329	-8.346	-8.355	-8.365
	-8.386	-8.422	-8.462	-8.515	-8.604	-8.714	-8.820	-8.922	-9.066	-9.244
	-9.576	-10.22	-10.89	-11.42	-11.82	-12.09	-12.23			
0 14	-6.060	-3.823	-4.424	-5.267	-6.166	-7.050	-7.646	-7.873	-7.974	-8.038
	-8.075	-8.104	-8.124	-8.133	-8.138	-8.145	-8.158	-8.173	-8.182	-8.193
	-8.216	-8.261	-8.312	-8.378	-8.484	-8.607	-8.720	-8.826	-8.976	-9.158
	-9.495	-10.15	-10.83	-11.37	-11.78	-12.06	-12.20			
0 15	-6.046	-3.663	-4.323	-5.188	-6.098	-6.986	-7.585	-7.812	-7.913	-7.975
	-8.010	-8.036	-8.049	-8.045	-8.038	-8.032	-8.032	-8.043	-8.051	-8.063
	-8.090	-8.149	-8.212	-8.292	-8.411	-8.542	-8.660	-8.769	-8.921	-9.105
	-9.445	-10.10	-10.80	-11.34	-11.75	-12.04	-12.19			
0 16	-6.038	-3.532	-4.241	-5.125	-6.043	-6.935	-7.536	-7.764	-7.865	-7.926
	-7.960	-7.984	-7.992	-7.978	-7.958	-7.936	-7.914	-7.914	-7.920	-7.934
	-7.973	-8.053	-8.133	-8.226	-8.356	-8.492	-8.613	-8.723	-8.877	-9.063
	-9.405	-10.07	-10.77	-11.32	-11.73	-12.02	-12.17			
0 17	-6.032	-3.396	-4.159	-5.061	-5.988	-6.885	-7.488	-7.716	-7.817	-7.878
	-7.912	-7.934	-7.939	-7.916	-7.883	-7.840	-7.774	-7.730	-7.725	-7.750
	-7.833	-7.957	-8.059	-8.166	-8.304	-8.445	-8.568	-8.679	-8.834	-9.021
	-9.366	-10.03	-10.74	-11.29	-11.71	-12.00	-12.16			
0 18	-6.030	-3.303	-4.104	-5.019	-5.951	-6.851	-7.456	-7.684	-7.786	-7.847
	-7.880	-7.903	-7.906	-7.882	-7.845	-7.790	-7.680	-7.505	-7.416	-7.524

	-7.739	-7.908	-8.022	-8.132	-8.273	-8.415	-8.539	-8.651	-8.806	-8.994
	-9.340	-10.01	-10.72	-11.28	-11.70	-11.99	-12.15			
0 19	-6.029	-3.256	-4.077	-4.997	-5.932	-6.834	-7.439	-7.668	-7.770	-7.832
	-7.865	-7.887	-7.891	-7.866	-7.828	-7.771	-7.650	-7.391	-7.062	-7.411
	-7.709	-7.890	-8.005	-8.117	-8.258	-8.401	-8.524	-8.636	-8.792	-8.980
	-9.327	-9.996	-10.71	-11.27	-11.69	-11.99	-12.14			
0 20	-6.029	-3.208	-4.049	-4.976	-5.914	-6.817	-7.423	-7.653	-7.754	-7.816
	-7.850	-7.872	-7.876	-7.852	0.1854	-7.760	-7.650	-7.474	-7.386	-7.494
	-7.709	-7.878	-7.992	-8.103	-8.244	-8.386	-8.510	-8.622	-8.778	-8.967
	-9.314	-9.984	-10.70	-11.26	-11.69	-11.98	-12.14			
0 21	1.0000E+30	-3.111	-3.994	-4.933	-5.877	-6.783	-7.391	-7.621	-7.724	-7.786
	-7.820	-7.842	-7.848	0.1741	-7.793	-7.749	-7.684	-7.640	-7.635	-7.660
	-7.743	-7.868	-7.971	-8.077	-8.217	-8.358	-8.482	-8.594	-8.751	-8.939
	-9.288	-9.961	-10.68	-11.24	-11.67	-11.97	-12.13			
0 22	1.510	-2.965	-3.911	-4.870	-5.822	-6.732	-7.343	-7.575	-7.678	-7.741
	-7.776	-7.801	-7.810	-7.797	-7.777	-7.756	-7.734	-7.735	-7.741	-7.755
	-7.794	-7.875	-7.956	-8.050	-8.181	-8.319	-8.442	-8.554	-8.710	-8.899
	-9.249	-9.926	-10.65	-11.22	-11.65	-11.96	-12.12			
0 23	1.516	-2.822	-3.828	-4.806	-5.767	-6.682	-7.295	-7.529	-7.633	-7.698
	-7.735	-7.762	-7.777	-7.774	-7.768	-7.763	-7.763	-7.775	-7.783	-7.795
	-7.823	-7.882	-7.947	-8.028	-8.149	-8.283	-8.403	-8.514	-8.670	-8.860
	-9.211	-9.892	-10.62	-11.20	-11.64	-11.94	-12.10			
0 24	1.529	-2.647	-3.724	-4.726	-5.698	-6.618	-7.236	-7.472	-7.578	-7.645
	-7.684	-7.716	-7.738	-7.749	-7.756	-7.764	-7.778	-7.794	-7.803	-7.814
	-7.838	-7.884	-7.936	-8.005	-8.113	-8.240	-8.357	-8.467	-8.622	-8.811
	-9.163	-9.849	-10.58	-11.17	-11.61	-11.92	-12.09			
0 25	1.564	-2.375	-3.557	-4.597	-5.587	-6.517	-7.141	-7.382	-7.491	-7.563
	-7.607	-7.646	-7.682	-7.709	-7.729	-7.748	-7.770	-7.789	-7.799	-7.809
	-7.831	-7.869	-7.911	-7.967	-8.060	-8.175	-8.286	-8.393	-8.545	-8.734
	-9.087	-9.781	-10.53	-11.12	-11.57	-11.89	-12.06			
0 26	1.637	-2.051	-3.349	-4.436	-5.448	-6.391	-7.024	-7.272	-7.386	-7.465
	-7.515	-7.563	-7.611	-7.651	-7.679	-7.703	-7.730	-7.749	-7.759	-7.770
	0.2089	-7.826	-7.863	-7.911	-7.993	-8.098	-8.202	-8.304	-8.453	-8.640
	-8.995	-9.697	-10.46	-11.06	-11.53	-11.86	-12.03			
0 27	1.737	-1.740	-3.141	-4.275	-5.310	-6.265	-6.908	-7.163	-7.284	-7.369
	-7.425	-7.480	-7.536	-7.585	-7.617	-7.644	-7.672	-7.692	-7.703	-7.713
	-7.734	-7.768	-7.803	-7.848	-7.923	-8.021	-8.120	-8.218	-8.363	-8.549
	-8.903	-9.613	-10.39	-11.01	-11.48	-11.82	-12.00			
0 28	1.862	-1.439	-2.933	-4.114	-5.171	-6.140	-6.793	-7.056	-7.182	-7.274
	-7.334	-7.395	-7.458	-7.511	-7.546	-7.575	-7.604	-7.625	-7.635	-7.646
	-7.667	-7.700	-7.734	-7.778	-7.850	-7.943	-8.038	-8.133	-8.275	-8.459
	-8.813	-9.531	-10.32	-10.95	-11.44	-11.79	-11.98			
0 29	2.087	-1.001	-2.622	-3.872	-4.963	-5.952	-6.621	-6.897	-7.031	-7.131
	-7.198	-7.266	-7.335	-7.393	-7.430	-7.461	-7.492	-7.513	-7.523	-7.534
	-7.556	-7.588	-7.622	-7.664	-7.734	-7.823	-7.915	-8.006	-8.144	-8.326
	-8.680	-9.409	-10.22	-10.87	-11.37	-11.74	-11.94			
0 30	2.479	-0.4474	-2.213	-3.551	-4.687	-5.702	-6.394	-6.686	-6.830	-6.938
	-7.011	-7.085	-7.160	-7.222	-7.261	-7.293	-7.325	-7.346	-7.357	-7.368
	-7.390	-7.423	-7.457	-7.499	-7.568	-7.656	-7.745	-7.835	-7.971	-8.151
	-8.506	-9.250	-10.09	-10.76	-11.29	-11.68	-11.89			
0 31	3.455	8.633	-1.401	-2.909	-4.132	-5.201	-5.941	-6.262	-6.422	1.456
	-6.625	-6.707	-6.790	-6.857	-6.900	-6.934	-6.968	-6.990	-7.002	-7.013
	-7.036	-7.071	-7.106	-7.149	-7.219	-7.308	-7.397	-7.487	-7.622	-7.802
	-8.161	-8.939	-9.832	-10.56	-11.13	-11.56	-11.80			
0 32	0.0000E+00	2.934	0.3162	-1.518	-2.903	-4.077	-4.909	-5.279	-5.464	-5.605
	-5.699	-5.794	-5.889	-5.965	-6.013	-6.052	-6.090	-6.116	-6.128	-6.141
	-6.167	-6.206	-6.244	-6.292	-6.370	-6.466	-6.564	-6.661	-6.808	-7.005
	-7.398	-8.279	-9.310	-10.15	-10.83	-11.37	-11.70			
0 33	5.298	0.0000E+00	2.023	-1.7090E-03	-1.394	-2.580	-3.471	-3.858	-4.060	-4.223
	-4.337	-4.456	-4.576	-4.673	-4.732	-4.779	-4.825	-4.855	-4.870	-4.885
	-4.915	-4.959	-5.003	-5.058	-5.145	-5.252	-5.359	-5.466	-5.629	-5.857
	-6.344	-7.515	-8.787	-9.734	-10.57	-11.33	-11.90			
0 34	3.964	3.644	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	-8.560	-9.416	-10.35	-11.48	-12.65			
0 35	2.990	2.657	1.965	0.8091	-0.2405	-1.307	-2.188	-2.582	-2.790	-2.959
	-3.077	-3.202	-3.327	-3.429	-3.491	-3.540	-3.589	-3.621	-3.637	-3.653
	-3.685	-3.732	-3.779	-3.838	-3.931	-4.047	-4.164	-4.282	-4.463	-4.719
	-5.276	-6.713	0.0000E+00	0.0000E+00	-9.917	-11.58	-14.51			
0 36	2.368	2.055	1.435	0.5447	-0.4355	-1.480	-2.323	-2.709	-2.904	-3.052
	-3.152	-3.251	-3.352	-3.433	-3.483	-3.524	-3.564	-3.591	-3.605	-3.619
	-3.646	-3.686	-3.727	-3.778	-3.860	-3.963	-4.066	-4.169	-4.325	-4.536
	-4.963	-5.975	-7.636	0.0000E+00	-8.683	-10.29	0.0000E+00			
0 37	2.068	1.771	1.195	0.3936	-0.5398	-1.554	-2.355	-2.711	-2.888	-3.020
	-3.107	-3.194	-3.280	-3.349	-3.392	-3.425	-3.459	-3.482	-3.493	-3.504
	-3.527	-3.560	-3.593	-3.634	-3.700	-3.780	-3.860	-3.937	-4.051	-4.194
	-4.461	-4.867	-4.282	0.0000E+00	-3.085	0.0000E+00	-10.44			

0

VOLUMETRIC BUDGET FOR ENTIRE MODEL AT END OF TIME STEP 20 IN STRESS PERIOD 1

0 CUMULATIVE VOLUMES L**3 — RATES FOR THIS TIME STEP L**3/T

	CUMULATIVE VOLUMES (L**3)	RATES FOR THIS TIME STEP (L**3/T)
IN:		
STORAGE =	0.00000E+00	0.00000E+00
CONSTANT HEAD =	0.15281E+07	0.88433
WELLS =	0.00000E+00	0.00000E+00
0 TOTAL IN =	0.15281E+07	0.88433
0 OUT:		
STORAGE =	0.00000E+00	0.00000E+00
CONSTANT HEAD =	0.15005E+07	0.86831
WELLS =	27648.	0.16000E-01
0 TOTAL OUT =	0.15281E+07	0.88431
0 IN - OUT =	-21.625	0.12100E-04
0 PERCENT DISCREPANCY =	0.00	0.00

0

TIME SUMMARY AT END OF TIME STEP 20 IN STRESS PERIOD 1

SECONDS MINUTES HOURS DAYS YEARS

TIME STEP LENGTH	86400.0	1440.00	24.0000	1.00000	0.273785E-02
STRESS PERIOD TIME	0.172800E+07	28800.0	480.000	20.0000	0.547570E-01
TOTAL SIMULATION TIME	0.172800E+07	28800.0	480.000	20.0000	0.547570E-01

1

NO PONPING WELL

```
1                        U.S. GEOLOGICAL SURVEY MODULAR FINITE-DIFFERENCE GROUND-WATER MODEL
0BONMOD1 1 layer, 37 rows, 37 columns, 0 abstraction well                   unconfined, impermeable bedrock
    1 LAYERS         37 ROWS         37 COLUMNS
   1 STRESS PERIOD(S) IN SIMULATION
 MODEL TIME UNIT IS SECONDS
0I/O UNITS:
 ELEMENT OF IUNIT:  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
         I/O UNIT: 11  0  0  0  0  0  0  0 19  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0BAS1 -- BASIC MODEL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT  1
 ARRAYS RHS AND BUFF WILL SHARE MEMORY.
 START HEAD WILL BE SAVED
     12399 ELEMENTS IN X ARRAY ARE USED BY BAS
     12399 ELEMENTS OF X ARRAY USED OUT OF    30000
0BCF1 -- BLOCK-CENTERED FLOW PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 11
 STEADY-STATE SIMULATION
       LAYER  AQUIFER TYPE
       -------------------
         1          1
      2739 ELEMENTS IN X ARRAY ARE USED BY BCF
     15138 ELEMENTS OF X ARRAY USED OUT OF    30000
0SIP1 -- STRONGLY IMPLICIT PROCEDURE SOLUTION PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 19
 MAXIMUM OF 100 ITERATIONS ALLOWED FOR CLOSURE
  5 ITERATION PARAMETERS
      5881 ELEMENTS IN X ARRAY ARE USED BY SIP
     21019 ELEMENTS OF X ARRAY USED OUT OF    30000
1BONMOD1 1 layer, 37 rows, 37 columns, 0 abstraction well                   unconfined, impermeable bedrock
0
```

$k = 0.015$ feet/minute
or
1.5×10^{-2} feet/minute
$b = 33' - 60'$

BOUNDARY ARRAY FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (37I2)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	31	32	33	34	35	36	37																							
0 1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	-1	-1	1	1	1	1	1																							
0 2	1	1	1	1	1	1	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	1	1	1	1	1	1	1																							
0 3	-1	-1	-1	-1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 32	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 33	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1																							
0 34	1	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	1	1	1	1	1																							
0 35	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	-1	-1	1	1	1																							
0 36	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	-1	1	1	-1																							
0 37	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

```
    1    1    1   -1    1   -1    1
0AQUIFER HEAD WILL BE SET TO  999.90     AT ALL NO-FLOW NODES (IBOUND=0).
0
```

INITIAL HEAD FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (37F5.0)

	1 16 31	2 17 32	3 18 33	4 19 34	5 20 35	6 21 36	7 22 37	8 23	9 24	10 25	11 26	12 27	13 28	14 29	15 30
0 1	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	900.0	900.0	880.0	880.0	880.0	880.0	880.0								
0 2	880.0	880.0	880.0	880.0	880.0	880.0	880.0	900.0	900.0	900.0	900.0	900.0	900.0	900.0	900.0
	900.0	900.0	900.0	900.0	900.0	900.0	900.0	900.0	900.0	900.0	900.0	900.0	900.0	900.0	900.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 3	893.0	897.0	889.0	887.0	893.0	894.0	895.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 4	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 5	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 6	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 7	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 8	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 9	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 10	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 11	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 12	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 13	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 14	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 15	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 16	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 17	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 18	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 19	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 20	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 21	800.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 22	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 23	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 24	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 25	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 26	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	888.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 27	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 28	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 29	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 30	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 31	880.0	888.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								
0 32	873.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0								

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0 33    880.0   875.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0   880.0   880.0
0 34    880.0   880.0   877.0   879.0   880.0   881.0   882.0   882.0   882.0   882.0   882.0   883.0   883.0   884.0   884.0
        884.0   884.0   884.0   884.0   884.0   884.0   884.0   884.0   884.0   884.0   884.0   884.0   884.0   884.0   884.0
        885.0   887.0   880.0   880.0   880.0   880.0   880.0
0 35    880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   889.0   889.0   880.0   880.0   880.0
0 36    880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   891.0   880.0   880.0   899.0
0 37    880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0   880.0   880.0
0DEFAULT OUTPUT CONTROL -- THE FOLLOWING OUTPUT COMES AT THE END OF EACH STRESS PERIOD:
 TOTAL VOLUMETRIC BUDGET
           HEAD
           DRAWDOWN
0                                                   COLUMN TO ROW ANISOTROPY =   1.000000
0

                                                 DELR WILL BE READ ON UNIT 11 USING FORMAT:            (37F6.3)
                                 ----------------------------------------------------------------------------------

   60.000       60.000       60.000       60.000       60.000       60.000       30.000       10.000       10.000       5.0000
   5.0000       5.0000       5.0000       3.0000       2.0000       2.0000       2.0000       0.67000      0.67000      0.67000
   2.0000       2.0000       2.0000       3.0000       5.0000       5.0000       5.0000       5.0000       10.000       10.000
   30.000       60.000       60.000       60.000       60.000       60.000       60.000
0

                                                 DELC WILL BE READ ON UNIT 11 USING FORMAT:            (37F6.3)
                                 ----------------------------------------------------------------------------------

   60.000       60.000       60.000       60.000       60.000       60.000       30.000       10.000       10.000       5.0000
   5.0000       5.0000       5.0000       3.0000       2.0000       2.0000       2.0000       0.67000      0.67000      0.67000
   2.0000       2.0000       2.0000       3.0000       5.0000       5.0000       5.0000       5.0000       10.000       10.000
   30.000       60.000       60.000       60.000       60.000       60.000       60.000
0                                                      HYD. COND. ALONG ROWS =  0.2500000E-03 FOR LAYER  1
0                                                                   BOTTOM =   840.0000     FOR LAYER  1
0


                                                       SOLUTION BY THE STRONGLY IMPLICIT PROCEDURE
                                                       -------------------------------------------
0                                              MAXIMUM ITERATIONS ALLOWED FOR CLOSURE =       100
                                                              ACCELERATION PARAMETER =     1.0000
                                                  HEAD CHANGE CRITERION FOR CLOSURE =    0.10000E-02
                                                  SIP HEAD CHANGE PRINTOUT INTERVAL =        1
0
    5 ITERATION PARAMETERS CALCULATED FROM SPECIFIED WSEED = 0.00100000 :

          0.0000000E+00  0.8221720E+00  0.9683772E+00  0.9943766E+00  0.9990000E+00
1                                                   STRESS PERIOD NO.   1, LENGTH =   1728000.
                                                    ----------------------------------------------

                                                    NUMBER OF TIME STEPS =     20

                                                     MULTIPLIER FOR DELT =     1.000

                                                  INITIAL TIME STEP SIZE =   86400.00
0**********NODE    1  21    1 (LAYER,ROW,COL) WENT DRY AT ITERATION =  1  TIME STEP =  1  STRESS PERIOD =  1
0
    26 ITERATIONS FOR TIME STEP   1 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
    19.31      (  1,  1, 30)  7.961       (  1,  1,  7)  4.373       (  1,  3, 37)  7.494       (  1,  3, 37)  5.920       (  1, 12, 24)
  -0.7008      (  1,  6,  7)  0.4671      (  1, 31,  7) -0.5077      (  1,  8, 10)  0.5681      (  1, 20, 18)  0.8425      (  1, 15, 26)
   0.8579E-01 (  1,  6,  8) -0.7246E-01 (  1,  1, 37)  0.7484E-01 (  1, 10, 17) -0.1149      (  1, 27, 16) -0.7659E-01 (  1, 18, 10)
  -0.1784E-01 (  1, 28,  7)  0.1627E-01 (  1, 26, 14)  0.2034E-01 (  1, 27, 15)  0.1987E-01 (  1, 28, 21)  0.1384E-01 (  1, 15, 17)
  -0.3508E-02 (  1, 24, 12) -0.4179E-02 (  1, 25, 11) -0.3310E-02 (  1, 21, 12) -0.4455E-02 (  1, 19, 14) -0.4126E-02 (  1, 10, 11)
  -0.8947E-03 (  1,  7, 16)
0
     1 ITERATIONS FOR TIME STEP   2 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.4079E-03 (  1, 12, 13)
0
     1 ITERATIONS FOR TIME STEP   3 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.2852E-03 (  1, 14, 16)
0
     1 ITERATIONS FOR TIME STEP   4 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.2219E-03 (  1, 14, 16)
0
     1 ITERATIONS FOR TIME STEP   5 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.1820E-03 (  1, 15, 16)
0
     1 ITERATIONS FOR TIME STEP   6 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.1543E-03 (  1, 15, 17)
0
     1 ITERATIONS FOR TIME STEP   7 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
```

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0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.1323E-03 (  1, 15, 17)
0
     1 ITERATIONS FOR TIME STEP   8 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.1147E-03 (  1, 16, 17)
0
     1 ITERATIONS FOR TIME STEP   9 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.1015E-03 (  1, 16, 17)
0
     1 ITERATIONS FOR TIME STEP  10 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.9031E-04 (  1, 16, 17)
0
     1 ITERATIONS FOR TIME STEP  11 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.8124E-04 (  1, 17, 18)
0
     1 ITERATIONS FOR TIME STEP  12 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.7389E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP  13 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.6778E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP  14 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.6224E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP  15 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.5721E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP  16 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.5265E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP  17 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.4853E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP  18 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.4478E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP  19 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.4138E-04 (  1, 18, 18)
0
     1 ITERATIONS FOR TIME STEP  20 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.3827E-04 (  1, 18, 18)
0
1                             HEAD IN LAYER  1 AT END OF TIME STEP 20 IN STRESS PERIOD  1
                     ---------------------------------------------------------------------------

              1          2          3          4          5          6          7          8          9         10
             11         12         13         14         15         16         17         18         19         20
             21         22         23         24         25         26         27         28         29         30
             31         32         33         34         35         36         37
 ..............................................................................................................
0  1      893.3      893.3      892.5      892.7      894.1      896.1      897.7      898.4      898.6      898.8
          898.9      899.0      899.1      899.2      899.2      899.2      899.3      899.3      899.3      899.3
          899.3      899.4      899.4      899.4      899.5      899.5      899.6      899.6      899.7      899.8
          900.0      900.0      898.0      896.9      896.1      895.7      895.5
0  2      893.4      893.9      891.7      891.3      893.6      895.7      898.3      900.0      900.0      900.0
          900.0      900.0      900.0      900.0      900.0      900.0      900.0      900.0      900.0      900.0
          900.0      900.0      900.0      900.0      900.0      900.0      900.0      900.0      900.0      900.0
          899.3      898.4      897.2      896.4      895.8      895.4      895.2
0  3      893.0      897.0      889.0      887.0      893.0      894.0      895.0      895.8      896.1      896.3
          896.4      896.5      896.6      896.6      896.7      896.7      896.7      896.7      896.7      896.7
          896.8      896.8      896.8      896.8      896.9      896.9      896.9      897.0      897.0      897.0
          897.0      896.7      896.1      895.6      895.2      895.0      894.9
0  4      891.8      892.3      890.0      889.4      891.3      892.6      893.5      893.8      894.0      894.1
          894.2      894.3      894.4      894.4      894.5      894.5      894.5      894.5      894.5      894.5
          894.5      894.6      894.6      894.6      894.7      894.7      894.8      894.8      894.8      894.9
          895.0      895.1      894.9      894.7      894.5      894.4      894.4
0  5      890.0      889.9      889.3      889.3      890.2      891.2      891.9      892.2      892.4      892.5
          892.5      892.6      892.6      892.7      892.7      892.8      892.8      892.8      892.8      892.8
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	892.8	892.8	892.9	892.9	892.9	893.0	893.0	893.1	893.1	893.2
	893.4	893.6	893.8	893.8	893.8	893.8	893.8			
0 6	888.3	888.1	887.9	888.2	888.9	889.8	890.4	890.7	890.9	891.0
	891.0	891.1	891.1	891.2	891.2	891.2	891.3	891.3	891.3	891.3
	891.3	891.3	891.4	891.4	891.4	891.5	891.5	891.6	891.7	891.8
	892.0	892.3	892.7	892.9	893.0	893.1	893.2			
0 7	887.1	886.5	886.6	887.1	887.8	888.7	889.4	889.7	889.8	889.9
	890.0	890.0	890.1	890.1	890.2	890.2	890.2	890.2	890.3	890.3
	890.3	890.3	890.3	890.4	890.4	890.5	890.5	890.6	890.7	890.8
	891.0	891.5	891.9	892.3	892.5	892.7	892.8			
0 8	886.7	885.7	885.9	886.5	887.3	888.2	888.9	889.2	889.3	889.4
	889.5	889.6	889.6	889.7	889.7	889.8	889.8	889.8	889.8	889.8
	889.8	889.9	889.9	889.9	890.0	890.0	890.1	890.2	890.2	890.4
	890.6	891.1	891.6	892.0	892.3	892.5	892.6			
0 9	886.5	885.3	885.5	886.2	887.1	888.0	888.7	888.9	889.1	889.2
	889.3	889.3	889.4	889.5	889.5	889.5	889.6	889.6	889.6	889.6
	889.6	889.6	889.7	889.7	889.7	889.8	889.9	889.9	890.0	890.2
	890.4	890.9	891.4	891.9	892.2	892.4	892.5			
0 10	886.3	884.9	885.3	886.0	886.9	887.8	888.5	888.8	888.9	889.0
	889.1	889.2	889.2	889.3	889.3	889.4	889.4	889.4	889.4	889.4
	889.4	889.5	889.5	889.5	889.6	889.6	889.7	889.8	889.9	890.0
	890.2	890.8	891.3	891.8	892.1	892.3	892.5			
0 11	886.3	884.7	885.1	885.8	886.7	887.7	888.4	888.7	888.8	888.9
	889.0	889.1	889.1	889.2	889.2	889.2	889.3	889.3	889.3	889.3
	889.3	889.4	889.4	889.4	889.5	889.5	889.6	889.7	889.8	889.9
	890.1	890.7	891.2	891.7	892.0	892.3	892.4			
0 12	886.2	884.4	884.9	885.7	886.6	887.5	888.2	888.5	888.7	888.8
	888.9	888.9	889.0	889.1	889.1	889.1	889.2	889.2	889.2	889.2
	889.2	889.2	889.3	889.3	889.4	889.4	889.5	889.6	889.7	889.8
	890.0	890.6	891.2	891.6	892.0	892.2	892.4			
0 13	886.1	884.1	884.7	885.5	886.4	887.4	888.1	888.4	888.6	888.7
	888.8	888.8	888.9	889.0	889.0	889.0	889.0	889.1	889.1	889.1
	889.1	889.1	889.2	889.2	889.3	889.3	889.4	889.5	889.6	889.7
	889.9	890.5	891.1	891.6	891.9	892.2	892.3			
0 14	886.1	883.9	884.5	885.4	886.3	887.3	888.0	888.3	888.5	888.6
	888.7	888.7	888.8	888.9	888.9	888.9	889.0	889.0	889.0	889.0
	889.0	889.0	889.1	889.1	889.2	889.2	889.3	889.4	889.5	889.6
	889.9	890.4	891.0	891.5	891.9	892.2	892.3			
0 15	886.1	883.7	884.4	885.3	886.3	887.2	888.0	888.3	888.4	888.5
	888.6	888.7	888.7	888.8	888.8	888.9	888.9	888.9	888.9	888.9
	889.0	889.0	889.0	889.1	889.1	889.2	889.2	889.3	889.4	889.6
	889.8	890.4	891.0	891.5	891.9	892.2	892.3			
0 16	886.1	883.6	884.3	885.2	886.2	887.2	887.9	888.2	888.4	888.5
	888.6	888.6	888.7	888.8	888.8	888.8	888.9	888.9	888.9	888.9
	888.9	888.9	889.0	889.0	889.1	889.1	889.2	889.3	889.4	889.5
	889.8	890.3	891.0	891.5	891.9	892.1	892.3			
0 17	886.1	883.5	884.2	885.2	886.2	887.1	887.9	888.2	888.3	888.4
	888.5	888.6	888.7	888.7	888.8	888.8	888.8	888.8	888.8	888.9
	888.9	888.9	888.9	889.0	889.0	889.1	889.2	889.2	889.3	889.5
	889.7	890.3	890.9	891.4	891.8	892.1	892.3			
0 18	886.1	883.4	884.2	885.1	886.1	887.1	887.8	888.1	888.3	888.4
	888.5	888.6	888.6	888.7	888.7	888.8	888.8	888.8	888.8	888.8
	888.8	888.9	888.9	888.9	889.0	889.1	889.1	889.2	889.3	889.4
	889.7	890.3	890.9	891.4	891.8	892.1	892.3			
0 19	886.1	883.3	884.2	885.1	886.1	887.1	887.8	888.1	888.3	888.4
	888.5	888.5	888.6	888.7	888.7	888.7	888.8	888.8	888.8	888.8
	888.8	888.9	888.9	888.9	889.0	889.1	889.1	889.2	889.3	889.4
	889.7	890.3	890.9	891.4	891.8	892.1	892.3			
0 20	886.1	883.3	884.1	885.1	886.1	887.1	887.8	888.1	888.3	888.4
	888.4	888.5	888.6	888.7	888.7	888.7	888.8	888.8	888.8	888.8
	888.8	888.8	888.9	888.9	889.0	889.0	889.1	889.2	889.3	889.4
	889.7	890.3	890.9	891.4	891.8	892.1	892.2			
0 21	-1.0000E+30	883.2	884.1	885.1	886.1	887.0	887.8	888.1	888.2	888.3
	888.4	888.5	888.6	888.6	888.7	888.7	888.7	888.7	888.8	888.8
	888.8	888.8	888.8	888.9	888.9	889.0	889.1	889.1	889.3	889.4
	889.7	890.2	890.9	891.4	891.8	892.1	892.2			
0 22	878.5	883.0	884.0	885.0	886.0	887.0	887.7	888.0	888.2	888.3
	888.4	888.4	888.5	888.6	888.6	888.7	888.7	888.7	888.7	888.7
	888.7	888.8	888.8	888.8	888.9	889.0	889.0	889.1	889.2	889.4
	889.6	890.2	890.8	891.4	891.8	892.1	892.2			
0 23	878.5	882.9	883.9	884.9	885.9	886.9	887.7	888.0	888.1	888.3
	888.3	888.4	888.5	888.5	888.6	888.6	888.6	888.7	888.7	888.7
	888.7	888.7	888.8	888.8	888.8	888.9	889.0	889.1	889.2	889.3
	889.6	890.2	890.8	891.3	891.8	892.1	892.2			
0 24	878.5	882.7	883.8	884.8	885.9	886.9	887.6	887.9	888.1	888.2
	888.3	888.3	888.4	888.5	888.5	888.6	888.6	888.6	888.6	888.6
	888.6	888.7	888.7	888.7	888.8	888.9	888.9	889.0	889.1	889.3
	889.5	890.1	890.8	891.3	891.7	892.0	892.2			
0 25	878.5	882.4	883.6	884.7	885.8	886.8	887.5	887.8	888.0	888.1
	888.2	888.3	888.3	888.4	888.4	888.5	888.5	888.5	888.5	888.5
	888.6	888.6	888.6	888.6	888.7	888.8	888.9	888.9	889.0	889.2
	889.5	890.0	890.7	891.3	891.7	892.0	892.2			
0 26	878.4	882.1	883.4	884.6	885.6	886.6	887.4	887.7	887.9	888.0
	888.1	888.1	888.2	888.3	888.3	888.4	888.4	888.4	898.4	888.4
	888.4	888.5	888.5	888.5	888.6	888.7	888.7	888.8	888.9	889.1
	889.4	890.0	890.6	891.2	891.7	892.0	892.1			
0 27	878.3	881.8	883.2	884.4	885.5	886.5	887.3	887.6	887.8	887.9
	888.0	888.0	888.1	888.2	888.2	888.2	888.3	888.3	888.3	888.3
	888.3	888.4	888.4	888.4	888.5	888.6	888.6	888.7	888.8	889.0
	889.3	889.9	890.6	891.2	891.6	891.9	892.1			
0 28	878.2	881.5	883.0	884.2	885.3	886.4	887.1	887.5	887.6	887.8
	887.8	887.9	888.0	888.1	888.1	888.1	888.2	888.2	888.2	888.2
	888.2	888.3	888.3	888.3	888.4	888.5	888.5	888.6	888.7	888.9
	889.2	889.8	890.5	891.1	891.6	891.9	892.1			
0 29	877.9	881.1	882.7	884.0	885.1	886.2	887.0	887.3	887.5	887.6
	887.7	887.7	887.8	887.9	887.9	888.0	888.0	888.0	888.0	888.0
	888.1	888.1	888.1	888.2	888.2	888.3	888.4	888.5	888.6	888.7
	889.0	889.7	890.4	891.0	891.5	891.8	892.0			
0 30	877.6	880.5	882.3	883.7	884.8	885.9	886.7	887.1	887.2	887.4
	887.4	887.5	887.6	887.7	887.7	887.7	887.8	887.8	887.8	887.8
	887.8	887.9	887.9	887.9	888.0	888.1	888.2	888.2	888.4	888.5
	888.8	889.5	890.3	890.9	891.4	891.8	892.0			
0 31	876.6	879.4	881.5	883.0	884.3	885.4	886.2	886.6	886.8	886.9
	887.0	887.1	887.2	887.2	887.3	887.3	887.3	887.4	887.4	887.4
	887.4	887.4	887.5	887.5	887.6	887.7	887.7	887.8	888.0	888.1
	888.5	889.2	890.0	890.7	891.2	891.7	891.9			
0 32	873.0	877.1	879.7	881.6	883.0	884.2	885.1	885.5	885.7	885.8
	885.9	886.0	886.1	886.2	886.2	886.3	886.3	886.3	886.4	886.4

constant head erroneously set at 800 instead of 880 should not affect model

```
       886.4      886.4      886.5      886.5      886.6      886.7      886.8      886.9      887.0      887.2
       887.6      888.5      889.4      890.3      890.9      891.5      891.8
 0 33  874.7      875.0      878.0      880.0      881.5      882.7      883.6      884.0      884.2      884.3
       884.4      884.6      884.7      884.8      884.8      884.9      884.9      885.0      885.0      885.0
       885.0      885.1      885.1      885.2      885.3      885.4      885.5      885.6      885.7      886.0
       886.4      887.6      888.9      889.8      890.6      891.4      892.0
 0 34  876.0      876.4      877.0      879.0      880.0      881.0      882.0      882.0      882.0      882.0
       882.0      883.0      883.0      884.0      884.0      884.0      884.0      884.0      884.0      884.0
       884.0      884.0      884.0      884.0      884.0      884.0      884.0      884.0      884.0      884.0
       885.0      887.0      888.6      889.5      890.4      891.5      892.7
 0 35  877.0      877.3      878.0      879.2      880.2      881.3      882.2      882.6      882.8      883.0
       883.1      883.2      883.3      883.4      883.5      883.5      883.6      883.6      883.6      883.7
       883.7      883.7      883.8      883.8      883.9      884.0      884.2      884.3      884.5      884.7
       885.3      886.7      889.0      889.0      889.9      891.6      894.5
 0 36  877.6      877.9      878.6      879.5      880.4      881.5      882.3      882.7      882.9      883.1
       883.2      883.3      883.4      883.4      883.5      883.5      883.6      883.6      883.6      883.6
       883.6      883.7      883.7      883.8      883.9      884.0      884.1      884.2      884.3      884.5
       885.0      886.0      887.6      891.0      888.7      890.3      899.0
 0 37  877.9      878.2      878.8      879.6      880.5      881.6      882.4      882.7      882.9      883.0
       883.1      883.2      883.3      883.3      883.4      883.4      883.5      883.5      883.5      883.5
       883.5      883.6      883.6      883.6      883.7      883.8      883.9      883.9      884.1      884.2
       884.5      884.9      884.3      880.0      883.1      880.0      890.4
1                  DRAWDOWN IN LAYER  1 AT END OF TIME STEP 20 IN STRESS PERIOD  1
           ---------------------------------------------------------------------------------

         1          2          3          4          5          6          7          8          9         10
        11         12         13         14         15         16         17         18         19         20
        21         22         23         24         25         26         27         28         29         30
        31         32         33         34         35         36         37
 ..........................................................................................................
 0  1  -13.33     -13.25     -12.55     -12.66     -14.11     -16.06     -17.73     -18.37     -18.64     -18.81
       -18.91     -19.01     -19.10     -19.17     -19.21     -19.24     -19.27     -19.29     -19.30     -19.31
       -19.33     -19.36     -19.39     -19.42     -19.47     -19.53     -19.59     -19.64     -19.72     -19.82
       0.0000E+00 0.0000E+00 -18.05     -16.85     -16.10     -15.66     -15.45
 0  2  -13.40     -13.88     -11.71     -11.30     -13.56     -15.72     -18.28     0.0000E+00 0.0000E+00 0.0000E+00
       0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
       0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
       -19.32     -18.40     -17.25     -16.38     -15.79     -15.42     -15.25
 0  3  0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00 -15.76     -16.07     -16.26
       -16.37     -16.47     -16.56     -16.62     -16.66     -16.68     -16.71     -16.73     -16.74     -16.75
       -16.76     -16.78     -16.81     -16.83     -16.87     -16.91     -16.94     -16.96     -16.99     -17.00
       -16.95     -16.67     -16.12     -15.62     -15.24     -14.99     -14.87
 0  4  -11.77     -12.26     -10.01     -9.434     -11.33     -12.58     -13.46     -13.84     -14.02     -14.14
       -14.22     -14.29     -14.36     -14.42     -14.45     -14.48     -14.50     -14.52     -14.53     -14.53
       -14.55     -14.57     -14.59     -14.62     -14.66     -14.71     -14.75     -14.79     -14.85     -14.91
       -15.00     -15.06     -14.92     -14.73     -14.55     -14.42     -14.36
 0  5  -10.01     -9.929     -9.300     -9.293     -10.20     -11.20     -11.92     -12.21     -12.35     -12.46
       -12.52     -12.59     -12.65     -12.70     -12.73     -12.75     -12.77     -12.79     -12.80     -12.81
       -12.82     -12.84     -12.86     -12.89     -12.93     -12.99     -13.03     -13.08     -13.15     -13.23
       -13.38     -13.62     -13.76     -13.80     -13.80     -13.78     -13.78
 0  6  -8.271     -8.055     -7.937     -8.219     -8.931     -9.796     -10.45     -10.72     -10.85     -10.95
       -11.02     -11.08     -11.14     -11.19     -11.22     -11.25     -11.27     -11.29     -11.29     -11.30
       -11.32     -11.34     -11.36     -11.39     -11.44     -11.49     -11.55     -11.60     -11.68     -11.78
       -11.97     -12.33     -12.66     -12.89     -13.04     -13.14     -13.18
 0  7  -7.095     -6.533     -6.586     -7.069     -7.836     -8.713     -9.372     -9.654     -9.792     -9.894
       -9.961     -10.03     -10.09     -10.15     -10.18     -10.20     -10.23     -10.25     -10.25     -10.26
       -10.28     -10.31     -10.33     -10.36     -10.41     -10.47     -10.53     -10.59     -10.68     -10.79
       -11.01     -11.45     -11.91     -12.26     -12.51     -12.68     -12.77
 0  8  -6.656     -5.736     -5.899     -6.499     -7.320     -8.221     -8.894     -9.183     -9.325     -9.430
       -9.499     -9.568     -9.636     -9.690     -9.723     -9.750     -9.777     -9.794     -9.803     -9.812
       -9.830     -9.856     -9.882     -9.915     -9.966     -10.03     -10.09     -10.16     -10.25     -10.37
       -10.60     -11.08     -11.59     -11.99     -12.29     -12.49     -12.60
 0  9  -6.459     -5.300     -5.538     -6.204     -7.056     -7.973     -8.654     -8.947     -9.091     -9.198
       -9.268     -9.338     -9.407     -9.462     -9.496     -9.524     -9.551     -9.569     -9.578     -9.587
       -9.605     -9.632     -9.658     -9.692     -9.744     -9.810     -9.874     -9.938     -10.03     -10.16
       -10.40     -10.89     -11.43     -11.86     -12.18     -12.40     -12.52
 0 10  -6.336     -4.940     -5.257     -5.977     -6.856     -7.785     -8.474     -8.770     -8.916     -9.024
       -9.096     -9.167     -9.237     -9.293     -9.327     -9.355     -9.383     -9.401     -9.410     -9.419
       -9.437     -9.465     -9.492     -9.526     -9.579     -9.646     -9.712     -9.777     -9.874     -10.00
       -10.25     -10.75     -11.32     -11.76     -12.10     -12.34     -12.46
 0 11  -6.262     -4.687     -5.065     -5.824     -6.721     -7.660     -8.354     -8.652     -8.800     -8.909
       -8.981     -9.052     -9.123     -9.180     -9.215     -9.243     -9.270     -9.289     -9.298     -9.308
       -9.326     -9.354     -9.381     -9.415     -9.470     -9.537     -9.604     -9.670     -9.768     -9.896
       -10.14     -10.66     -11.24     -11.70     -12.05     -12.29     -12.42
 0 12  -6.200     -4.418     -4.870     -5.670     -6.586     -7.534     -8.233     -8.535     -8.683     -8.793
       -8.866     -8.938     -9.010     -9.067     -9.102     -9.130     -9.159     -9.177     -9.187     -9.196
       -9.215     -9.243     -9.270     -9.305     -9.360     -9.428     -9.496     -9.563     -9.662     -9.792
       -10.05     -10.57     -11.16     -11.64     -12.00     -12.25     -12.38
 0 13  -6.149     -4.132     -4.671     -5.514     -6.450     -7.408     -8.113     -8.417     -8.567     -8.678
       -8.751     -8.824     -8.897     -8.954     -8.990     -9.019     -9.047     -9.066     -9.075     -9.085
       -9.104     -9.132     -9.160     -9.195     -9.251     -9.320     -9.389     -9.456     -9.557     -9.689
       -9.946     -10.48     -11.09     -11.57     -11.95     -12.21     -12.34
 0 14  -6.120     -3.887     -4.510     -5.368     -6.340     -7.307     -8.017     -8.323     -8.474     -8.586
       -8.660     -8.733     -8.806     -8.864     -8.900     -8.929     -8.958     -8.977     -8.987     -8.996
       -9.015     -9.044     -9.072     -9.108     -9.164     -9.234     -9.303     -9.372     -9.473     -9.607
       -9.867     -10.41     -11.03     -11.52     -11.91     -12.17     -12.31
 0 15  -6.106     -3.727     -4.409     -5.309     -6.272     -7.244     -7.956     -8.264     -8.416     -8.528
       -8.602     -8.676     -8.750     -8.808     -8.844     -8.873     -8.902     -8.922     -8.931     -8.941
       -8.960     -8.989     -9.017     -9.053     -9.109     -9.180     -9.249     -9.318     -9.421     -9.555
       -9.818     -10.37     -10.99     -11.49     -11.88     -12.15     -12.30
 0 16  -6.097     -3.595     -4.327     -5.246     -6.217     -7.193     -7.908     -8.217     -8.369     -8.482
       -8.557     -8.631     -8.705     -8.763     -8.800     -8.829     -8.858     -8.877     -8.887     -8.896
       -8.916     -8.945     -8.973     -9.009     -9.066     -9.137     -9.207     -9.276     -9.379     -9.514
       -9.778     -10.33     -10.96     -11.47     -11.86     -12.14     -12.28
 0 17  -6.092     -3.459     -4.245     -5.182     -6.162     -7.143     -7.860     -8.170     -8.323     -8.436
       -8.511     -8.586     -8.660     -8.718     -8.755     -8.784     -8.813     -8.833     -8.843     -8.852
       -8.872     -8.901     -8.929     -8.965     -9.023     -9.094     -9.164     -9.234     -9.338     -9.473
       -9.739     -10.30     -10.93     -11.44     -11.84     -12.12     -12.27
 0 18  -6.090     -3.366     -4.190     -5.140     -6.125     -7.109     -7.828     -8.139     -8.292     -8.405
       -8.481     -8.555     -8.630     -8.688     -8.725     -8.755     -8.784     -8.803     -8.813     -8.823
       -8.842     -8.871     -8.900     -8.936     -8.994     -9.065     -9.136     -9.206     -9.310     -9.446
       -9.713     -10.27     -10.91     -11.43     -11.83     -12.11     -12.26
 0 19  -6.089     -3.318     -4.162     -5.118     -6.107     -7.092     -7.812     -8.123     -8.276     -8.390
       -8.465     -8.540     -8.614     -8.674     -8.710     -8.740     -8.769     -8.788     -8.798     -8.808
       -8.827     -8.857     -8.885     -8.922     -8.979     -9.051     -9.121     -9.192     -9.296     -9.432
       -9.700     -10.26     -10.90     -11.42     -11.82     -12.10     -12.25
 0 20  -6.089     -3.270     -4.134     -5.097     -6.088     -7.075     -7.796     -8.107     -8.261     -8.374
       -8.450     -8.525     -8.599     -8.659     -0.6953    -8.725     -8.754     -8.774     -8.783     -8.793
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	-8.813	-8.842	-8.871	-8.907	-8.965	-9.036	-9.107	-9.177	-9.282	-9.419
	-9.686	-10.25	-10.89	-11.41	-11.81	-12.10	-12.25			
0 21	1.0000E+30	-3.174	-4.079	-5.054	-6.051	-7.041	-7.763	-8.076	-8.229	-8.344
	-8.419	-8.495	-8.569	-0.6286	-8.666	-8.695	-8.724	-8.744	-8.754	-8.764
	-8.783	-8.812	-8.842	-8.878	-8.936	-9.008	-9.079	-9.149	-9.254	-9.391
	-9.660	-10.23	-10.87	-11.40	-11.80	-12.09	-12.24			
0 22	1.472	-3.027	-3.996	-4.990	-5.996	-6.990	-7.715	-8.029	-8.183	-8.298
	-8.374	-8.449	-8.524	-8.584	-8.621	-8.651	-8.680	-8.700	-8.710	-8.720
	-8.739	-8.769	-8.798	-8.834	-8.892	-8.965	-9.036	-9.107	-9.212	-9.351
	-9.621	-10.19	-10.84	-11.37	-11.78	-12.07	-12.23			
0 23	1.477	-2.884	-3.913	-4.926	-5.940	-6.939	-7.667	-7.981	-8.137	-8.252
	-8.328	-8.404	-8.479	-8.539	-8.576	-8.606	-8.636	-8.656	-8.666	-8.675
	-8.695	-8.725	-8.754	-8.791	-8.849	-8.922	-8.994	-9.065	-9.171	-9.310
	-9.582	-10.16	-10.81	-11.35	-11.76	-12.06	-12.21			
0 24	1.490	-2.709	-3.809	-4.846	-5.871	-6.876	-7.607	-7.923	-8.078	-8.194
	-8.271	-8.347	-8.423	-8.483	-8.521	-8.551	-8.581	-8.600	-8.610	-8.620
	-8.640	-8.670	-8.700	-8.736	-8.795	-8.868	-8.940	-9.012	-9.119	-9.259
	-9.533	-10.11	-10.78	-11.32	-11.74	-12.04	-12.20			
0 25	1.526	-2.436	-3.642	-4.717	-5.760	-6.774	-7.510	-7.828	-7.986	-8.102
	-8.180	-8.257	-8.333	-8.394	-8.432	-8.462	-8.492	-8.512	-8.522	-8.532
	-8.552	-8.582	-8.612	-8.649	-8.709	-8.782	-8.856	-8.928	-9.036	-9.178
	-9.456	-10.04	-10.72	-11.27	-11.70	-12.01	-12.17			
0 26	1.599	-2.111	-3.432	-4.556	-5.621	-6.646	-7.389	-7.711	-7.869	-7.987
	-8.066	-8.143	-8.221	-8.282	-8.321	-8.351	-8.382	-8.402	-8.412	-8.422
	-0.4427	-8.473	-8.503	-8.541	-8.601	-8.676	-8.750	-8.823	-8.933	-9.077
	-9.359	-9.958	-10.65	-11.21	-11.65	-11.97	-12.14			
0 27	1.700	-1.798	-3.223	-4.394	-5.481	-6.518	-7.268	-7.593	-7.753	-7.872
	-7.952	-8.030	-8.108	-8.171	-8.209	-8.240	-8.271	-8.292	-8.302	-8.313
	-8.333	-8.364	-8.394	-8.433	-8.493	-8.569	-8.644	-8.719	-8.830	-8.976
	-9.263	-9.873	-10.58	-11.15	-11.61	-11.93	-12.11			
0 28	1.826	-1.497	-3.015	-4.232	-5.341	-6.390	-7.147	-7.475	-7.637	-7.758
	-7.837	-7.917	-7.996	-8.059	-8.098	-8.130	-8.161	-8.182	-8.192	-8.203
	-8.224	-8.255	-8.286	-8.324	-8.386	-8.463	-8.539	-8.614	-8.727	-8.875
	-9.166	-9.788	-10.51	-11.10	-11.56	-11.90	-12.08			
0 29	2.052	-1.056	-2.703	-3.988	-5.130	-6.198	-6.965	-7.298	-7.462	-7.585
	-7.666	-7.747	-7.828	-7.892	-7.932	-7.964	-7.995	-8.017	-8.027	-8.038
	-8.059	-8.091	-8.122	-8.162	-8.225	-8.303	-8.380	-8.458	-8.573	-8.724
	-9.023	-9.661	-10.40	-11.01	-11.50	-11.85	-12.04			
0 30	2.447	-0.5002	-2.292	-3.664	-4.850	-5.940	-6.722	-7.062	-7.230	-7.355
	-7.438	-7.520	-7.603	-7.669	-7.710	-7.742	-7.775	-7.797	-7.808	-7.818
	-7.840	-7.873	-7.905	-7.945	-8.010	-8.090	-8.170	-8.250	-8.368	-8.524
	-8.832	-9.494	-10.27	-10.90	-11.41	-11.78	-11.99			
0 31	3.429	8.586	-1.474	-3.015	-4.285	-5.422	-6.232	-6.585	-6.760	1.109
	-6.978	-7.064	-7.151	-7.220	-7.263	-7.297	-7.331	-7.354	-7.366	-7.377
	-7.400	-7.434	-7.468	-7.511	-7.579	-7.664	-7.748	-7.832	-7.958	-8.124
	-8.452	-9.164	-10.00	-10.69	-11.25	-11.67	-11.90			
0 32	0.0000E+00	2.905	0.2601	-1.604	-3.024	-4.244	-5.114	-5.497	-5.688	-5.832
	-5.928	-6.024	-6.121	-6.198	-6.246	-6.284	-6.323	-6.348	-6.361	-6.374
	-6.400	-6.438	-6.476	-6.524	-6.601	-6.697	-6.792	-6.888	-7.031	-7.222
	-7.604	-8.451	-9.448	-10.26	-10.93	-11.46	-11.79			
0 33	5.298	0.0000E+00	1.996	-4.6936E-02	-1.459	-2.666	-3.572	-3.964	-4.168	-4.332
	-4.447	-4.567	-4.687	-4.784	-4.843	-4.889	-4.935	-4.966	-4.981	-4.996
	-5.026	-5.070	-5.114	-5.169	-5.255	-5.362	-5.468	-5.575	-5.737	-5.963
	-6.446	-7.606	-8.871	-9.811	-10.64	-11.40	-11.96			
0 34	3.964	3.644	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	-8.590	-9.454	-10.40	-11.53	-12.69			
0 35	2.990	2.657	1.965	0.8091	-0.2405	-1.307	-2.188	-2.582	-2.790	-2.959
	-3.077	-3.202	-3.327	-3.429	-3.491	-3.540	-3.589	-3.621	-3.637	-3.653
	-3.685	-3.732	-3.779	-3.838	-3.931	-4.047	-4.164	-4.282	-4.463	-4.719
	-5.276	-6.713	0.0000E+00	0.0000E+00	-9.936	-11.60	-14.53			
0 36	2.368	2.055	1.435	0.5447	-0.4355	-1.480	-2.323	-2.709	-2.904	-3.052
	-3.152	-3.251	-3.352	-3.433	-3.483	-3.524	-3.564	-3.591	-3.605	-3.619
	-3.646	-3.686	-3.727	-3.778	-3.860	-3.963	-4.066	-4.169	-4.325	-4.536
	-4.963	-5.975	-7.636	0.0000E+00	-8.691	-10.30	0.0000E+00			
0 37	2.068	1.771	1.195	0.3936	-0.5398	-1.554	-2.355	-2.711	-2.888	-3.020
	-3.107	-3.194	-3.280	-3.349	-3.392	-3.425	-3.459	-3.482	-3.493	-3.504
	-3.527	-3.560	-3.593	-3.634	-3.700	-3.780	-3.860	-3.937	-4.051	-4.194
	-4.461	-4.867	-4.282	0.0000E+00	-3.087	0.0000E+00	-10.44			

0

VOLUMETRIC BUDGET FOR ENTIRE MODEL AT END OF TIME STEP 20 IN STRESS PERIOD 1

	CUMULATIVE VOLUMES	L**3	RATES FOR THIS TIME STEP	L**3/T
0	IN:		IN:	
	STORAGE =	0.00000E+00	STORAGE =	0.00000E+00
	CONSTANT HEAD =	0.15183E+07	CONSTANT HEAD =	0.87864
0	TOTAL IN =	0.15183E+07	TOTAL IN =	0.87864
0	OUT:		OUT:	
	STORAGE =	0.00000E+00	STORAGE =	0.00000E+00
	CONSTANT HEAD =	0.15183E+07	CONSTANT HEAD =	0.87863
0	TOTAL OUT =	0.15183E+07	TOTAL OUT =	0.87863
0	IN - OUT =	-15.875	IN - OUT =	0.65565E-05
0	PERCENT DISCREPANCY =	0.00	PERCENT DISCREPANCY =	0.00

0

TIME SUMMARY AT END OF TIME STEP 20 IN STRESS PERIOD 1

	SECONDS	MINUTES	HOURS	DAYS	YEARS
TIME STEP LENGTH	86400.0	1440.00	24.0000	1.00000	0.273785E-02
STRESS PERIOD TIME	0.172800E+07	28800.0	480.000	20.0000	0.547570E-01
TOTAL SIMULATION TIME	0.172800E+07	28800.0	480.000	20.0000	0.547570E-01

1

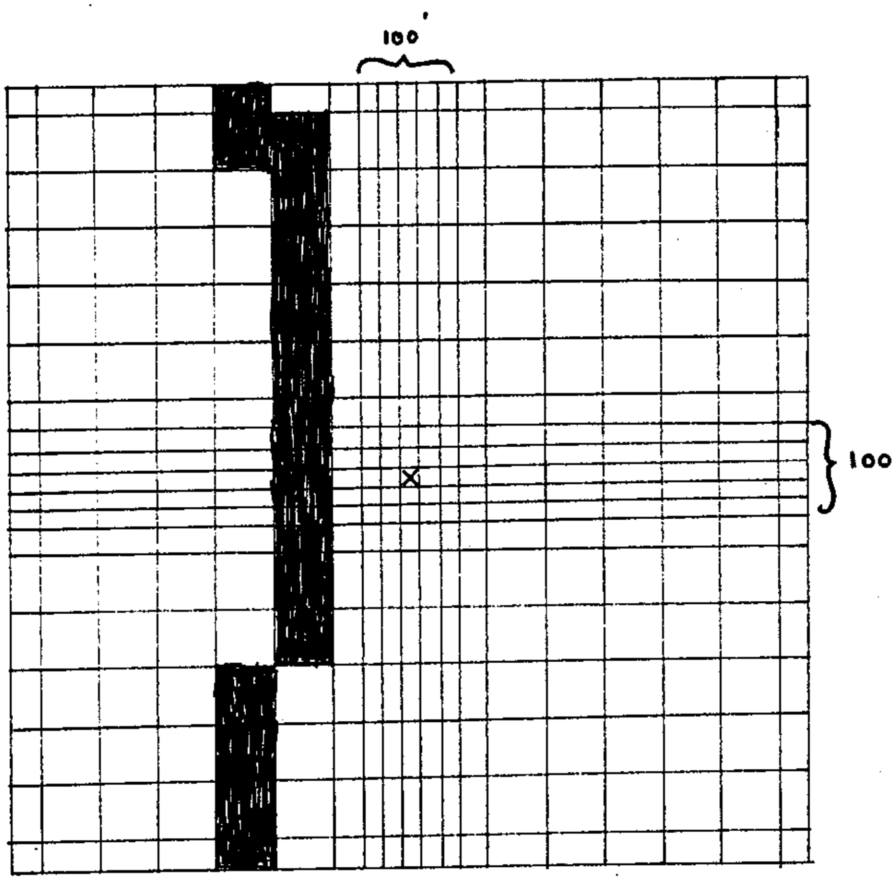
MODFLOW Simulation and Actual Head Comparisons including Simulated Discharge Drawdowns
West Washington Branch off-site well. (proposed CAP well RW-7)
K=2x10e-3 ft/min Q=4gpm
b= 39 to 46 feet

CELL NUMBER (i,j)	ACTUAL HEAD	SIMULATED STEADY-STATE HEAD	HEAD DIFFERENCE	SIMULATED PUMPING HEAD	SIMULATED DRAWDOWN	RADIAL DISTANCE	CONSTANT HEAD CELL
1,1	881	862.9	-18.1	862.9	0	560	NO
1,35	886	860.7	-25.3	859.9	-0.8	560	NO
5,5	863.5	860.2	-3.3	860.2	0	240	NO
5,31	872.8	860.4	-12.4	859.5	-0.9	240	NO
8,8	858	859.4	1.4	858.1	-1.3	65	NO
8,28	864.5	859.6	-4.9	857.9	-1.7	65	NO
10,10	858	859.4	1.4	857.9	-1.5	38	NO
10,26	862	859.6	-2.4	857.3	-2.3	38	NO
14,14	858	859.4	1.4	855.9	-3.5	12	NO
14,22	859.8	859.5	-0.3	855.8	-3.7	12	NO
18,18	859	859.5	0.5	851.3	-8.2	0	NO
22,14	858.6	859.4	0.8	855.9	-3.5	12	NO
22,22	859.8	859.5	-0.3	855.8	-3.7	12	NO
26,10	856	859.3	3.3	857.3	-2	38	NO
26,26	863.5	859.5	-4	857.1	-2.4	38	NO
28,8	859	859.2	0.2	857.9	-1.3	65	NO
28,28	864.5	859.5	-5	857.6	-1.9	65	NO
31,5	852	859.1	7.1	859.1	0	240	NO
31,31	868	859.5	-8.5	858.5	-1	240	NO
35,1	865	859	-6	859	0	560	NO
35,35	875	859.5	-15.5	858.7	-0.8	560	NO

NOTES:
1. Cell Number - row then column for (i,j) notation.
2. Actual Head - interpolated from 8/21/91 water table map at block centered (i,j) location.
3. Simulated Steady-State Head - MODFLOW Simulated Head without discharge stress from pumping well.
4. Head Difference - Actual Head minus MODFLOW Simulated Steady-State Head.
5. Simulated Pumping Head - MODFLOW Simulated Head with discharge stress from pumping well located at (i,j)=(19,19).
6. Simulated Drawdown - MODFLOW Simulated Pumping Head minus MODFLOW Simulated Steady-State Head.
7. Radial Distance - (i,j) block centered distance from discharge (i,j) cell.
8. Constant Head Cell - cell that corresponds to known hydrogeologic constant head boundaries such as a stream or creek.

NOTE: FINE DISCRETISATION OF GRID IN THE CENTRAL 100 FEET ZONE NOT DRAWN FOR CLARITY. THIS ZONE WAS DISCRETISED FROM 10 FEET TO 2 FEET

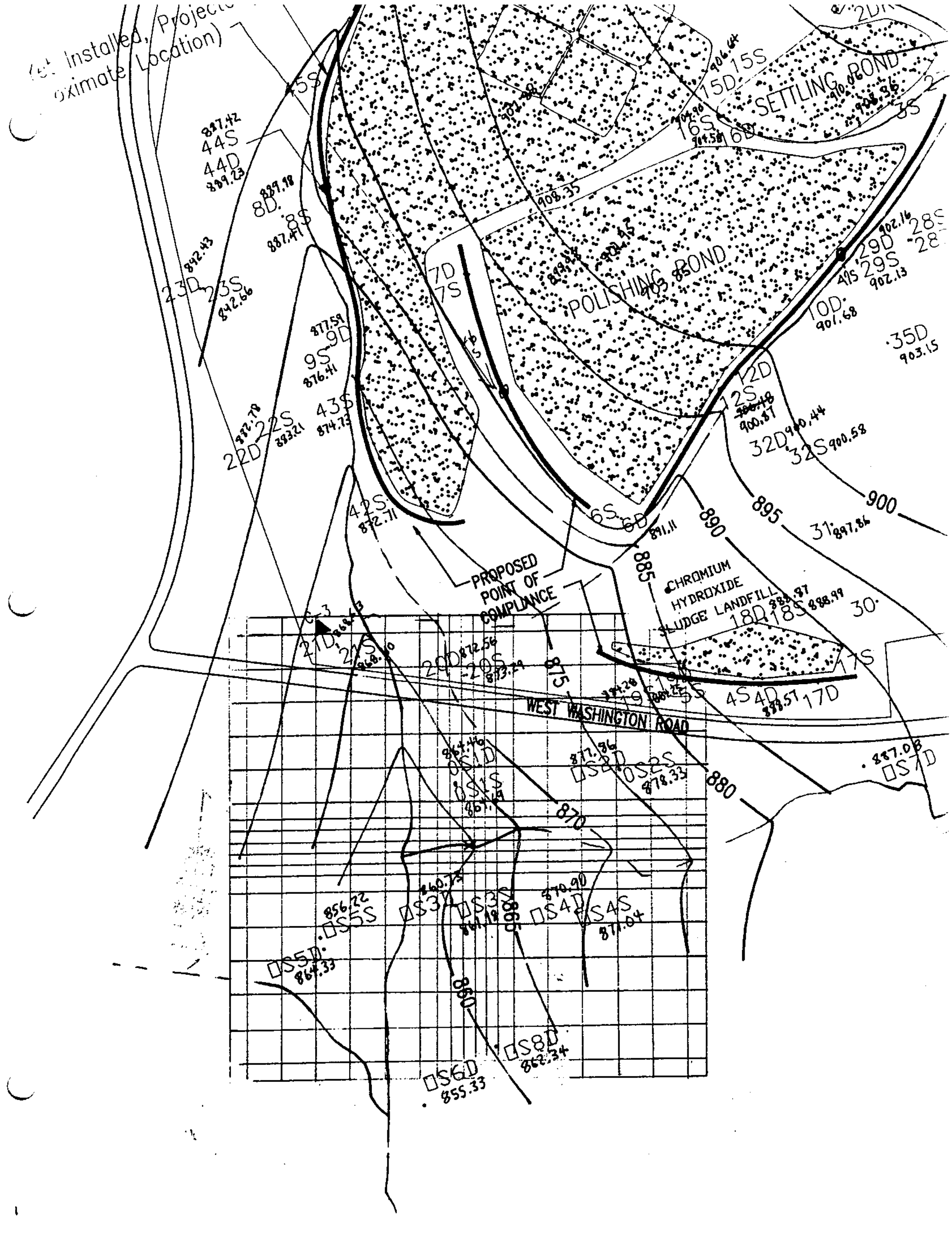
WWB-SIM



▣ - PUMPING WELL

■ - CONSTANT HEAD BOUNDARIES

□ - VARIABLE HEAD



Installed, Projecte
oximate Location)
SETTLING POND
POLISHING POND
PROPOSED POINT OF COMPLIANCE
CHROMIUM HYDROXIDE SLUDGE LANDFILL
WEST WASHINGTON ROAD
900
895
890
885
880
875
870
860
44S
44D
8D
8S
23D
23S
9D
9S
43S
22S
22D
42S
7D
7S
15D
15S
16S
12D
12S
10D
29D
29S
35D
32D
32S
31
30
6S
6D
18D
18S
17S
17D
4S
4D
21D
21S
20D
20S
S1D
S1S
S2D
S2S
S3D
S3S
S4D
S4S
S5S
S5D
S6D
S7D
S8D

WWB
With PUMPING WELL

$K = 3.6 \times 10^{-5}$ feet/second
$\approx 2 \times 10^{-3}$ feet/minute.

```
1                    U.S. GEOLOGICAL SURVEY MODULAR FINITE-DIFFERENCE GROUND-WATER MODEL
0BONMOD2 1 layer, 35 rows, 35 columns, 1 well                       unconfined, impermeable bedrock
    1 LAYERS          35 ROWS          35 COLUMNS
   1 STRESS PERIOD(S) IN SIMULATION
 MODEL TIME UNIT IS SECONDS
0I/O UNITS:
 ELEMENT OF IUNIT:  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
        I/O UNIT: 11 12  0  0  0  0  0 19  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0BAS1 -- BASIC MODEL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT  1
 ARRAYS RHS AND BUFF WILL SHARE MEMORY.
 START HEAD WILL BE SAVED
    11099 ELEMENTS IN X ARRAY ARE USED BY BAS
    11099 ELEMENTS OF X ARRAY USED OUT OF   30000
0BCF1 -- BLOCK-CENTERED FLOW PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 11
 STEADY-STATE SIMULATION
      LAYER  AQUIFER TYPE
      -------------------
        1          1
     2451 ELEMENTS IN X ARRAY ARE USED BY BCF
    13550 ELEMENTS OF X ARRAY USED OUT OF   30000
0WEL1 -- WELL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM 12
 MAXIMUM OF     1 WELLS
        4 ELEMENTS IN X ARRAY ARE USED FOR WELLS
    13554 ELEMENTS OF X ARRAY USED OUT OF   30000
0SIP1 -- STRONGLY IMPLICIT PROCEDURE SOLUTION PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 19
 MAXIMUM OF 100 ITERATIONS ALLOWED FOR CLOSURE
  5 ITERATION PARAMETERS
     5305 ELEMENTS IN X ARRAY ARE USED BY SIP
    18859 ELEMENTS OF X ARRAY USED OUT OF   30000
1BONMOD2 1 layer, 35 rows, 35 columns, 0 abstraction well                unconfined, impermeable bedrock
0
```

BOUNDARY ARRAY FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35I2)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
0 1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 2	1	1	1	1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 3	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 4	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 5	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 6	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 7	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 8	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 9	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 10	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 11	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 12	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 13	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 14	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 15	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 16	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 17	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 18	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 19	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 20	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 21	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 22	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 23	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 24	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 25	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 26	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 27	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 28	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 29	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 30	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 31	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 32	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 33	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 34	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 35	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					

```
       1    1    1    1    1
0AQUIFER HEAD WILL BE SET TO  999.90      AT ALL NO-FLOW NODES (IBOUND=0).
0
```

INITIAL HEAD FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35F5.0)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0 1	880.0	880.0	880.0	880.0	866.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 2	880.0	880.0	880.0	880.0	865.0	864.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 3	880.0	880.0	880.0	880.0	880.0	863.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 4	880.0	880.0	880.0	880.0	880.0	860.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 5	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 6	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 7	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 8	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 9	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 10	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 11	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 12	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 13	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 14	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 15	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 16	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 17	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 18	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0
0 19	800.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0	880.0
0 20	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 21	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 22	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 23	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 24	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 25	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 26	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 27	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 28	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 29	880.0	888.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	888.0	880.0	880.0	880.0	880.0	880.0
0 30	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 31	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 32	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0

	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
0 1	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 2	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 3	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 4	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 5	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 6	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 7	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 8	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 9	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 10	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 11	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 12	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 13	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 14	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 15	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 16	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 17	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 18	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 19	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 20	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 21	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 22	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 23	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 24	880.0	880.0	880.0	880.0	880.0	888.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 25	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 26	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 27	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 28	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 29	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 30	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 31	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
0 32	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0

	31	32	33	34	35
0 1	880.0	880.0	880.0	880.0	880.0
0 2	880.0	880.0	880.0	880.0	880.0
0 3	880.0	880.0	880.0	880.0	880.0
0 4	880.0	880.0	880.0	880.0	880.0
0 5	880.0	880.0	880.0	880.0	880.0
0 6	880.0	880.0	880.0	880.0	880.0
0 7	880.0	880.0	880.0	880.0	880.0
0 8	880.0	880.0	880.0	880.0	880.0
0 9	880.0	880.0	880.0	880.0	880.0
0 10	880.0	880.0	880.0	880.0	880.0
0 11	880.0	880.0	880.0	880.0	880.0
0 12	880.0	880.0	880.0	880.0	880.0
0 13	880.0	880.0	880.0	880.0	880.0
0 14	880.0	880.0	880.0	880.0	880.0
0 15	880.0	880.0	880.0	880.0	880.0
0 16	880.0	880.0	880.0	880.0	880.0
0 17	880.0	880.0	880.0	880.0	880.0
0 18	880.0	880.0	880.0	880.0	880.0
0 19	880.0	880.0	880.0	880.0	880.0
0 20	880.0	880.0	880.0	880.0	880.0
0 21	880.0	880.0	880.0	880.0	880.0
0 22	880.0	880.0	880.0	880.0	880.0
0 23	880.0	880.0	880.0	880.0	880.0
0 24	880.0	880.0	880.0	880.0	880.0
0 25	880.0	880.0	880.0	880.0	880.0
0 26	880.0	880.0	880.0	880.0	880.0
0 27	880.0	880.0	880.0	880.0	880.0
0 28	880.0	880.0	880.0	880.0	880.0
0 29	880.0	880.0	880.0	880.0	880.0
0 30	880.0	880.0	880.0	880.0	880.0
0 31	880.0	880.0	880.0	880.0	880.0
0 32	880.0	880.0	880.0	880.0	880.0

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0 33    880.0   880.0   880.0   880.0   859.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0
0 34    880.0   880.0   880.0   880.0   859.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0
0 35    880.0   880.0   880.0   880.0   858.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0
0DEFAULT OUTPUT CONTROL -- THE FOLLOWING OUTPUT COMES AT THE END OF EACH STRESS PERIOD:
 TOTAL VOLUMETRIC BUDGET
          HEAD
          DRAWDOWN
0                                            COLUMN TO ROW ANISOTROPY =   1.000000
0

                                           DELR WILL BE READ ON UNIT 11 USING FORMAT:          (35F4.0)
                              ------------------------------------------------------------------------

   60.000       60.000       60.000       60.000       60.000       60.000       30.000       10.000       10.000       5.0000
   5.0000       5.0000       5.0000       3.0000       2.0000       2.0000       2.0000       2.0000       2.0000       2.0000
   2.0000       3.0000       5.0000       5.0000       5.0000       5.0000       10.000       10.000       30.000       60.000
   60.000       60.000       60.000       60.000       60.000
0

                                           DELC WILL BE READ ON UNIT 11 USING FORMAT:          (35F4.0)
                              ------------------------------------------------------------------------

   60.000       60.000       60.000       60.000       60.000       60.000       30.000       10.000       10.000       5.0000
   5.0000       5.0000       5.0000       3.0000       2.0000       2.0000       2.0000       2.0000       2.0000       2.0000
   2.0000       3.0000       5.0000       5.0000       5.0000       5.0000       10.000       10.000       30.000       60.000
   60.000       60.000       60.000       60.000       60.000
0                                                 HYD. COND. ALONG ROWS =  0.3600000E-04 FOR LAYER  1
0                                                               BOTTOM =   820.0000     FOR LAYER  1
0


                                                      SOLUTION BY THE STRONGLY IMPLICIT PROCEDURE
                                                      -------------------------------------------
0                                           MAXIMUM ITERATIONS ALLOWED FOR CLOSURE =      100
                                                          ACCELERATION PARAMETER =     1.0000
                                                HEAD CHANGE CRITERION FOR CLOSURE =    0.10000E-02
                                                SIP HEAD CHANGE PRINTOUT INTERVAL =         1
0
   5 ITERATION PARAMETERS CALCULATED FROM SPECIFIED WSEED = 0.00100000 :

         0.0000000E+00  0.8221720E+00  0.9683772E+00  0.9943766E+00  0.9990000E+00
1                                               STRESS PERIOD NO.   1, LENGTH =   1728000.
                                                ----------------------------------------------

                                                NUMBER OF TIME STEPS =     20

                                                 MULTIPLIER FOR DELT =    1.000

                                              INITIAL TIME STEP SIZE =   86400.00
0            1 WELLS
                                              LAYER    ROW    COL    STRESS RATE   WELL NO.
                                              ---------------------------------------------
                                                1       18     18    -0.10000E-01      1
0**********NODE   1  19   1 (LAYER,ROW,COL) WENT DRY AT ITERATION =  1  TIME STEP =  1  STRESS PERIOD =  1
0
   26 ITERATIONS FOR TIME STEP   1 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -13.56      (  1, 31,  5)  -7.753      (  1, 35,  1)  -9.454      (  1,  3,  1)  -11.39      (  1, 18,  1)  -14.18      (  1, 18, 18)
   1.300      (  1, 18,  1) -0.6669      (  1,  8, 28)  -1.045      (  1,  9, 27)  -1.633      (  1, 15, 27)  -2.062      (  1, 24, 17)
 -0.1605      (  1, 18, 18) -0.9364E-01 (  1, 28, 26) -0.1310      (  1, 15, 10) -0.1508      (  1, 18, 10) -0.2144      (  1, 20, 21)
 -0.1694E-01 (  1, 18, 18)  0.1634E-01 (  1, 10, 11) -0.2047E-01 (  1, 25, 14) -0.1883E-01 (  1, 28, 21) -0.2437E-01 (  1, 24, 26)
  0.2756E-02 (  1, 28, 16) -0.2885E-02 (  1, 19, 20) -0.3838E-02 (  1, 18, 19) -0.5064E-02 (  1, 18, 18) -0.3579E-02 (  1, 26, 22)
 -0.3914E-03 (  1,  9, 30)
0
    1 ITERATIONS FOR TIME STEP   2 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 -----------------------------------------------------------------------------------------------------------------------------------
  0.1748E-03 (  1, 23, 12)
0
    1 ITERATIONS FOR TIME STEP   3 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  0.1083E-03 (  1, 23, 13)
0
    1 ITERATIONS FOR TIME STEP   4 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  0.7442E-04 (  1, 23, 13)
0
    1 ITERATIONS FOR TIME STEP   5 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  0.5350E-04 (  1, 22, 14)
0
    1 ITERATIONS FOR TIME STEP   6 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  0.4006E-04 (  1, 22, 14)
0
    1 ITERATIONS FOR TIME STEP   7 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.3274E-04 (  1, 26, 26)
0
     1 ITERATIONS FOR TIME STEP   8 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.2814E-04 (  1,  6, 32)
0
     1 ITERATIONS FOR TIME STEP   9 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.2664E-04 (  1,  3, 35)
0
     1 ITERATIONS FOR TIME STEP  10 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.2559E-04 (  1,  2, 35)
0
     1 ITERATIONS FOR TIME STEP  11 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.2453E-04 (  1,  1, 35)
0
     1 ITERATIONS FOR TIME STEP  12 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.2321E-04 (  1,  1, 35)
0
     1 ITERATIONS FOR TIME STEP  13 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.2198E-04 (  1,  1, 35)
0
     1 ITERATIONS FOR TIME STEP  14 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.2076E-04 (  1,  1, 35)
0
     1 ITERATIONS FOR TIME STEP  15 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.1946E-04 (  1,  1, 35)
0
     1 ITERATIONS FOR TIME STEP  16 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.1831E-04 (  1,  1, 35)
0
     1 ITERATIONS FOR TIME STEP  17 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.1723E-04 (  1,  1, 35)
0
     1 ITERATIONS FOR TIME STEP  18 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.1615E-04 (  1,  1, 35)
0
     1 ITERATIONS FOR TIME STEP  19 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.1523E-04 (  1,  1, 35)
0
     1 ITERATIONS FOR TIME STEP  20 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.1432E-04 (  1,  1, 35)
0
1                    HEAD IN LAYER  1 AT END OF TIME STEP 20 IN STRESS PERIOD  1
          -------------------------------------------------------------------------------

             1          2          3          4          5          6          7          8          9         10
            11         12         13         14         15         16         17         18         19         20
            21         22         23         24         25         26         27         28         29         30
            31         32         33         34         35
 ..........................................................................................................................
0  1     862.9      863.2      863.7      864.5      866.0      864.4      863.4      863.0      862.8      862.6
         862.6      862.5      862.4      862.3      862.3      862.3      862.2      862.2      862.2      862.1
         862.1      862.1      862.0      861.9      861.9      861.8      861.7      861.6      861.4      860.9
         860.5      860.2      860.1      859.9      859.9
0  2     862.7      862.9      863.3      863.9      863.0      864.0      863.0      862.6      862.4      862.3
         862.2      862.1      862.1      862.0      862.0      861.9      861.9      861.9      861.9      861.8
         861.8      861.8      861.7      861.7      861.6      861.5      861.4      861.3      861.1      860.8
         860.4      860.2      860.0      859.9      859.8
0  3     862.3      862.4      862.6      862.8      863.0      863.0      862.1      861.8      861.6      861.5
         861.5      861.4      861.4      861.3      861.3      861.3      861.3      861.2      861.2      861.2
         861.2      861.1      861.1      861.1      861.0      861.0      860.9      860.8      860.7      860.4
         860.2      860.0      859.8      859.8      859.7
0  4     861.8      861.8      861.8      861.7      861.2      860.0      860.4      860.4      860.4      860.4
         860.4      860.4      860.3      860.3      860.3      860.3      860.3      860.3      860.3      860.3
         860.3      860.3      860.3      860.3      860.2      860.2      860.2      860.2      860.1      860.0
         859.8      859.7      859.7      859.6      859.6
0  5     861.3      861.3      861.1      860.8      860.2      859.0      859.4      859.4      859.5      859.5
         859.5      859.5      859.5      859.5      859.5      859.5      859.5      859.5      859.5      859.5
         859.5      859.5      859.5      859.5      859.5      859.5      859.5      859.5      859.5      859.5
         859.5      859.5      859.4      859.4      859.4
```

0 6	860.9	860.8	860.6	860.3	859.7	859.0	858.9	858.8	858.8	858.8
	858.8	858.8	858.8	858.8	858.8	858.8	858.8	858.8	858.8	858.8
	858.8	858.8	858.8	858.8	858.8	858.8	858.8	858.8	858.8	859.0
	859.1	859.2	859.2	859.3	859.3					
0 7	860.6	860.5	860.3	860.0	859.5	859.0	858.5	858.3	858.2	858.2
	858.1	858.1	858.1	858.1	858.0	858.0	858.0	858.0	858.0	858.0
	858.0	858.0	858.0	858.0	858.1	858.1	858.1	858.2	858.3	858.6
	858.9	859.0	859.1	859.1	859.2					
0 8	860.6	860.3	860.1	859.9	859.5	859.0	858.4	858.1	857.9	857.8
	857.7	857.7	857.6	857.6	857.6	857.6	857.5	[illegible]	857.5	857.5
	857.5	857.5	857.6	857.6	857.6	857.7	857.8	857.9	858.1	858.5
	858.8	858.9	859.0	859.1	859.1					
0 9	860.5	860.3	860.1	859.8	859.5	859.0	858.3	857.9	857.7	857.6
	857.5	857.4	857.3	857.3	857.3	857.2	857.2	857.2	857.2	857.2
	857.2	857.2	857.3	857.3	857.4	857.5	857.6	857.7	858.0	858.4
	858.7	858.9	859.0	859.1	859.1					
0 10	860.5	860.2	860.0	859.8	859.4	859.0	858.2	857.8	857.6	857.4
	857.3	857.2	857.1	857.0	857.0	856.9	856.9	856.9	856.9	856.9
	856.9	857.0	857.0	857.1	857.2	857.3	857.4	857.6	857.9	858.4
	858.7	858.9	859.0	859.0	859.1					
0 11	860.5	860.2	860.0	859.8	859.4	859.0	858.2	857.8	857.5	857.3
	857.1	857.0	856.9	856.8	856.7	856.7	856.7	856.7	856.7	856.7
	856.7	856.7	856.8	856.9	857.0	857.1	857.3	857.5	857.9	858.3
	858.7	858.9	859.0	859.0	859.0					
0 12	860.5	860.2	860.0	859.7	859.4	859.0	858.2	857.7	857.4	857.2
	857.0	856.8	856.6	856.5	856.4	856.4	856.4	856.4	856.4	856.4
	856.4	856.5	856.6	856.7	856.9	857.0	857.2	857.5	857.8	858.3
	858.7	858.8	859.0	859.0	859.0					
0 13	860.5	860.1	860.0	859.7	859.4	859.0	858.2	857.7	857.4	857.1
	856.9	856.6	856.4	856.2	856.1	856.0	856.0	855.9	855.9	856.0
	856.0	856.1	856.3	856.5	856.7	856.9	857.2	857.4	857.8	858.3
	858.6	858.8	858.9	859.0	859.0					
0 14	860.5	860.1	859.9	859.7	859.4	859.0	858.2	857.6	857.3	857.0
	856.8	856.5	856.2	855.9	855.7	855.6	855.5	855.4	855.5	855.5
	855.7	855.[illegible]	856.1	856.4	856.7	856.9	857.1	857.4	857.8	858.3
	858.6	858.8	858.9	859.0	859.0					
0 15	860.5	860.1	859.9	859.7	859.4	859.0	858.1	857.6	857.3	857.0
	856.7	856.5	856.1	855.7	855.4	855.2	855.1	855.0	855.0	855.2
	855.4	855.7	856.0	856.3	856.6	856.8	857.1	857.4	857.8	858.3
	858.6	858.8	858.9	859.0	859.0					
0 16	860.5	860.1	859.9	859.7	859.4	859.0	858.1	857.6	857.3	857.0
	856.7	856.4	856.0	855.6	855.2	854.9	854.6	854.4	854.6	854.9
	855.2	855.5	855.9	856.3	856.6	856.8	857.1	857.3	857.7	858.3
	858.6	858.8	858.9	859.0	859.0					
0 17	860.5	860.0	859.9	859.7	859.4	859.0	858.1	857.6	857.3	857.0
	856.7	856.4	856.0	855.5	855.1	854.6	854.1	853.5	854.0	854.6
	855.0	855.4	855.9	856.3	856.6	856.8	857.1	857.3	857.7	858.3
	858.6	858.8	858.9	859.0	859.0					
0 18	860.5	860.0	859.9	859.7	859.4	859.0	858.1	857.6	857.3	856.9
	856.7	856.4	855.9	855.4	855.0	854.4	853.5	851.3	853.5	854.4
	854.9	855.4	855.9	856.3	856.6	856.8	857.1	857.3	857.7	858.3
	858.6	858.8	858.9	859.0	859.0					
0 19	1.0000E+30	860.0	859.9	859.7	859.4	859.0	858.1	857.6	857.3	856.9
	856.7	856.4	856.0	855.5	855.0	854.6	854.1	853.5	854.0	854.6
	855.0	855.4	855.9	856.3	856.6	856.8	857.1	857.3	857.7	858.3
	858.6	858.8	858.9	859.0	859.0					
0 20	859.7	860.0	859.9	859.6	859.4	859.0	858.1	857.6	857.3	857.0
	856.7	856.4	856.0	855.6	855.2	854.9	854.6	854.4	854.6	854.9
	855.2	855.5	855.9	856.3	856.6	856.8	857.1	857.3	857.7	858.2
	858.6	858.8	858.9	859.0	859.0					
0 21	859.7	860.0	859.9	859.6	859.3	859.0	858.1	857.6	857.3	857.0
	856.7	856.4	856.1	855.7	855.4	855.2	855.0	854.9	855.0	855.2
	855.4	855.6	856.0	856.3	856.6	856.8	857.1	857.3	857.7	858.2
	858.6	858.8	858.9	859.0	859.0					
0 22	859.7	860.0	859.8	859.6	859.3	859.0	858.1	857.6	857.3	857.0
	856.8	856.5	856.2	855.9	855.7	855.5	855.4	855.4	855.4	855.5
	855.6	855.8	856.1	856.4	856.6	856.8	857.1	857.3	857.7	858.2
	858.6	858.8	858.9	859.0	859.0					
0 23	859.7	859.9	859.8	859.6	859.3	859.0	858.1	857.6	857.3	857.0
	856.8	856.6	856.3	856.1	856.0	855.9	855.9	855.9	855.9	855.9
	856.0	856.1	856.3	856.5	856.7	856.9	857.1	857.3	857.7	858.2
	858.6	858.8	858.9	858.9	859.0					
0 24	859.7	859.9	859.8	859.6	859.3	859.0	858.1	857.7	857.4	857.1
	856.9	856.8	856.6	856.4	856.4	856.3	856.3	856.3	856.3	856.3
	856.3	856.4	856.5	856.6	856.8	856.9	857.1	857.4	857.7	858.2
	858.6	858.8	858.9	858.9	859.0					
0 25	859.7	859.9	859.8	859.6	859.3	859.0	858.2	857.7	857.4	857.2
	857.1	856.9	856.8	856.7	856.6	856.6	856.6	856.6	856.6	856.6
	856.6	856.6	856.7	856.8	856.9	857.0	857.2	857.4	857.7	858.2
	858.6	858.7	858.9	858.9	859.0					
0 26	859.7	859.8	859.7	859.6	859.3	859.0	858.2	857.7	857.5	857.3
	857.2	857.1	856.9	856.9	856.8	856.8	856.8	856.8	856.8	856.8
	856.8	856.8	856.9	856.9	857.0	857.1	857.3	857.4	857.8	858.2
	858.5	858.7	858.9	858.9	858.9					
0 27	859.7	859.8	859.7	859.5	859.3	859.0	858.2	857.8	857.6	857.5
	857.4	857.3	857.2	857.1	857.1	857.1	857.1	857.1	857.1	857.1
	857.1	857.1	857.1	857.1	857.2	857.3	857.4	857.5	857.8	858.2
	858.5	858.7	858.8	858.9	858.9					
0 28	859.7	859.7	859.7	859.5	859.3	859.0	858.3	857.9	857.8	857.6
	857.6	857.5	857.4	857.4	857.4	857.4	857.3	857.3	857.3	857.3
	857.3	857.3	857.3	857.4	857.4	857.4	857.5	857.6	857.8	858.2
	858.5	858.7	858.8	858.9	858.9					
0 29	859.6	859.7	859.6	859.4	859.2	859.0	858.4	858.1	858.0	857.9
	857.9	857.8	857.8	857.8	857.8	857.8	857.7	857.7	857.7	857.7
	857.7	857.7	857.7	857.7	857.7	857.8	857.8	857.8	858.0	858.2
	858.5	858.7	858.8	858.8	858.9					
0 30	859.5	859.5	859.4	859.3	859.2	859.0	858.6	858.5	858.4	858.4
	858.3	858.3	858.3	858.3	858.3	858.2	858.2	858.2	858.2	858.2
	858.2	858.2	858.2	858.2	858.2	858.2	858.2	858.2	858.2	858.3
	858.5	858.6	858.7	858.8	858.8					
0 31	859.3	859.3	859.3	859.2	859.1	859.0	858.7	858.7	858.6	858.6
	858.6	858.6	858.5	858.5	858.5	858.5	858.5	858.5	858.5	858.5
	858.5	858.5	858.5	858.5	858.5	858.5	858.5	858.4	858.4	858.5
	858.5	858.6	858.7	858.7	858.8					
0 32	859.2	859.2	859.1	859.1	859.0	858.9	858.8	858.7	858.7	858.7
	858.7	858.6	858.6	858.6	858.6	858.6	858.6	858.6	858.6	858.6
	858.6	858.6	858.6	858.6	858.6	858.6	858.6	858.6	858.6	858.5
	858.6	858.6	858.7	858.7	858.7					

0 33	859.1	859.1	859.0	859.0	859.0	858.8	858.7	858.7	858.7	858.7
	858.7	858.7	858.7	858.7	858.7	858.6	858.6	858.6	858.6	858.6
	858.6	858.6	858.6	858.6	858.6	858.6	858.6	858.6	858.6	858.6
	858.6	858.6	858.7	858.7	858.7					
0 34	859.0	859.0	858.9	858.9	859.0	858.7	858.7	858.7	858.6	858.6
	858.6	858.6	858.6	858.6	858.6	858.6	858.6	858.6	858.6	858.6
	858.6	858.6	858.6	858.6	858.6	858.6	858.6	858.6	858.6	858.6
	858.6	858.6	858.6	858.7	858.7					
0 35	859.0	858.9	858.8	858.6	858.0	858.4	858.5	858.6	858.6	858.6
	858.6	858.6	858.6	858.6	858.6	858.6	858.6	858.6	858.6	858.6
	858.6	858.6	858.6	858.6	858.6	858.6	858.6	858.6	858.6	858.6
	858.6	858.6	858.6	858.7	858.7					

1 DRAWDOWN IN LAYER 1 AT END OF TIME STEP 20 IN STRESS PERIOD 1

	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
	21	22	23	24	25	26	27	28	29	30
	31	32	33	34	35					
0 1	17.07	16.84	16.35	15.47	0.0000E+00	15.65	16.65	17.04	17.22	17.36
	17.44	17.53	17.61	17.67	17.71	17.74	17.77	17.80	17.83	17.86
	17.89	17.93	17.99	18.06	18.12	18.19	18.29	18.41	18.64	19.07
	19.47	19.75	19.94	20.05	20.11					
0 2	17.29	17.12	16.74	16.09	0.0000E+00	0.0000E+00	17.03	17.40	17.58	17.71
	17.79	17.87	17.94	18.00	18.04	18.06	18.09	18.12	18.15	18.17
	18.20	18.23	18.29	18.35	18.41	18.47	18.55	18.66	18.86	19.25
	19.60	19.85	20.01	20.12	20.16					
0 3	17.69	17.60	17.43	17.20	16.97	0.0000E+00	17.94	18.24	18.37	18.47
	18.53	18.58	18.64	18.68	18.71	18.73	18.75	18.77	18.79	18.81
	18.83	18.85	18.89	18.93	18.98	19.02	19.08	19.16	19.30	19.58
	19.84	20.03	20.15	20.23	20.27					
0 4	18.18	18.18	18.20	18.33	18.75	0.0000E+00	19.65	19.62	19.62	19.63
	19.64	19.65	19.66	19.67	19.67	19.68	19.68	19.69	19.69	19.70
	19.70	19.71	19.72	19.74	19.75	19.77	19.79	19.83	19.89	20.03
	20.17	20.27	20.34	20.38	20.40					
0 5	18.67	18.74	18.88	19.18	19.79	0.0000E+00	20.64	20.57	20.54	20.53
	20.52	20.52	20.51	20.51	20.51	20.51	20.51	20.51	20.50	20.50
	20.50	20.50	20.50	20.50	20.50	20.50	20.51	20.51	20.51	20.52
	20.53	20.54	20.55	20.56	20.57					
0 6	19.11	19.22	19.42	19.74	20.26	0.0000E+00	21.11	21.16	21.19	21.20
	21.21	21.22	21.23	21.23	21.23	21.23	21.24	21.24	21.24	21.24
	21.24	21.24	21.24	21.23	21.23	21.22	21.21	21.20	21.15	21.03
	20.90	20.82	20.77	20.74	20.73					
0 7	19.36	19.53	19.73	20.03	20.45	0.0000E+00	21.47	21.67	21.76	21.83
	21.87	21.90	21.93	21.94	21.95	21.96	21.96	21.97	21.97	21.97
	21.97	21.97	21.97	21.96	21.94	21.92	21.88	21.82	21.68	21.39
	21.14	21.00	20.91	20.87	20.85					
0 8	19.44	19.65	19.86	20.13	20.52	0.0000E+00	21.63	21.94	22.10	22.21
	22.28	22.34	22.39	22.42	22.44	22.45	22.46	22.46	22.46	22.46
	22.46	22.46	22.44	22.41	22.37	22.32	22.25	22.13	21.91	21.53
	21.23	21.07	20.97	20.92	20.90					
0 9	19.48	19.72	19.92	20.18	20.55	0.0000E+00	21.71	22.08	22.27	22.42
	22.51	22.60	22.67	22.72	22.74	22.76	22.77	22.77	22.78	22.77
	22.77	22.76	22.73	22.68	22.62	22.55	22.44	22.29	22.02	21.59
	21.28	21.10	21.00	20.95	20.92					
0 10	19.50	19.77	19.96	20.22	20.57	0.0000E+00	21.76	22.18	22.41	22.59
	22.71	22.83	22.94	23.01	23.04	23.06	23.08	23.08	23.09	23.08
	23.07	23.05	23.00	22.92	22.83	22.73	22.59	22.41	22.10	21.63
	21.31	21.12	21.02	20.96	20.94					
0 11	19.51	19.80	19.99	20.24	20.58	0.0000E+00	21.79	22.24	22.49	22.71
	22.85	23.00	23.14	23.23	23.28	23.30	23.32	23.33	23.33	23.33
	23.31	23.27	23.20	23.09	22.97	22.85	22.68	22.48	22.14	21.65
	21.32	21.14	21.03	20.98	20.95					
0 12	19.52	19.84	20.02	20.26	20.60	0.0000E+00	21.81	22.29	22.57	22.82
	22.99	23.18	23.36	23.49	23.56	23.61	23.64	23.65	23.65	23.63
	23.60	23.54	23.43	23.27	23.12	22.97	22.77	22.54	22.18	21.68
	21.34	21.15	21.05	20.99	20.96					
0 13	19.53	19.87	20.05	20.29	20.61	0.0000E+00	21.84	22.34	22.64	22.92
	23.13	23.36	23.61	23.81	23.92	24.00	24.05	24.07	24.06	24.02
	23.96	23.86	23.68	23.46	23.25	23.07	22.84	22.60	22.21	21.70
	21.36	21.17	21.06	21.00	20.97					
0 14	19.54	19.90	20.07	20.30	20.62	0.0000E+00	21.85	22.37	22.68	22.98
	23.21	23.48	23.81	24.10	24.29	24.43	24.53	24.57	24.54	24.45
	24.33	24.16	23.88	23.59	23.34	23.14	22.89	22.63	22.24	21.71
	21.37	21.18	21.07	21.01	20.98					
0 15	19.54	19.92	20.08	20.31	20.63	0.0000E+00	21.86	22.38	22.70	23.01
	23.26	23.55	23.92	24.29	24.55	24.77	24.95	25.04	24.96	24.79
	24.59	24.34	23.99	23.65	23.39	23.18	22.91	22.65	22.25	21.72
	21.38	21.19	21.08	21.01	20.99					
0 16	19.54	19.94	20.09	20.32	20.63	0.0000E+00	21.86	22.39	22.72	23.03
	23.28	23.59	23.99	24.42	24.76	25.07	25.38	25.57	25.39	25.10
	24.80	24.48	24.06	23.70	23.42	23.20	22.93	22.66	22.26	21.73
	21.38	21.19	21.08	21.02	20.99					
0 17	19.54	19.95	20.10	20.33	20.64	0.0000E+00	21.86	22.40	22.73	23.05
	23.30	23.62	24.04	24.52	24.94	25.38	25.94	26.51	25.95	25.40
	24.98	24.58	24.11	23.73	23.44	23.21	22.94	22.67	22.26	21.73
	21.39	21.20	21.09	21.02	21.00					
0 18	19.54	19.97	20.11	20.34	20.64	0.0000E+00	21.87	22.40	22.73	23.05
	23.31	23.63	24.06	24.57	33.03	25.57	26.50	28.66	26.52	25.60
	25.07	24.62	24.14	23.74	23.45	23.22	22.94	22.68	22.27	21.74
	21.39	21.20	21.09	21.03	21.00					
0 19	1.0000E+30	19.98	20.13	20.35	20.64	0.0000E+00	21.87	22.40	22.73	23.05
	23.31	23.63	24.05	32.53	24.95	25.39	25.95	26.52	25.96	25.41
	24.99	24.59	24.12	23.74	23.45	23.22	22.95	22.68	22.27	21.75
	21.40	21.21	21.09	21.03	21.00					
0 20	20.29	20.00	20.14	20.35	20.65	0.0000E+00	21.87	22.40	22.73	23.05
	23.30	23.61	24.01	24.44	24.78	25.09	25.40	25.59	25.41	25.12
	24.82	24.50	24.08	23.72	23.44	23.22	22.95	22.68	22.28	21.75
	21.40	21.21	21.10	21.04	21.01					
0 21	20.29	20.02	20.15	20.36	20.65	0.0000E+00	21.87	22.40	22.72	23.04
	23.28	23.57	23.94	24.32	24.58	24.79	24.98	25.06	24.99	24.82
	24.62	24.37	24.02	23.68	23.42	23.21	22.94	22.68	22.28	21.76
	21.41	21.22	21.10	21.04	21.01					
0 22	20.29	20.03	20.16	20.37	20.66	0.0000E+00	21.87	22.39	22.71	23.01
	23.25	23.52	23.84	24.14	24.33	24.47	24.57	24.61	24.58	24.49
	24.37	24.20	23.92	23.63	23.39	23.19	22.93	22.68	22.28	21.76
	21.42	21.22	21.11	21.05	21.02					

0 23	20.30	20.06	20.18	20.39	20.67	0.0000E+00	21.86	22.38	22.68	22.96
	23.17	23.41	23.66	23.86	23.98	24.05	24.11	24.13	24.12	24.08
	24.02	23.92	23.74	23.52	23.32	23.14	22.91	22.66	22.28	21.77
	21.42	21.23	21.12	21.05	21.03					
0 24	20.30	20.10	20.20	20.41	20.68	0.0000E+00	21.85	22.35	22.63	22.88
	23.06	23.25	23.43	23.57	23.64	23.68	23.71	23.73	23.73	23.71
	31.68	23.62	23.52	23.36	23.20	23.06	22.86	22.64	22.27	21.77
	21.43	21.24	21.13	21.06	21.04					
0 25	20.31	20.13	20.23	20.42	20.69	0.0000E+00	21.83	22.31	22.57	22.79
	22.94	23.09	23.23	23.33	23.37	23.40	23.42	23.44	23.44	23.43
	23.41	23.38	23.31	23.20	23.08	22.97	22.80	22.60	22.26	21.78
	21.44	21.25	21.14	21.07	21.05					
0 26	20.31	20.16	20.25	20.44	20.70	0.0000E+00	21.81	22.26	22.50	22.69
	22.82	22.94	23.05	23.12	23.16	23.18	23.20	23.21	23.21	23.21
	23.20	23.18	23.13	23.05	22.96	22.87	22.73	22.55	22.25	21.78
	21.45	21.26	21.15	21.08	21.06					
0 27	20.33	20.20	20.29	20.47	20.71	0.0000E+00	21.78	22.18	22.39	22.55
	22.65	22.74	22.82	22.87	22.89	22.91	22.92	22.93	22.94	22.94
	22.93	22.92	22.90	22.85	22.79	22.73	22.62	22.48	22.21	21.78
	21.46	21.27	21.16	21.10	21.07					
0 28	20.34	20.25	20.33	20.50	20.73	0.0000E+00	21.73	22.08	22.25	22.37
	22.45	22.52	22.58	22.61	22.63	22.65	22.66	22.66	22.67	22.67
	22.67	22.67	22.66	22.63	22.60	22.55	22.48	22.37	22.16	21.78
	21.47	21.29	21.18	21.12	21.09					
0 29	20.39	28.34	20.41	20.56	20.77	0.0000E+00	21.61	21.87	21.99	30.07
	22.12	22.16	22.20	22.22	22.24	22.25	22.26	22.26	22.27	22.27
	22.28	22.28	22.28	22.28	22.26	22.25	22.22	22.16	22.04	21.75
	21.49	21.32	21.21	21.15	21.12					
0 30	20.51	20.51	20.57	20.68	20.83	0.0000E+00	21.39	21.54	21.60	21.65
	21.67	21.70	21.72	21.74	21.75	21.75	21.76	21.77	21.77	21.78
	21.78	21.79	21.79	21.80	21.81	21.81	21.81	21.80	21.77	21.65
	21.49	21.36	21.27	21.21	21.19					
0 31	20.66	20.68	20.73	20.81	20.91	0.0000E+00	21.25	21.34	21.38	21.41
	21.43	21.44	21.46	21.47	21.48	21.48	21.49	21.49	21.50	21.50
	21.50	21.51	21.52	21.53	21.53	21.54	21.55	21.55	21.56	21.53
	21.45	21.38	21.31	21.27	21.25					
0 32	20.79	20.81	20.85	20.92	0.0000E+00	21.11	21.24	21.29	21.32	21.33
	21.34	21.35	21.36	21.37	21.37	21.38	21.38	21.38	21.39	21.39
	21.39	21.40	21.40	21.41	21.42	21.42	21.43	21.44	21.45	21.45
	21.42	21.38	21.33	21.30	21.29					
0 33	20.90	20.92	20.96	21.00	0.0000E+00	21.17	21.26	21.30	21.31	21.32
	21.33	21.34	21.34	21.35	21.35	21.35	21.35	21.36	21.36	21.36
	21.36	21.36	21.37	21.37	21.38	21.38	21.39	21.39	21.40	21.41
	21.40	21.37	21.35	21.33	21.31					
0 34	20.98	21.01	21.08	21.13	0.0000E+00	21.27	21.33	21.35	21.35	21.36
	21.36	21.36	21.37	21.37	21.37	21.37	21.37	21.37	21.37	21.37
	21.37	21.37	21.38	21.38	21.38	21.38	21.38	21.39	21.39	21.39
	21.38	21.37	21.35	21.34	21.33					
0 35	21.03	21.08	21.20	21.44	0.0000E+00	21.56	21.46	21.44	21.43	21.42
	21.42	21.41	21.41	21.41	21.41	21.41	21.41	21.41	21.40	21.40
	21.40	21.40	21.40	21.40	21.40	21.40	21.40	21.40	21.39	21.39
	21.38	21.37	21.35	21.34	21.34					

0

VOLUMETRIC BUDGET FOR ENTIRE MODEL AT END OF TIME STEP 20 IN STRESS PERIOD 1

	CUMULATIVE VOLUMES	L**3	RATES FOR THIS TIME STEP	L**3/T
0	IN:		IN:	
	STORAGE =	0.00000E+00	STORAGE =	0.00000E+00
	CONSTANT HEAD =	34483.	CONSTANT HEAD =	0.19956E-01
	WELLS =	0.00000E+00	WELLS =	0.00000E+00
0	TOTAL IN =	34483.	TOTAL IN =	0.19956E-01
0	OUT:		OUT:	
	STORAGE =	0.00000E+00	STORAGE =	0.00000E+00
	CONSTANT HEAD =	17204.	CONSTANT HEAD =	0.99561E-02
	WELLS =	17280.	WELLS =	0.10000E-01
0	TOTAL OUT =	34484.	TOTAL OUT =	0.19956E-01
0	IN - OUT =	-1.7695	IN - OUT =	-0.53085E-06
0	PERCENT DISCREPANCY =	-0.01	PERCENT DISCREPANCY =	0.00

0

TIME SUMMARY AT END OF TIME STEP 20 IN STRESS PERIOD 1

	SECONDS	MINUTES	HOURS	DAYS	YEARS
TIME STEP LENGTH	86400.0	1440.00	24.0000	1.00000	0.273785E-02
STRESS PERIOD TIME	0.172800E+07	28800.0	480.000	20.0000	0.547570E-01
TOTAL SIMULATION TIME	0.172800E+07	28800.0	480.000	20.0000	0.547570E-01

1

WWB
NO PUMPING WELL

```
1                   U.S. GEOLOGICAL SURVEY MODULAR FINITE-DIFFERENCE GROUND-WATER MODEL
0BONMOD2 1 layer, 35 rows, 35 columns, 0 abstraction well                    unconfined, impermeable bedrock
   1 LAYERS          35 ROWS          35 COLUMNS
   1 STRESS PERIOD(S) IN SIMULATION
 MODEL TIME UNIT IS SECONDS
0I/O UNITS:
 ELEMENT OF IUNIT:  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
        I/O UNIT: 11  0  0  0  0  0  0  0 19  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0BAS1 -- BASIC MODEL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT  1
 ARRAYS RHS AND BUFF WILL SHARE MEMORY.
 START HEAD WILL BE SAVED
     11099 ELEMENTS IN X ARRAY ARE USED BY BAS
     11099 ELEMENTS OF X ARRAY USED OUT OF    30000
0BCF1 -- BLOCK-CENTERED FLOW PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 11
 STEADY-STATE SIMULATION
      LAYER  AQUIFER TYPE
      -------------------
        1         1
      2451 ELEMENTS IN X ARRAY ARE USED BY BCF
     13550 ELEMENTS OF X ARRAY USED OUT OF    30000
0SIP1 -- STRONGLY IMPLICIT PROCEDURE SOLUTION PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 19
 MAXIMUM OF 100 ITERATIONS ALLOWED FOR CLOSURE
  5 ITERATION PARAMETERS
      5305 ELEMENTS IN X ARRAY ARE USED BY SIP
     18855 ELEMENTS OF X ARRAY USED OUT OF    30000
1BONMOD2 1 layer, 35 rows, 35 columns, 0 abstraction well                    unconfined, impermeable bedrock
0
```

BOUNDARY ARRAY FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35I2)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
0 1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 2	1	1	1	1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 3	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 4	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 5	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 6	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 7	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 8	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 9	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 10	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 11	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 12	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 13	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 14	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 15	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 16	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 17	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 18	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 19	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 20	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 21	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 22	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 23	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 24	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 25	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 26	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 27	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 28	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 29	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 30	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 31	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 32	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 33	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 34	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0 35	1	1	1	1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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0AQUIFER HEAD WILL BE SET TO  999.90      AT ALL NO-FLOW NODES (IBOUND=0).
0
```

INITIAL HEAD FOR LAYER 1 WILL BE READ ON UNIT 1 USING FORMAT: (35F5.0)

	1 16 31	2 17 32	3 18 33	4 19 34	5 20 35	6 21	7 22	8 23	9 24	10 25	11 26	12 27	13 28	14 29	15 30
0 1	880.0	880.0	880.0	880.0	866.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 2	880.0	880.0	880.0	880.0	865.0	864.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 3	880.0	880.0	880.0	880.0	880.0	863.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 4	880.0	880.0	880.0	880.0	880.0	860.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 5	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 6	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 7	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 8	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 9	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 10	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 11	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 12	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 13	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 14	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 15	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 16	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 17	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 18	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 19	800.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	888.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 20	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 21	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 22	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 23	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 24	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	888.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 25	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 26	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 27	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 28	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 29	880.0	888.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	888.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 30	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 31	880.0	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 32	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 33	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0
	880.0	880.0	880.0	880.0	880.0										
0 34	880.0	880.0	880.0	880.0	859.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0	880.0

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        880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0
0 35    880.0   880.0   880.0   880.0   858.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0   880.0
        880.0   880.0   880.0   880.0   880.0
0DEFAULT OUTPUT CONTROL -- THE FOLLOWING OUTPUT COMES AT THE END OF EACH STRESS PERIOD:
 TOTAL VOLUMETRIC BUDGET
          HEAD
          DRAWDOWN
0                                             COLUMN TO ROW ANISOTROPY =   1.000000
0


                                            DELR WILL BE READ ON UNIT 11 USING FORMAT:            (35F4.0)
                              ------------------------------------------------------------------------------------

   60.000       60.000       60.000       60.000       60.000       60.000       30.000       10.000       10.000       5.0000
   5.0000       5.0000       5.0000       3.0000       2.0000       2.0000       2.0000       2.0000       2.0000       2.0000
   2.0000       3.0000       5.0000       5.0000       5.0000       5.0000       10.000       10.000       30.000       60.000
   60.000       60.000       60.000       60.000       60.000
0


                                            DELC WILL BE READ ON UNIT 11 USING FORMAT:            (35F4.0)
                              ------------------------------------------------------------------------------------

   60.000       60.000       60.000       60.000       60.000       60.000       30.000       10.000       10.000       5.0000
   5.0000       5.0000       5.0000       3.0000       2.0000       2.0000       2.0000       2.0000       2.0000       2.0000
   2.0000       3.0000       5.0000       5.0000       5.0000       5.0000       10.000       10.000       30.000       60.000
   60.000       60.000       60.000       60.000       60.000
0                                                   HYD. COND. ALONG ROWS =  0.3600000E-04 FOR LAYER  1
0                                                                  BOTTOM =  820.0000      FOR LAYER  1
0


                                                    SOLUTION BY THE STRONGLY IMPLICIT PROCEDURE
                                                    -------------------------------------------
0                                           MAXIMUM ITERATIONS ALLOWED FOR CLOSURE =       100
                                                          ACCELERATION PARAMETER =      1.0000
                                               HEAD CHANGE CRITERION FOR CLOSURE =    0.10000E-02
                                               SIP HEAD CHANGE PRINTOUT INTERVAL =        1
0
   5 ITERATION PARAMETERS CALCULATED FROM SPECIFIED WSEED = 0.00100000 :

          0.0000000E+00  0.8221720E+00  0.9683772E+00  0.9943766E+00  0.9990000E+00
1                                              STRESS PERIOD NO.   1, LENGTH =   1728000.
                                               ----------------------------------------------

                                               NUMBER OF TIME STEPS =     20

                                                MULTIPLIER FOR DELT =     1.000

                                             INITIAL TIME STEP SIZE =   86400.00
0**********NODE   1  19   1 (LAYER,ROW,COL) WENT DRY AT ITERATION =  1  TIME STEP =  1  STRESS PERIOD =  1
0
   26 ITERATIONS FOR TIME STEP   1 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   -13.56      (  1, 31,  5) -7.753      (  1, 35,  1)  -9.454      (  1,  3,  1)  -11.39      (  1, 18,  1)  -12.34      (  1, 21, 19)
    1.300      (  1, 18,  1) -0.5703     (  1,  8, 28) -0.9039      (  1,  9, 27)  -1.439      (  1, 15, 27)  -1.785      (  1, 24, 18)
  -0.1178      (  1, 29, 27) -0.7892E-01 (  1, 28, 27) -0.1125      (  1, 16, 10) -0.1277      (  1, 17, 10) -0.1623      (  1, 21, 21)
  -0.1159E-01 (  1,  8, 29)  0.1282E-01 (  1, 11, 11) -0.1807E-01 (  1, 25, 15) -0.1606E-01 (  1, 28, 20) -0.1983E-01 (  1, 25, 26)
   0.2648E-02 (  1, 28, 17) -0.2529E-02 (  1, 20, 20) -0.3166E-02 (  1, 19, 20) -0.4397E-02 (  1, 20, 17) -0.3246E-02 (  1, 27, 23)
  -0.3682E-03 (  1,  9, 30)
0
    1 ITERATIONS FOR TIME STEP   2 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
 ------------------------------------------------------------------------------------------------------------------------------------
   0.1716E-03 (  1, 24, 12)
0
    1 ITERATIONS FOR TIME STEP   3 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.1128E-03 (  1, 24, 12)
0
    1 ITERATIONS FOR TIME STEP   4 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.7612E-04 (  1, 24, 12)
0
    1 ITERATIONS FOR TIME STEP   5 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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   0.5337E-04 (  1, 24, 12)
0
    1 ITERATIONS FOR TIME STEP   6 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.4057E-04 (  1,  7, 31)
0
    1 ITERATIONS FOR TIME STEP   7 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.3389E-04 (  1,  7, 31)
0
    1 ITERATIONS FOR TIME STEP   8 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.2913E-04 (  1,  7, 31)
0
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      1 ITERATIONS FOR TIME STEP   9 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.2691E-04 (  1,   3, 35)
0
      1 ITERATIONS FOR TIME STEP  10 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.2590E-04 (  1,   2, 35)
0
      1 ITERATIONS FOR TIME STEP  11 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.2485E-04 (  1,   1, 35)
0
      1 ITERATIONS FOR TIME STEP  12 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.2369E-04 (  1,   1, 35)
0
      1 ITERATIONS FOR TIME STEP  13 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.2244E-04 (  1,   1, 35)
0
      1 ITERATIONS FOR TIME STEP  14 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.2118E-04 (  1,   1, 35)
0
      1 ITERATIONS FOR TIME STEP  15 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.1997E-04 (  1,   1, 35)
0
      1 ITERATIONS FOR TIME STEP  16 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.1875E-04 (  1,   1, 35)
0
      1 ITERATIONS FOR TIME STEP  17 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.1763E-04 (  1,   1, 35)
0
      1 ITERATIONS FOR TIME STEP  18 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.1655E-04 (  1,   1, 35)
0
      1 ITERATIONS FOR TIME STEP  19 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.1556E-04 (  1,   1, 35)
0
      1 ITERATIONS FOR TIME STEP  20 IN STRESS PERIOD  1
0MAXIMUM HEAD CHANGE FOR EACH ITERATION:
0 HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL HEAD CHANGE LAYER,ROW,COL
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  -0.1454E-04 (  1,   1, 35)
0
1                        HEAD IN LAYER  1 AT END OF TIME STEP 20 IN STRESS PERIOD  1
                 --------------------------------------------------------------------------

               1          2          3          4          5          6          7          8          9         10
              11         12         13         14         15         16         17         18         19         20
              21         22         23         24         25         26         27         28         29         30
              31         32         33         34         35
 ..........................................................................................................................
0  1       862.9      863.2      863.7      864.5      866.0      864.4      863.5      863.2      863.0      862.9
           862.8      862.8      862.7      862.6      862.6      862.6      862.5      862.5      862.5      862.5
           862.4      862.4      862.4      862.3      862.3      862.2      862.1      862.0      861.8      861.5
           861.2      861.0      860.8      860.7      860.7
0  2       862.7      862.9      863.3      863.9      863.0      864.0      863.1      862.8      862.7      862.6
           862.5      862.4      862.4      862.3      862.3      862.3      862.2      862.2      862.2      862.2
           862.2      862.1      862.1      862.0      862.0      861.9      861.9      861.8      861.6      861.3
           861.1      860.9      860.8      860.7      860.7
0  3       862.3      862.4      862.6      862.8      863.0      863.0      862.2      862.0      861.9      861.8
           861.8      861.7      861.7      861.7      861.7      861.6      861.6      861.6      861.6      861.6
           861.6      861.6      861.5      861.5      861.5      861.5      861.4      861.4      861.3      861.1
           860.9      860.8      860.7      860.6      860.6
0  4       861.8      861.8      861.8      861.7      861.2      860.0      860.6      860.7      860.7      860.8
           860.8      860.8      860.8      860.8      860.8      860.8      860.8      860.8      860.8      860.8
           860.8      860.8      860.8      860.8      860.8      860.8      860.8      860.8      860.8      860.7
           860.7      860.6      860.5      860.5      860.5
0  5       861.3      861.3      861.1      860.8      860.2      859.0      859.7      859.9      860.0      860.0
           860.0      860.1      860.1      860.1      860.1      860.2      860.2      860.2      860.2      860.2
           860.2      860.2      860.2      860.2      860.3      860.3      860.3      860.3      860.4      860.4
           860.4      860.4      860.4      860.4      860.4
0  6       860.9      860.8      860.6      860.3      859.7      859.0      859.4      859.5      859.6      859.6
           859.7      859.7      859.7      859.8      859.8      859.8      859.8      859.8      859.8      859.8
           859.8      859.8      859.9      859.9      859.9      859.9      859.9      860.0      860.0      860.1
           860.2      860.2      860.2      860.2      860.2
0  7       860.6      860.5      860.3      860.0      859.5      859.0      859.3      859.4      859.5      859.5
           859.5      859.5      859.6      859.6      859.6      859.6      859.6      859.6      859.6      859.6
           859.6      859.7      859.7      859.7      859.7      859.7      859.8      859.8      859.9      860.0
           860.0      860.1      860.1      860.1      860.1
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0 8	860.6	860.3	860.1	859.9	859.5	859.0	859.3	859.4	859.4	859.4
	859.5	859.5	859.5	859.5	859.5	859.5	859.6	859.6	859.6	859.6
	859.6	859.6	859.6	859.6	859.7	859.7	859.7	859.7	859.8	859.9
	860.0	860.0	860.1	860.1	860.1					
0 9	860.5	860.3	860.1	859.8	859.5	859.0	859.2	859.3	859.4	859.4
	859.4	859.5	859.5	859.5	859.5	859.5	859.5	859.5	859.5	859.6
	859.6	859.6	859.6	859.6	859.6	859.6	859.7	859.7	859.8	859.9
	860.0	860.0	860.0	860.1	860.1					
0 10	860.5	860.2	860.0	859.8	859.4	859.0	859.2	859.3	859.4	859.4
	859.4	859.4	859.5	859.5	859.5	859.5	859.5	859.5	859.5	859.5
	859.5	859.6	859.6	859.6	859.6	859.6	859.6	859.7	859.7	859.8
	859.9	860.0	860.0	860.1	860.1					
0 11	860.5	860.2	860.0	859.8	859.4	859.0	859.2	859.3	859.4	859.4
	859.4	859.4	859.5	859.5	859.5	859.5	859.5	859.5	859.5	859.5
	859.5	859.5	859.6	859.6	859.6	859.6	859.6	859.7	859.7	859.8
	859.9	860.0	860.0	860.0	860.0					
0 12	860.5	860.2	860.0	859.7	859.4	859.0	859.2	859.3	859.4	859.4
	859.4	859.4	859.4	859.5	859.5	859.5	859.5	859.5	859.5	859.5
	859.5	859.5	859.5	859.6	859.6	859.6	859.6	859.6	859.7	859.8
	859.9	860.0	860.0	860.0	860.0					
0 13	860.5	860.1	860.0	859.7	859.4	859.0	859.2	859.3	859.3	859.4
	859.4	859.4	859.4	859.5	859.5	859.5	859.5	859.5	859.5	859.5
	859.5	859.5	859.5	859.5	859.6	859.6	859.6	859.6	859.7	859.8
	859.9	860.0	860.0	860.0	860.0					
0 14	860.5	860.1	859.9	859.7	859.4	859.0	859.2	859.3	859.3	859.4
	859.4	859.4	859.4	859.4	859.5	859.5	859.5	859.5	859.5	859.5
	859.5	859.5	859.5	859.5	859.6	859.6	859.6	859.6	859.7	859.8
	859.9	859.9	860.0	860.0	860.0					
0 15	860.5	860.1	859.9	859.7	859.4	859.0	859.2	859.3	859.3	859.4
	859.4	859.4	859.4	859.4	859.4	859.5	859.5	859.5	859.5	859.5
	859.5	859.5	859.5	859.5	859.5	859.6	859.6	859.6	859.7	859.8
	859.9	859.9	860.0	860.0	860.0					
0 16	860.5	860.1	859.9	859.7	859.4	859.0	859.2	859.3	859.3	859.4
	859.4	859.4	859.4	859.4	859.4	859.5	859.5	859.5	859.5	859.5
	859.5	859.5	859.5	859.5	859.5	859.6	859.6	859.6	859.7	859.8
	859.9	859.9	860.0	860.0	860.0					
0 17	860.5	860.0	859.9	859.7	859.4	859.0	859.2	859.3	859.3	859.4
	859.4	859.4	859.4	859.4	859.4	859.4	859.5	859.5	859.5	859.5
	859.5	859.5	859.5	859.5	859.5	859.6	859.6	859.6	859.7	859.8
	859.9	859.9	860.0	860.0	860.0					
0 18	860.5	860.0	859.9	859.7	859.4	859.0	859.2	859.3	859.3	859.4
	859.4	859.4	859.4	859.4	859.4	859.4	859.5	859.5	859.5	859.5
	859.5	859.5	859.5	859.5	859.5	859.5	859.6	859.6	859.7	859.8
	859.9	859.9	860.0	860.0	860.0					
0 19	1.0000E+30	860.0	859.9	859.7	859.4	859.0	859.2	859.3	859.3	859.4
	859.4	859.4	859.4	859.4	859.4	859.4	859.4	859.5	859.5	859.5
	859.5	859.5	859.5	859.5	859.5	859.5	859.6	859.6	859.7	859.8
	859.9	859.9	860.0	860.0	860.0					
0 20	859.7	860.0	859.9	859.6	859.4	859.0	859.2	859.3	859.3	859.3
	859.4	859.4	859.4	859.4	859.4	859.4	859.4	859.4	859.5	859.5
	859.5	859.5	859.5	859.5	859.5	859.5	859.6	859.6	859.6	859.8
	859.9	859.9	860.0	860.0	860.0					
0 21	859.7	860.0	859.9	859.6	859.3	859.0	859.2	859.3	859.3	859.3
	859.4	859.4	859.4	859.4	859.4	859.4	859.4	859.4	859.5	859.5
	859.5	859.5	859.5	859.5	859.5	859.5	859.6	859.6	859.6	859.7
	859.8	859.9	860.0	860.0	860.0					
0 22	859.7	860.0	859.8	859.6	859.3	859.0	859.2	859.3	859.3	859.3
	859.4	859.4	859.4	859.4	859.4	859.4	859.4	859.4	859.4	859.5
	859.5	859.5	859.5	859.5	859.5	859.5	859.6	859.6	859.6	859.7
	859.8	859.9	860.0	860.0	860.0					
0 23	859.7	859.9	859.8	859.6	859.3	859.0	859.2	859.3	859.3	859.3
	859.4	859.4	859.4	859.4	859.4	859.4	859.4	859.4	859.4	859.4
	859.5	859.5	859.5	859.5	859.5	859.5	859.5	859.6	859.6	859.7
	859.8	859.9	859.9	860.0	860.0					
0 24	859.7	859.9	859.8	859.6	859.3	859.0	859.2	859.3	859.3	859.3
	859.3	859.4	859.4	859.4	859.4	859.4	859.4	859.4	859.4	859.4
	859.4	859.5	859.5	859.5	859.5	859.5	859.5	859.6	859.6	859.7
	859.8	859.9	859.9	860.0	860.0					
0 25	859.7	859.9	859.8	859.6	859.3	859.0	859.2	859.3	859.3	859.3
	859.3	859.4	859.4	859.4	859.4	859.4	859.4	859.4	859.4	859.4
	859.4	859.4	859.5	859.5	859.5	859.5	859.5	859.6	859.6	859.7
	859.8	859.9	859.9	859.9	860.0					
0 26	859.7	859.8	859.7	859.6	859.3	859.0	859.2	859.3	859.3	859.3
	859.3	859.3	859.4	859.4	859.4	859.4	859.4	859.4	859.4	859.4
	859.4	859.4	859.4	859.5	859.5	859.5	859.5	859.5	859.6	859.7
	859.8	859.9	859.9	859.9	860.0					
0 27	859.7	859.8	859.7	859.5	859.3	859.0	859.2	859.2	859.3	859.3
	859.3	859.3	859.4	859.4	859.4	859.4	859.4	859.4	859.4	859.4
	859.4	859.4	859.4	859.4	859.5	859.5	859.5	859.5	859.6	859.7
	859.8	859.8	859.9	859.9	859.9					
0 28	859.7	859.7	859.7	859.5	859.3	859.0	859.2	859.2	859.3	859.3
	859.3	859.3	859.3	859.4	859.4	859.4	859.4	859.4	859.4	859.4
	859.4	859.4	859.4	859.4	859.4	859.5	859.5	859.5	859.6	859.7
	859.8	859.8	859.9	859.9	859.9					
0 29	859.6	859.7	859.6	859.4	859.2	859.0	859.2	859.2	859.2	859.3
	859.3	859.3	859.3	859.3	859.3	859.3	859.3	859.4	859.4	859.4
	859.4	859.4	859.4	859.4	859.4	859.4	859.4	859.5	859.5	859.6
	859.7	859.8	859.8	859.9	859.9					
0 30	859.5	859.5	859.4	859.3	859.2	859.0	859.1	859.2	859.2	859.2
	859.2	859.3	859.3	859.3	859.3	859.3	859.3	859.3	859.3	859.3
	859.3	859.3	859.3	859.3	859.4	859.4	859.4	859.4	859.4	859.5
	859.6	859.7	859.8	859.8	859.8					
0 31	859.3	859.3	859.3	859.2	859.1	859.0	859.1	859.1	859.2	859.2
	859.2	859.2	859.2	859.2	859.2	859.2	859.2	859.2	859.2	859.3
	859.3	859.3	859.3	859.3	859.3	859.3	859.3	859.3	859.4	859.5
	859.5	859.6	859.7	859.7	859.7					
0 32	859.2	859.2	859.1	859.1	859.0	859.0	859.1	859.1	859.1	859.2
	859.2	859.2	859.2	859.2	859.2	859.2	859.2	859.2	859.2	859.2
	859.2	859.2	859.2	859.2	859.2	859.2	859.3	859.3	859.3	859.4
	859.5	859.5	859.6	859.6	859.6					
0 33	859.1	859.1	859.0	859.0	859.0	859.0	859.0	859.1	859.1	859.1
	859.1	859.1	859.1	859.1	859.1	859.1	859.1	859.1	859.2	859.2
	859.2	859.2	859.2	859.2	859.2	859.2	859.2	859.2	859.3	859.3
	859.4	859.5	859.5	859.6	859.6					
0 34	859.0	859.0	858.9	858.9	859.0	858.9	859.0	859.0	859.0	859.0
	859.0	859.1	859.1	859.1	859.1	859.1	859.1	859.1	859.1	859.1
	859.1	859.1	859.1	859.1	859.1	859.1	859.2	859.2	859.2	859.3
	859.4	859.5	859.5	859.5	859.6					

Constant head erroneously put at 800' should not affect del.

0 35	859.0	858.9	858.8	858.6	858.0	858.6	858.8	858.9	858.9	859.0
	859.0	859.0	859.0	859.0	859.0	859.0	859.0	859.0	859.0	859.0
	859.1	859.1	859.1	859.1	859.1	859.1	859.1	859.1	859.2	859.3
	859.4	859.4	859.5	859.5	859.5					

1 DRAWDOWN IN LAYER 1 AT END OF TIME STEP 20 IN STRESS PERIOD 1

	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
	21	22	23	24	25	26	27	28	29	30
	31	32	33	34	35					
0 1	17.07	16.84	16.35	15.47	0.0000E+00	15.58	16.48	16.82	16.99	17.10
	17.17	17.25	17.32	17.37	17.40	17.43	17.45	17.48	17.50	17.53
	17.55	17.58	17.63	17.69	17.75	17.80	17.88	17.98	18.16	18.50
	18.81	19.03	19.17	19.25	19.29					
0 2	17.29	17.12	16.74	16.09	0.0000E+00	0.0000E+00	16.88	17.20	17.34	17.45
	17.51	17.57	17.64	17.68	17.71	17.74	17.76	17.78	17.80	17.82
	17.84	17.87	17.91	17.96	18.01	18.06	18.12	18.21	18.36	18.65
	18.92	19.10	19.22	19.30	19.33					
0 3	17.69	17.60	17.43	17.20	16.97	0.0000E+00	17.77	18.00	18.10	18.17
	18.21	18.25	18.29	18.32	18.34	18.35	18.37	18.38	18.39	18.41
	18.42	18.44	18.46	18.49	18.52	18.55	18.59	18.64	18.74	18.92
	19.10	19.23	19.32	19.38	19.41					
0 4	18.18	18.18	18.20	18.33	18.75	0.0000E+00	19.43	19.31	19.27	19.24
	19.23	19.22	19.21	19.20	19.20	19.20	19.20	19.19	19.19	19.19
	19.19	19.19	19.19	19.19	19.19	19.19	19.19	19.19	19.21	19.26
	19.34	19.41	19.46	19.49	19.51					
0 5	18.67	18.74	18.88	19.18	19.79	0.0000E+00	20.32	20.12	20.04	19.98
	19.95	19.92	19.89	19.87	19.86	19.85	19.84	19.83	19.82	19.81
	19.80	19.79	19.78	19.76	19.74	19.73	19.70	19.68	19.64	19.59
	19.59	19.60	19.61	19.63	19.63					
0 6	19.11	19.22	19.42	19.74	20.26	0.0000E+00	20.61	20.47	20.40	20.36
	20.33	20.30	20.27	20.25	20.24	20.23	20.22	20.21	20.20	20.19
	20.18	20.17	20.15	20.13	20.11	20.09	20.06	20.03	19.97	19.88
	19.81	19.78	19.77	19.77	19.76					
0 7	19.36	19.53	19.73	20.03	20.45	0.0000E+00	20.71	20.60	20.54	20.51
	20.48	20.46	20.43	20.41	20.40	20.39	20.38	20.38	20.37	20.36
	20.35	20.34	20.32	20.30	20.29	20.27	20.24	20.21	20.15	20.04
	19.96	19.91	19.88	19.87	19.86					
0 8	19.44	19.65	19.86	20.13	20.52	0.0000E+00	20.74	20.64	20.59	20.56
	20.53	20.51	20.49	20.47	20.46	20.45	20.44	20.43	20.43	20.42
	20.41	20.40	20.39	20.37	20.35	20.33	20.31	20.27	20.22	20.11
	20.02	19.96	19.93	19.91	19.90					
0 9	19.48	19.72	19.92	20.18	20.55	0.0000E+00	20.76	20.66	20.61	20.58
	20.56	20.53	20.51	20.50	20.49	20.48	20.47	20.46	20.45	20.45
	20.44	20.43	20.41	20.40	20.38	20.36	20.34	20.31	20.25	20.14
	20.05	19.99	19.95	19.93	19.92					
0 10	19.50	19.77	19.96	20.22	20.57	0.0000E+00	20.77	20.67	20.63	20.59
	20.57	20.55	20.53	20.51	20.50	20.50	20.49	20.48	20.47	20.47
	20.46	20.45	20.43	20.42	20.40	20.38	20.36	20.33	20.27	20.16
	20.07	20.01	19.97	19.95	19.94					
0 11	19.51	19.80	19.99	20.24	20.58	0.0000E+00	20.77	20.68	20.64	20.60
	20.58	20.56	20.54	20.53	20.52	20.51	20.50	20.49	20.49	20.48
	20.47	20.46	20.45	20.43	20.41	20.40	20.37	20.34	20.28	20.18
	20.08	20.02	19.98	19.96	19.95					
0 12	19.52	19.84	20.02	20.26	20.60	0.0000E+00	20.78	20.69	20.65	20.61
	20.59	20.57	20.55	20.54	20.53	20.52	20.51	20.50	20.50	20.49
	20.48	20.47	20.46	20.44	20.42	20.41	20.38	20.35	20.30	20.19
	20.09	20.03	19.99	19.97	19.96					
0 13	19.53	19.87	20.05	20.29	20.61	0.0000E+00	20.79	20.70	20.65	20.62
	20.60	20.58	20.56	20.55	20.54	20.53	20.52	20.52	20.51	20.50
	20.49	20.49	20.47	20.45	20.44	20.42	20.40	20.37	20.31	20.20
	20.11	20.04	20.00	19.98	19.97					
0 14	19.54	19.90	20.07	20.30	20.62	0.0000E+00	20.79	20.70	20.66	20.63
	20.61	20.59	20.57	20.56	20.55	20.54	20.53	20.52	20.52	20.51
	20.50	20.49	20.48	20.46	20.45	20.43	20.41	20.38	20.32	20.21
	20.12	20.05	20.01	19.99	19.98					
0 15	19.54	19.92	20.08	20.31	20.63	0.0000E+00	20.79	20.71	20.66	20.63
	20.61	20.60	20.58	20.56	20.55	20.54	20.54	20.53	20.52	20.52
	20.51	20.50	20.49	20.47	20.45	20.44	20.41	20.38	20.33	20.22
	20.12	20.06	20.02	19.99	19.98					
0 16	19.54	19.94	20.09	20.32	20.63	0.0000E+00	20.79	20.71	20.67	20.64
	20.62	20.60	20.58	20.56	20.56	20.55	20.54	20.53	20.53	20.52
	20.51	20.50	20.49	20.47	20.46	20.44	20.42	20.39	20.33	20.23
	20.13	20.06	20.02	20.00	19.99					
0 17	19.54	19.95	20.10	20.33	20.64	0.0000E+00	20.80	20.71	20.67	20.64
	20.62	20.60	20.58	20.57	20.56	20.55	20.55	20.54	20.53	20.52
	20.52	20.51	20.49	20.48	20.46	20.45	20.42	20.39	20.34	20.23
	20.13	20.07	20.03	20.00	19.99					
0 18	19.54	19.97	20.11	20.34	20.64	0.0000E+00	20.80	20.72	20.67	20.64
	20.63	20.61	20.59	20.57	20.56	20.56	20.55	20.54	20.54	20.53
	20.52	20.51	20.50	20.48	20.47	20.45	20.43	20.40	20.34	20.24
	20.14	20.07	20.03	20.01	20.00					
0 19	1.0000E+30	19.98	20.13	20.35	20.64	0.0000E+00	20.80	20.72	20.68	20.65
	20.63	20.61	20.59	20.58	20.57	20.56	20.55	20.55	20.54	20.53
	20.53	20.52	20.50	20.49	20.47	20.46	20.43	20.40	20.35	20.24
	20.14	20.08	20.04	20.01	20.00					
0 20	20.29	20.00	20.14	20.35	20.65	0.0000E+00	20.80	20.72	20.68	20.65
	20.63	20.61	20.59	20.58	20.57	20.56	20.56	20.55	20.54	20.54
	20.53	20.52	20.51	20.49	20.48	20.46	20.44	20.41	20.35	20.25
	20.15	20.08	20.04	20.02	20.00					
0 21	20.29	20.02	20.15	20.36	20.65	0.0000E+00	20.80	20.72	20.68	20.65
	20.64	20.62	20.60	20.58	20.58	20.57	20.56	20.55	20.55	20.54
	20.53	20.52	20.51	20.50	20.48	20.46	20.44	20.41	20.36	20.25
	20.15	20.09	20.04	20.02	20.01					
0 22	20.29	20.03	20.16	20.37	20.66	0.0000E+00	20.81	20.73	20.69	20.66
	20.64	20.62	20.60	20.59	20.58	20.57	20.57	20.56	20.55	20.55
	20.54	20.53	20.52	20.50	20.48	20.47	20.45	20.42	20.36	20.26
	20.16	20.09	20.05	20.02	20.01					
0 23	20.30	20.06	20.18	20.39	20.67	0.0000E+00	20.81	20.73	20.69	20.66
	20.65	20.63	20.61	20.60	20.59	20.58	20.57	20.57	20.56	20.55
	20.55	20.54	20.52	20.51	20.49	20.48	20.46	20.43	20.37	20.27
	20.17	20.10	20.06	20.03	20.02					
0 24	20.30	20.10	20.20	20.41	20.68	0.0000E+00	20.82	20.74	20.70	20.67
	20.65	20.64	20.62	20.60	20.60	20.59	20.58	20.58	20.57	20.56
	20.56	20.55	20.53	20.52	20.50	20.49	20.47	20.44	20.38	20.28
	20.18	20.11	20.07	20.04	20.03					

0 25	20.31	20.13	20.23	20.42	20.69	0.0000E+00	20.82	20.74	20.71	20.68
	20.66	20.64	20.63	20.61	20.60	20.60	20.59	20.58	20.58	20.57
	20.56	20.56	20.54	20.53	20.51	20.50	20.48	20.45	20.39	20.29
	20.19	20.12	20.08	20.05	20.04					
0 26	20.31	20.16	20.25	20.44	20.70	0.0000E+00	20.82	20.75	20.71	20.69
	20.67	20.65	20.63	20.62	20.61	20.61	20.60	20.59	20.59	20.58
	20.57	20.57	20.55	20.54	20.52	20.51	20.49	20.46	20.41	20.30
	20.20	20.14	20.09	20.06	20.05					
0 27	20.33	20.20	20.29	20.47	20.71	0.0000E+00	20.83	20.76	20.72	20.70
	20.68	20.66	20.64	20.63	20.62	20.62	20.61	20.60	20.60	20.59
	20.59	20.58	20.57	20.55	20.54	20.52	20.50	20.47	20.42	20.32
	20.22	20.15	20.10	20.08	20.06					
0 28	20.34	20.25	20.33	20.50	20.73	0.0000E+00	20.84	20.77	20.73	20.71
	20.69	20.67	20.66	20.65	20.64	20.63	20.63	20.62	20.61	20.61
	20.60	20.59	20.58	20.57	20.55	20.54	20.52	20.49	20.44	20.34
	20.24	20.17	20.12	20.10	20.08					
0 29	20.39	28.34	20.41	20.56	20.77	0.0000E+00	20.85	20.79	20.75	28.73
	20.72	20.70	20.69	20.67	20.67	20.66	20.65	20.65	20.64	20.64
	20.63	20.62	20.61	20.60	20.59	20.57	20.55	20.53	20.48	20.38
	20.28	20.21	20.16	20.13	20.12					
0 30	20.51	20.51	20.57	20.68	20.83	0.0000E+00	20.87	20.82	20.79	20.77
	20.76	20.75	20.73	20.72	20.72	20.71	20.71	20.70	20.70	20.69
	20.69	20.66	20.67	20.66	20.65	20.64	20.62	20.60	20.55	20.46
	20.37	20.29	20.24	20.21	20.19					
0 31	20.66	20.68	20.73	20.81	20.91	0.0000E+00	20.90	20.85	20.83	20.82
	20.80	20.79	20.78	20.77	20.77	20.77	20.76	20.76	20.75	20.75
	20.74	20.74	20.73	20.72	20.71	20.70	20.69	20.67	20.63	20.55
	20.46	20.38	20.33	20.30	20.28					
0 32	20.79	20.81	20.85	20.92	0.0000E+00	20.97	20.91	20.88	20.86	20.85
	20.84	20.83	20.82	20.82	20.81	20.81	20.81	20.80	20.80	20.79
	20.79	20.79	20.78	20.77	20.76	20.75	20.74	20.72	20.69	20.61
	20.52	20.45	20.40	20.37	20.35					
0 33	20.90	20.92	20.96	21.00	0.0000E+00	21.00	20.95	20.92	20.91	20.90
	20.89	20.88	20.87	20.87	20.86	20.86	20.85	20.85	20.85	20.84
	20.84	20.84	20.83	20.82	20.81	20.80	20.79	20.77	20.74	20.66
	20.58	20.51	20.46	20.42	20.40					
0 34	20.98	21.01	21.08	21.13	0.0000E+00	21.10	21.04	21.00	20.98	20.97
	20.95	20.94	20.93	20.93	20.92	20.92	20.91	20.91	20.90	20.90
	20.90	20.89	20.88	20.87	20.86	20.85	20.84	20.82	20.78	20.70
	20.61	20.54	20.49	20.46	20.44					
0 35	21.03	21.08	21.20	21.44	0.0000E+00	21.40	21.18	21.10	21.07	21.04
	21.03	21.01	21.00	20.99	20.98	20.97	20.97	20.96	20.96	20.95
	20.95	20.94	20.93	20.92	20.90	20.89	20.87	20.85	20.81	20.72
	20.63	20.56	20.51	20.47	20.46					

0

VOLUMETRIC BUDGET FOR ENTIRE MODEL AT END OF TIME STEP 20 IN STRESS PERIOD 1

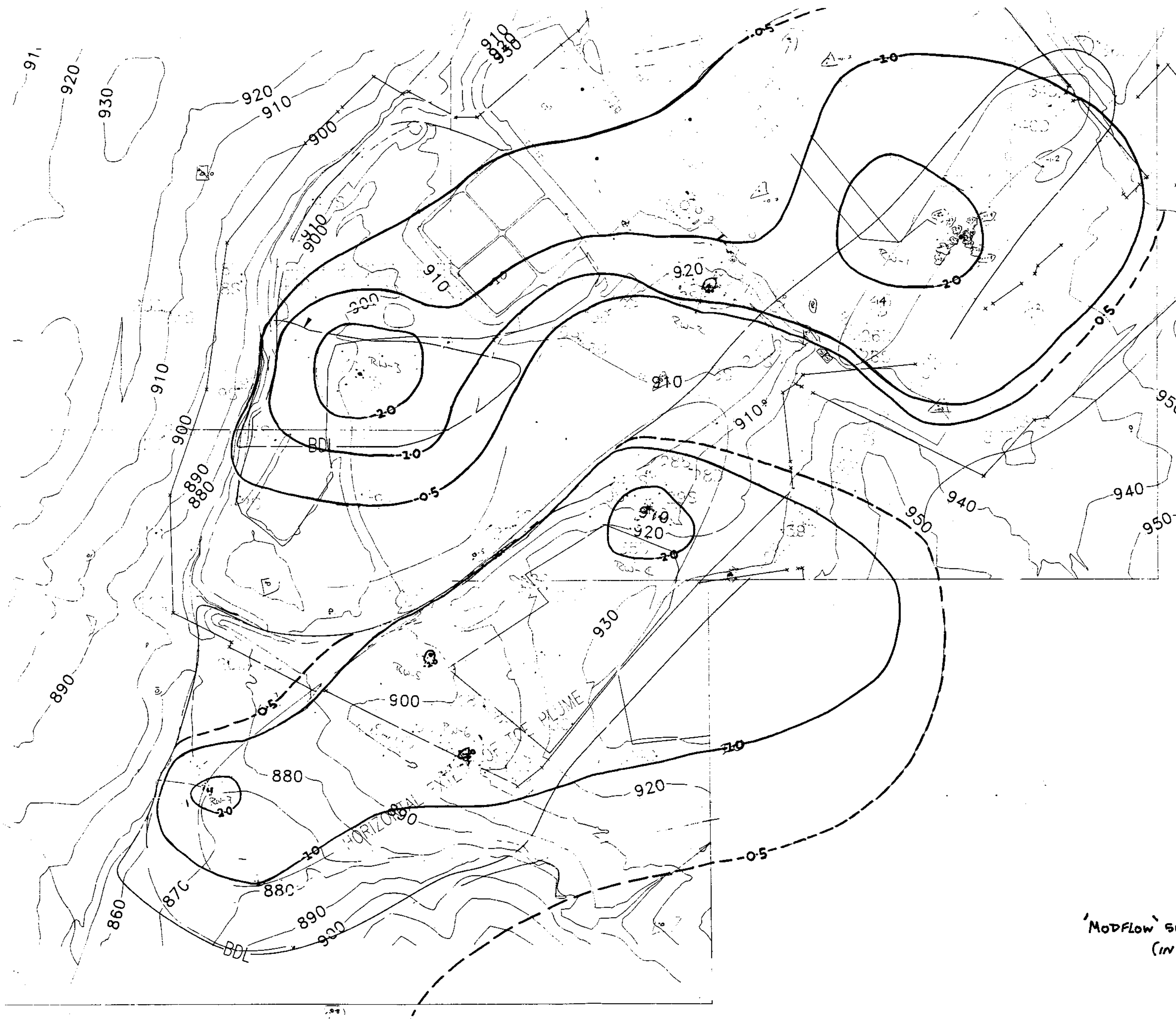
	CUMULATIVE VOLUMES	L**3	RATES FOR THIS TIME STEP	L**3/T
0	IN:		IN:	
	STORAGE =	0.00000E+00	STORAGE =	0.00000E+00
	CONSTANT HEAD =	23490.	CONSTANT HEAD =	0.13594E-01
0	TOTAL IN =	23490.	TOTAL IN =	0.13594E-01
0	OUT:		OUT:	
	STORAGE =	0.00000E+00	STORAGE =	0.00000E+00
	CONSTANT HEAD =	23490.	CONSTANT HEAD =	0.13594E-01
0	TOTAL OUT =	23490.	TOTAL OUT =	0.13594E-01
0	IN - OUT =	-0.60742	IN - OUT =	0.14342E-06
0	PERCENT DISCREPANCY =	0.00	PERCENT DISCREPANCY =	0.00

0

TIME SUMMARY AT END OF TIME STEP 20 IN STRESS PERIOD 1

	SECONDS	MINUTES	HOURS	DAYS	YEARS
TIME STEP LENGTH	86400.0	1440.00	24.0000	1.00000	0.273785E-02
STRESS PERIOD TIME	0.172800E+07	28800.0	480.000	20.0000	0.547570E-01
TOTAL SIMULATION TIME	0.172800E+07	28800.0	480.000	20.0000	0.547570E-01

1



'MODFLOW' SIMULATED DRAWDOWNS
(IN FEET)

APPENDIX D

NPDES Permit

APPENDIX D

NPDES Permit

PERMIT NO. GA 0000507

STATE OF GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Georgia Water Quality Control Act (Georgia Laws 1964, p. 416, as amended), hereinafter called the "State Act," the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq.), hereinafter called the "Federal Act," and the Rules and Regulations promulgated pursuant to each of these Acts,

THE WILLIAM L. BONNELL COMPANY, INC.
P. O. Box 428
Newnan, Georgia 30264

is authorized to discharge from a facility located at

25 Bonnell Street
Newnan, Coweta County, Georgia

to receiving waters Mineral Springs Branch

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I, II, and III hereof.

This permit shall become effective on January 23, 1990.

This permit and the authorization to discharge shall expire at midnight, December 1, 1994.

Signed this 23rd day of January, 1990.

J. Leonard Ledbetter
Director,
Environmental Protection Division

EPD 2.21-1

EPD 2.21-2

STATE OF GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

2. During the period beginning December 31, 1990 and lasting through December 1, 1994, the permittee is authorized to discharge from outfall(s) serial number(s) 001 - Wastewater Treatment Plant.

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations: Mass Based (lbs/day) Daily Avg.	Mass Based (lbs/day) Daily Max.	Concentration Based Daily Avg.	Concentration Based Daily Max.	Monitoring Requirements: Measurement Frequency*	Sample Type	Sample Location
Flow (MGD)	-	-	-	-	Continuous	Recorder	Final Effl
Total Suspended Solids	88	175	-	-	1/Week	24-Hr.Comp.	Final Effl
Total Aluminum	11.3	22.8	-	-	1/Week	24-Hr.Comp.	Final Effl
Total Phosphorus	6.0	12.0	-	-	1/week	24-Hr.Comp.	Final Eff
Oil & Grease	80	115	-	-	1/week	Grab	Final Eff
Total Chromium	0.47	1.13	370 μg/l	370 μg/l	1/week	24-Hr.Comp.	Final Eff
Copper	-	-	-	21 μg/l	1/Quarter	24-Hr.Comp.	Final Eff
Lead**	-	-	-	-	1/Year	24-Hr.Comp.	Final Eff
Nickel	-	-	-	280 μg/l	1/Quarter	24-Hr.Comp.	Final Eff
Silver**	-	-	-	-	1/Year	24-Hr.Comp.	Final Eff
Zinc	1.40	3.76	190 μg/l	190 μg/l	1/Quarter	24-Hr.Comp.	Final Eff
Total Cyanide**	0.32	0.76	5.2 μg/l	5.2 μg/l	1/Quarter	Grab	Final Eff
BOD_5	-	208	-	-	1/Year	24-Hr.Comp.	Final Eff
Dissolved Oxygen***	-	-	6.0 mg/l Minimum		1/Week	Grab	Final Eff

The pH shall not be less than 7.0 standard units nor greater than 9.0 standard units and shall be monitored daily by a grab sample of the final effluent.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

* For purposes of this permit, once per quarter samples shall be taken during the months of March, June, September and December, and once per year samples shall be taken during the month of July.

** See Part III.B., Special Requirement No. 1 for additional monitoring, reporting and compliance information.

*** The final effluent shall have a minimum dissolved oxygen concentration of 6.0 mg/l at all times.

EPD 2.21-1

STATE OF GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning effective date and lasting through December 30, 1990, the permittee is authorized to discharge from outfall(s) serial number(s) 001 - Wastewater Treatment Plant.

Such discharges shall be limited and monitored by the permittee as specified below:

Parameter Code	Effluent Characteristic	Discharge Limitations				Monitoring Requirements		
		Mass Based (lbs/day)		Concentration Based				
		Daily Avg.	Daily Max.	Daily Avg.	Daily Max.	Measurement Frequency*	Sample Type	Sample Location
50050	Flow (MGD)	-	-	-	-	Continuous	Recorder	Final Effl
533	Total Suspended Solids	88	175	-	-	1/Week	24-Hr.Comp.	Final Effl
1105	Total Aluminum	11.3	22.8	-	-	1/Week	24-Hr.Comp.	Final Effl
665	Total Phosphorus	6.0	12.0	-	-	1/week	24-Hr.Comp.	Final Effl
550	Oil & Grease	80	115	-	-	1/week	Grab	Final Effl
1134	Total Chromium	0.47	1.13	370 µg/1	370 µg/1	1/week	24-Hr.Comp.	Final Effl
1042	Copper	-	-	-	-	1/Quarter	24-Hr.Comp.	Final Effl
1051	Lead	-	-	-	-	1/Year	24-Hr.Comp.	Final Effl
1067	Nickel	-	-	-	280 µg/1	1/Quarter	24-Hr.Comp.	Final Effl
1077	Silver	-	-	-	-	1/Year	24-Hr.Comp.	Final Effl
1092	Zinc	1.40	3.76	190 µg/1	190 µg/1	1/Quarter	24-Hr.Comp.	Final Effl
720	Total Cyanide**	0.32	0.76	5.2 µg/1	5.2 µg/1	1/Quarter	Grab	Final Effl
310	BOD_5	-	208	-	-	1/Year	24-Hr.Comp.	Final Effl
300	Dissolved Oxygen***	-	-	6.0 mg/1 Minimum		1/Week	Grab	Final Effl

400 The pH shall not be less than 7.0 standard units nor greater than 9.0 standard units and shall be monitored daily by a grab sample of the final effluent.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

* For purposes of this permit, once per quarter samples shall be taken during the months of March, June, September and December, and once per year samples shall be taken during the month of July.

** See Part III.B., Special Requirement No. 1 for additional monitoring, reporting and compliance information.

*** The final effluent shall have a minimum dissolved oxygen concentration of 6.0 mg/1 at all times.

B. SCHEDULE OF COMPLIANCE

1. The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule:

   With the exception of Copper, all effluent limitations are effective immediately upon issuance of this permit. The water quality-based effluent limitation for Copper shall become effective December 31, 1990. The permittee shall achieve compliance with this effluent limitation in accordance with the following schedule:

February 1, 1990	- Submittal of a preliminary investigation report together with the results of any treatability tests.
April 1, 1990	- Submittal of plans and specifications for any necessary upgrading of the existing wastewater treatment facility.
June 1, 1990	- Begin construction of facility modifications.
August 1, 1990	- Submittal of first progress report.
October 1, 1990	- Submittal of second progress report.
December 1, 1990	- Complete construction and commence start-up testing of facility modifications.
December 31, 1990	- Submittal of final project report, and attain compliance with final effluent limitations.

2. No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

Note: EPD as used herein means the Environmental Protection Division of the Department of Natural Resources.

C. MONITORING AND REPORTING

1. Representative Sampling

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. Reporting

Monitoring results obtained during the previous one month shall be summarized for each month and reported on an Operation Monitoring Report (Form WQ 1.45). Forms other than Form WQ 1.45 may be used upon approval by EPD. These forms and any other required reports and information shall be completed, signed and certified by a principal executive officer or ranking elected official, or by a duly authorized representative of that person who has the authority to act for or on behalf of that person, and submitted to the Division, postmarked no later than the 15th day of the month following the reporting period. Signed copies of these and all other reports required herein shall be submitted to the following address:

Georgia Environmental Protection Division
Industrial Wastewater Program
205 Butler Street, S.E.
Floyd Towers East, Room 1070
Atlanta, Georgia 30334

All instances of noncompliance not reported under Part I. B. and C. and Part II. A shall be reported at the time the operation monitoring report is submitted.

3. Definitions

a. The "daily average" discharge means the total discharge by weight during a calendar month divided by the number of days in the month that the production or commercial facility was operating. Where less than daily sampling is required by this permit, the daily average discharge shall be determined by the summation of all the measured daily discharges by weight divided by the number of days sampled during the calendar month when the measurements were made.

b. The "daily maximum" discharge means the total discharge by weight during any calendar day.

c. The "daily average" concentration means the arithmetic average of all the daily determinations of concentration made during a calendar month. Daily determinations of concentration made using a composite sample shall be the concentration of the composite sample.

d. The "daily maximum" concentration means the daily determination of concentration for any calendar day.

e. For the purpose of this permit, a calendar day is defined as any consecutive 24-hour period.

f. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.

g. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

4. Test Procedures

Monitoring must be conducted according to test procedures approved pursuant to 40 CFR 136 unless other test procedures have been specified in this permit.

5. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. The exact place, date, and time of sampling or measurements, and the person(s) performing the sampling or the measurements;

b. The dates the analyses were performed, and the person(s) who performed the analyses;

c. The analytical techniques or methods used; and

d. The results of all required analyses.

6. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Operation Monitoring Report Form (WQ 1.45). Such increased monitoring frequency shall also be indicated. The Division may require by written notification more frequent monitoring or the monitoring of other pollutants not required in this permit.

7. Records Retention

The permittee shall retain records of all monitoring information, including all records of analyses performed, calibration and maintenance of instrumentation, recordings from continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Division at any time.

8. Penalties

The Federal Clean Water Act and the Georgia Water Quality Control Act provide that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit, makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine or by imprisonment, or by both. The Federal Clean Water Act and the Georgia Water Quality Control Act also provide procedures for imposing civil penalties which may be levied for violations of the Act, any permit condition or limitation established pursuant to the Act, or negligently or intentionally failing or refusing to comply with any final or emergency order of the Director of the Division.

A. MANAGEMENT REQUIREMENTS

1. Change in Discharge

a. Advance notice to the Division shall be given of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. Any anticipated facility expansions, production increases, or process modifications must be reported by submission of a new NPDES permit application or, if such changes will not violate the effluent limitations specified in this permit, by notice to the Division of such changes. Following such notice, the permit may be modified to specify and limit any pollutants not previously limited.

b. All existing manufacturing, commercial, mining, and silvicultural dischargers shall notify the Division as soon as it is known or there is reason to believe that any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant not limited in the permit, if that discharge will exceed (i) 100 µg/l, (ii) five times the maximum concentration reported for that pollutant in the permit application, or (iii) 200 µg/l for acrolein and acrylonitrile, 500 µg/l for 2,4 dinitrophenol and for 2-methyl-4-6-dinitrophenol, or 1 mg/l antimony.

c. All existing manufacturing, commercial, mining, and silvicultural dischargers shall notify the Division as soon as it is known or there is reason to believe that any activity has occurred or will occur which would result in any discharge on a nonroutine or infrequent basis, of any toxic pollutant not limited in the permit, if that discharge will exceed (i) 500 µg/l, (ii) ten times the maximum concentration reported for that pollutant in the permit application, or (iii) 1 mg/l antimony.

2. Noncompliance Notification

If, for any reason, the permittee does not comply with, or will be unable to comply with any effluent limitation specified in this permit, the permittee shall provide the Division with an oral report within 24 hours from the time the permittee becomes aware of the circumstances followed by a written report within five (5) days of becoming aware of such condition. The written submission shall contain the following information:

a. A description of the discharge and cause of noncompliance; and

b. The period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

3. Facilities Operation

The permittee shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

4. Adverse Impact

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

5. Bypassing

a. If the permittee knows in advance of the need for a bypass, it shall submit prior notice to the Division at least 10 days (if possible) before the date of the bypass. The permittee shall submit notice of any unanticipated bypass with an oral report within 24 hours from the time the permittee becomes aware of the circumstances followed by a written report within five (5) days of becoming aware of such condition. The written submission shall contain the following information:

1. A description of the discharge and cause of noncompliance; and

2. The period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

b. Any diversion from or bypass of facilities covered by this permit is prohibited, except (i) where unavoidable to prevent loss of life, personal injury, or severe property damage; (ii) there were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime (this condition is not satisfied if the permittee could have installed adequate back-up equipment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance); and (iii) the permittee submitted a notice as required above. The permittee shall operate the treatment works, including the treatment plant and total sewer system, to minimize discharge of the pollutants listed in Part I of this permit from combined sewer overflows or bypasses. Upon written notification by the Division, the permittee may be required to submit a plan and schedule for reducing bypasses, overflows, and infiltration in the system.

6. Sludge Disposal Requirements

Hazardous sludge shall be disposed of in accordance with the regulations and guidelines established by the Division pursuant to the Federal Clean Water Act (CWA) and the Resource Conservation and Recovery Act (RCRA). For land application of nonhazardous sludge, the permittee shall comply with any applicable criteria outlined in the Division's "Guidelines for Land Application of Municipal Sludges." Prior to disposal of sludge by land application, the permittee shall submit a proposal to the Division for approval in accordance with applicable criteria in the Division's "Guidelines for Land Application of Municipal Sludges." Upon evaluation of the permittee's proposal, the Division may require that more stringent control of this activity is required. Upon written notification, the permittee shall submit to the Division for approval, a detailed plan of operation for land application of sludge. Upon approval, the plan will become a part of the NPDES permit. Disposal of nonhazardous sludge by other means, such as landfilling, must be approved by the Division.

7. Sludge Monitoring Requirements

The permittee shall develop and implement procedures to insure adequate year-round sludge disposal. The permittee shall monitor the volume and concentration of solids removed from the plant. Records shall be maintained which document the quantity of solids removed from the plant. The ultimate disposal of solids shall be reported monthly (in the unit of lbs/day) to the Division with the Operation Monitoring Report Forms required under Part I (C)(2) of this permit.

8. Power Failures

Upon the reduction, loss, or failure of the primary source of power to said water pollution control facilities, the permittee shall use an alternative source of power if available to reduce or otherwise control production and/or all discharges in order to maintain compliance with the effluent limitations and prohibitions of this permit.

If such alternative power source is not in existence, and no date for its implementation appears in Part I, the permittee shall halt, reduce or otherwise control production and/or all discharges from wastewater control facilities upon the reduction, loss, or failure of the primary source of power to said wastewater control facilities.

B. RESPONSIBILITIES

1. Right of Entry

The permittee shall allow the Director of the Division, the Regional Administrator of EPA, and/or their authorized representatives, agents, or employees, upon the presentation of credentials:

a. To enter upon the permittee's premises where a regulated activity or facility is located or conducted or where any records are required to be kept under the terms and conditions of this permit; and

b. At reasonable times, to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and to sample any substance or parameters in any location.

2. Transfer of Ownership or Control

A permit may be transferred to another person by a permittee if:

a. The permittee notifies the Director in writing of the proposed transfer at least thirty (30) days in advance of the proposed transfer;

b. A written agreement containing a specific date for transfer of permit responsibility and coverage between the current and new permittee (including acknowledgement that the existing permittee is liable for violations up to that date, and that the new permittee is liable for violations from that date on) is submitted to the Director at least thirty (30) days in advance of the proposed transfer; and

c. The Director, within thirty (30) days, does not notify the current permittee and the new permittee of the Division's intent to modify, revoke and reissue, or terminate the permit and to require that a new application be filed rather than agreeing to the transfer of the permit.

3. Availability of Reports

Except for data deemed to be confidential under O.C.G.A. § 12-5-26 or by the Regional Administrator of the EPA under the Code of Federal Regulations, Title 40, Part 2, all reports prepared in accordance with the terms of this permit shall be available for public inspection at an office of the Division. Effluent data, permit applications, permittee's names and addresses, and permits shall not be considered confidential.

4. Permit Modification

After written notice and opportunity for a hearing, this permit may be modified, suspended, revoked or reissued in whole or in part during its term for cause including, but not limited to, the following:

a. Violation of any conditions of this permit;

b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;

c. A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge; or

d. To comply with any applicable effluent limitation issued pursuant to the order the United States District Court for the District of Columbia issued on June 8, 1976, in <u>Natural Resources Defense Council, Inc. et.al.</u> v. <u>Russell E. Train</u>, <u>8 ERC 2120(D.D.C. 1976)</u>, if the effluent limitation so issued:

   (1) is different in conditions or more stringent than any effluent limitation in the permit; or

   (2) controls any pollutant not limited in the permit.

5. Toxic Pollutants and Best Available Technology Economically Achievable

The permittee shall comply with effluent standards or prohibitions established pursuant to Section 307(a) and Section 301(b)2 of the Federal Clean Water Act for pollutants, toxic and otherwise, which are present in the discharge within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

6. Civil and Criminal Liability

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

7. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Federal Clean Water Act.

8. Water Quality Standards

Nothing in this permit shall be construed to preclude the modification of any condition of this permit when it is determined that the effluent limitations specified herein fail to achieve the applicable State water quality standards.

9. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

10. Expiration of Permit

Permittee shall not discharge after the expiration date. In order to receive authorization to discharge beyond the expiration date, the permittee shall submit such information, forms, and fees as are required by the agency authorized to issue permits no later than 180 days prior to the expiration date.

11. Contested Hearings

Any person who is aggrieved or adversely affected by an action of the Director of the Division shall petition the Director for a hearing within thirty (30) days of notice of such action.

12. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

13. Best Management Practices

The permittee will implement best management practices to control the discharge of hazardous and/or toxic materials from ancillary manufacturing activities. Such activities include, but are not limited to, materials storage areas; in-plant transfer, process and material handling areas; loading and unloading operations; plant site runoff; and sludge and waste disposal areas.

14. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

15. Duty to Provide Information

a. The permittee shall furnish to the Director of the Division, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish upon request copies of records required to be kept by this permit.

b. When the permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or any report to the Director, it shall promptly submit such facts and information.

16. Stormwater Runoff

In addition to the outfalls identified in Part I, Section A. of this permit, the permittee is authorized to discharge stormwater runoff from point sources at this facility provided that these discharges do not cause violations of State water quality standards in the receiving streams.

17. Upset Provisions

Provisions of 40 CFR 122.41(n)(1)-(4), regarding "Upset" shall be applicable to any civil, criminal, or administrative proceeding brought to enforce this permit.

PART III

A. PREVIOUS PERMITS

1. All previous State water quality permits issued to this facility, whether for construction or operation, are hereby revoked by the issuance of this permit. This action is taken to assure compliance with the Georgia Water Quality Control Act, as amended, and the Federal Clean Water Act, as amended. Receipt of the permit constitutes notice of such action. The conditions, requirements, terms and provisions of this permit authorizing discharge under the National Pollutant Discharge Elimination System govern discharges from this facility.

B. SPECIAL REQUIREMENTS

1. For Lead, Silver and Total Cyanide, the permittee shall use the most sensitive test procedure approved pursuant to 40 CFR 136. A reading of not detected (ND) shall be interpreted to be in compliance with the specified effluent limitation. Whenever ND is reported, the permittee shall also specify the detection limit being utilized. In no case shall the detection limit be greater than the EPD analytical laboratory detection limit specified in Chapter 391-3-6-.06(4)(d)5(i) of the Georgia Rules and Regulations for Water Quality Control.

C. BIOMONITORING AND TOXICITY REDUCTION REQUIREMENTS

The permittee may not discharge toxic wastes in concentrations or combinations which are harmful to humans, fish or aquatic life. The permittee shall ensure that the effluent being discharged does not kill 10% or more of the exposed test organisms in 96 hours or less, when the test solution contains volumes of effluent and stream water proportional to the plant design flow and the 7Q10 flow of the receiving stream.

1. If toxicity is suspected in the permittee's effluent, the Division may require the permittee to develop a program for whole effluent biomonitoring. The schedule will be as follows;

   a. Within 90 days of Division notification, a study plan detailing the test methodology and test organisms shall be submitted for conducting forty-eight hour acute static renewal tests of the final effluent. If residual chlorine is present in the final effluent from treatment and/or disinfection processes, a prechlorinated or dechlorinated sample will also be tested.

   b. Within 90 days of Division approval of the study plan, the permittee will conduct and submit the results of the forty-eight hour static renewal tests.

2. If toxicity is found in the permittee's effluent, the permittee shall, within 90 days of written notification by the Division, submit a Toxicity Reduction Evaluation (TRE) plan to the Division. The TRE plan shall detail the action the permittee will implement to eliminate toxicity. Within 270 days of Division approval of the TRE plan, the permittee shall complete implementation of the TRE plan and conduct follow-up biomonitoring of the effluent in accordance with the approved TRE plan. If toxicity is still indicated, the permittee shall continue the TRE plan. The TRE plan shall not be complete until the permittee has eliminated the toxicity in its effluent. On a case specific basis, chronic toxicity testing procedures may be required for the definitive determination that toxicity has been eliminated.

3. If toxicity is not indicated initially, or if there are substantial changes in the effluent composition, the permittee may be required to repeat the forty-eight hour static renewal test upon notification by the Division. On a case specific basis, chronic toxicity testing procedures may also be required.

Upon approval by the Division, all study plans and TRE plans will become part of the requirements of this permit.

APPENDIX E

Financial Assurance Documents

APPENDIX E

Financial Assurance Costs

APPENDIX E

Financial Assurance Documentation For Corrective Action and Liability Coverage For Groundwater and The Former Degreasing Unit (SWMU-49)

CORRECTIVE ACTION INSTALLATION COST ESTIMATE

WILLIAM L BONNELL COMPANY, INC.
NEWNAN, GEORGIA

ITEM	QUANTITY	UNIT COSTS	ITEM COST
1. RECOVERY WELLS			
a. Drilling	280 feet	$11.50 per hour	$3,220
b. Well Construction	280 feet	$27.00 per hour	$7,560
c. Pump Installation	7 each	$1,000.00 each	$7,000
2. VAPOR EXTRACTION WELLS			
a. Install vapor recovery system	Lump Sum	$10,000.00 each	$10,000.00
3. GROUNDWATER EXTRACTION PIPING SYSTEM			
a. Pipe Installation, 2-inch	1900 feet	$3.00 per l.f.	$5,700
b. Pipe Installation, 4-inch	1,800 feet	$4.75 per l.f.	$8,550
c. Pipe Installation, 6-inch	0 feet	$6.50 per l.f.	$0
d. Pump Station	2 each	$900.00 each	$1,800
e. Pumps & Equipment	2 each	$500.00 each	$1,000
4. TREATMENT	1 each	$5,000.00 each	$5,000
a. Equalization Tank	1 each	$3,000.00 each	$3,000
b. Pumps & Filters	2 each	$3,000.00 each	$6,000
c. Carbon Adsorption Tank	1 each	$4,000.00 each	$4,000
e. Vapor Extraction System	1 each	$20,000.00 each	$20,000
5. MISCELLANEOUS			
a. Electirical Transmission	1 each	$7,500.00 each	$7,500
b. Engineering	200 hours	$80.00 per hour	$16,000
c. Start-up	Lump Sum	$1,900.00 each	$1,900.00
		TOTAL COST	$108,000

* Includes labor cost
** All costs in 1993 dollars

CAPCONCC.WK1

CORRECTIVE ACTION OPERATION, MAINTENANCE, AND MONITORING COST ESTIMATE

WILLIAM L BONNELL COMPANY, INC.
NEWNAN, GEORGIA

ITEM	QUANTITY	UNIT COSTS	ITEM COST
1. MONITORING			
a. Influent/Effluent Monitoring of Groundwater	8 samples	$210.00 per sample	$1,680
b. Corrective Action Effectiveness, VOCs	12 wells	$390.00 per well	$4,680
c. Corrective Action Effectiveness, Chromium	1 wells	$30.00 per well	$30
2. OPERATION & MAINTENANCE			
a. Power	42500 kwh	$0.04 per kwh	$1,700
b. Inspection	100 hours	$40.00 per hour	$4,000
c. Parts & Supplies	Lump Sum	$1,500.00 each	$1,500.00
	TOTAL ANNUAL COST		$14,000
	TOTAL 20-YEAR COST		$280,000
3. ONE-YEAR VES TREATMENT SYSTEM COSTS			
a. Influent/Effluent Samples	24 samples	$62.50 per sample	$1,500
	TOTAL 0&M MONITORING COSTS		$282,000

* Includes labor cost

** All costs in 1993 dollars

CAPOM93.WK1

APPENDIX E
FINANCIAL ASSURANCE DOCUMENTATION FOR CORRECTIVE ACTION AND LIABILITY COVERAGE FOR GROUNDWATER AND THE FORMER DEGREASING UNIT (SWMU-49)

The William L Bonnell Company, Inc. (Bonnell) has selected the "corporate guarantee" as the method for demonstrating financial responsibility for corrective action for groundwater and the former Degreasing Unit (SWMU-49) at Bonnell's Newnan, Georgia facility. Bonnell has selected a combination of the corporate guarantee and a letter of credit to demonstrate financial responsibility for liability coverage, in accordance with 40 CFR §264.147(b)(6). Bonnell's guarantor is its corporate parent, Tredegar Industries, Inc. (Tredegar), a Virginia corporation. Because Tredegar is Bonnell's direct parent, Tredegar can satisfy the requirements of 40 CFR §§265.143(e)(10) (for corrective action), and 264.145(f)(11) and 264.147(g) (for liability coverage).

COST ESTIMATES

Appendix E provides a detailed written estimate, in current dollars, of the cost of groundwater corrective action in accordance with all applicable requirements. The estimate is based on the cost to Bonnell of hiring a third party to perform corrective action. The estimate does not incorporate any salvage value that may be realized from the sale of hazardous wastes, facility structures, equipment, land or other assets.

Appendix E provides a detailed written estimate, in current dollars, of the annual cost of monitoring and operation and maintenance of the groundwater corrective action program in accordance with all applicable requirements. The estimate is based on the cost to Bonnell of hiring a third party to conduct the activities. The cost estimate has been calculated by multiplying the annual cost estimate by the number of years of care required under 40 CFR §264.117.

LIABILITY COVERAGE

The following documentation reflects liability coverage in the amount of $4 million per occurrence and an $8 million annual aggregate for both sudden and non-sudden occurrences arising from operation of the Surface Impoundment Unit.

Tredegar
INDUSTRIES

CORPORATE GUARANTEE FOR CLOSURE AND POST-CLOSURE CARE

Guarantee made this March 23, 1993, by Tredegar Industries, Inc. ("Tredegar"), a business corporation organized under the laws of the State of Virginia, herein referred to as guarantor, to the Georgia Department of Natural Resources, Environmental Protection Division ("EPD"), obligee, on behalf of our subsidiary, The William L Bonnell Company, Inc. ("Bonnell"), of 25 Bonnell Street, Newnan, Georgia 30263.

RECITALS

1. Guarantor meets or exceeds the financial test criteria and agrees to comply with the reporting requirements for guarantors as specified in paragraph 391-3-11-.05 of the Rules of the Department of Natural Resources, Environmental Protection Division.

2. Bonnell owns or operates the following hazardous waste management facility covered by this guarantee:

Aluminum Extrusion Plant
Wastewater Treatment Facilities
25 Bonnell Street
Newnan, Georgia 30263
EPA ID#: GAD 003273224

Guarantee is for closure and post-closure care for selected hazardous waste treatment, storage or disposal units at the plant.

3. "Closure plans" and "post-closure plans" as used below refer to the plans maintained as required by paragraph 391-3-11-.05 for the closure and post-closure care of facilities as identified above.

4. For value received from Bonnell, guarantor guarantees to EPD that in the event that Bonnell fails to perform closure and post-closure care of the above facility in accordance with the closure or post-closure plans and other permit or interim status requirements whenever required to do so, the guarantor shall do so or establish a trust fund as specified in paragraph 391-3-11-.05 in the name of Bonnell in the amount of the current closure and/or post-closure cost estimates as specified in paragraph 391-3-11-.05.

5. Guarantor agrees that if, at the end of any fiscal year before termination of this guarantee, the guarantor fails to meet the financial test criteria, guarantor shall send within 90 days, by certified mail, notice to the EPD Director and to Bonnell that he intends to provide alternate financial assurance as specified in paragraph 391-3-11-.05 in the name of Bonnell. Within 120 days after the end of such fiscal year, the guarantor shall establish such financial assurance unless Bonnell has done so.

6. The guarantor agrees to notify the EPD Director by certified mail, of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming guarantor as debtor, within 10 days after commencement of the proceeding.

7. Guarantor agrees that within 30 days after being notified by the EPD Director of a determination that guarantor no longer meets the financial test criteria or that he is disallowed from continuing as a guarantor of closure and/or post-closure care, he shall establish alternate financial assurance as specified in paragraph 391-3-11-.05 in the name of Bonnell unless Bonnell has done so.

8. Guarantor agrees to remain bound under this guarantee notwithstanding any or all of the following: amendment or modification of the closure or post-closure plan, amendment or modification of the permit, the extension or reduction of the time of performance of closure or post-closure, or any other modification or alteration of an obligation of the owner or operator pursuant to paragraph 391-3-11-.05.

9. Guarantor agrees to remain bound under this guarantee for so long as Bonnell must comply with the applicable financial assurance requirements of paragraph 391-3-11-.05 for the above-listed facilities, except that guarantor may cancel this guarantee by sending notice by certified mail to the EPD Director and to Bonnell, such cancellation to become effective no earlier than 120 days after receipt of such notice by both EPD and Bonnell, as evidenced by the return receipts.

10. Guarantor agrees that if Bonnell fails to provide alternate financial assurances specified in paragraph 391-3-11-.05 and obtain written approval of such assurance from the EPD Director within 90 days after a notice of cancellation by the guarantor is received by the EPD Director from guarantor, guarantor shall provide such alternate financial assurance in the name of Bonnell.

11. Guarantor expressly waives notice of acceptance of this guarantee by the EPD or by Bonnell. Guarantor also expressly waives notice of amendments or modifications of the closure and/or post-closure plan and of amendments or modifications of the facility permit.

12. Any notice or other communication required by this guarantee shall be deemed sufficient if sent by certified U.S. Mail to the appropriate party at the following address:

Guarantor: Tredegar Industries, Inc.

Address: 1100 Boulders Parkway
Richmond, Virginia 23225
ATTN: Norman A. Scher
Chief Financial Officer

Owner or Operator: The William L Bonnell Company, Inc.

Address: 25 Bonnell Street
Newnan, Georgia 30263
ATTN: Leo F. Harlan

EPD Director: Harold F. Reheis, Director
Environmental Protection Division
Department of Natural Resources
205 Butler Street, S.E.
Atlanta, Georgia 30334

It shall be the responsibility of each party to notify the other parties in writing of any change to its address stated above.

I hereby certify that the wording of this guarantee is substantially the same as the wording specified in paragraph 391-3-11-.05 of the Rules of the Georgia Department of Natural Resources, Environmental Protection Division.

Effective date: MARCH 25, 1993

Tredegar Industries, Inc.

By: [signature]

Norman A. Scher
Its: Chief Financial Officer

Signature of witness or notary: F. Case Whittemore

Tredegar
INDUSTRIES

CORPORATE GUARANTEE FOR LIABILITY COVERAGE

Guarantee made this March 23, 1993, by Tredegar Industries, Inc. ("Tredegar"), a business corporation organized under the laws of the State of Virginia, herein referred to as guarantor, on behalf of our subsidiary, The William L Bonnell Company, Inc. ("Bonnell"), of 25 Bonnell Street, Newnan, Georgia 30263, to any and all third parties who have sustained or may sustain bodily injury or property damage caused by sudden and/or nonsudden accidental occurrences arising from operation of the facility covered by this guarantee.

RECITALS

1. Guarantor meets or exceeds the financial test criteria and agrees to comply with the reporting requirements for guarantors as specified in paragraph 391-3-11-.05 of the Rules of the Department of Natural Resources, Environmental Protection Division, and/or specified in 40 CFR 264.147(g) and 265.147(g).

2. Bonnell owns or operates the following hazardous waste management facility covered by this guarantee:

Aluminum Extrusion Plant
Wastewater Treatment Facilities
25 Bonnell Street
Newnan, Georgia 30263
EPA ID# GAD 003273224

This corporate guarantee satisfies RCRA and Georgia Hazardous Waste Management Act third-party liability requirements for both sudden and nonsudden accidental occurrences in above-named owner or operator facilities for coverage in the amount of $ 4,000,000 for each occurrence and $ 7,130,000 annual aggregate.

3. For value received from Bonnell, guarantor guarantees to any and all third parties who have sustained or may sustain bodily injury or property damage caused by sudden and/or nonsudden accidental occurrences arising from operations of the facility covered by this guarantee that in the event that Bonnell fails to satisfy a judgment or award based on a determination of liability for bodily injury or property damage to third parties caused by sudden and/or nonsudden accidental occurrences, arising from the operation of the above-named facility, or fails to pay an amount agreed to in settlement of a claim arising from or alleged to arise from such injury or damage, the guarantor will

satisfy such judgment(s), award(s) or settlement agreement(s) up to the limits of coverage identified above.

4. Such obligation does not apply to any of the following:

(a) Bodily injury or property damage for which Bonnell is obligated to pay damages by reason of the assumption of liability in a contract or agreement. This exclusion does not apply to liability for damages that Bonnell would be obligated to pay in the absence of the contract or agreement.

(b) Any obligation of Bonnell under a workers' compensation, disability benefits, or unemployment compensation law or any similar law.

(c) Bodily injury to:

(1) An employee of Bonnell arising from, and in the course of, employment by Bonnell; or

(2) The spouse, child, parent, brother or sister of that employee as a consequence of, or arising from, and in the course of employment by Bonnell.

This exclusion applies:

(A) Whether Bonnell may be liable as an employer or in any other capacity; and

(B) To any obligation to share damages with or repay another person who must pay damages because of the injury to persons identified in paragraphs (1) and (2).

(d) Bodily injury or property damage arising out of the ownership, maintenance, use, or entrustment to others of any aircraft, motor vehicle or watercraft.

(e) Property damage to:

(1) Any property owned, rented, or occupied by Bonnell;

(2) Premises that are sold, given away or abandoned by Bonnell if the property damage arises out of any part of those premises;

(3) Property loaned to Bonnell;

(4) Personal property in the care, custody or control of Bonnell;

(5) That particular part of real property on which Bonnell or any contractors or subcontractors working directly or indirectly on behalf of Bonnell are performing operations, if the property damage arises out of these operations.

5. Guarantor agrees that if, at the end of any fiscal year before termination of this guarantee, the guarantor fails to meet the financial test criteria, guarantor shall send within 90 days, by certified mail, notice to the EPD Director and to Bonnell that he intends to provide alternate liability coverage as specified in paragraph 391-3-11-.05 in the name of Bonnell. Within 120 days after the end of such fiscal year, the guarantor shall establish such liability coverage unless Bonnell has done so.

6. The guarantor agrees to notify the EPD Director, by certified mail of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming guarantor as debtor, within 10 days after commencement of the proceeding.

7. Guarantor agrees that within 30 days after being notified by the EPD Director of a determination that guarantor no longer meets the financial test criteria or that he is disallowed from continuing as a guarantor, he shall establish alternate liability coverage as specified in paragraph 391-3-11-.05 in the name of Bonnell, unless Bonnell has done so.

8. Guarantor reserves the right to modify this agreement to take into account amendment or modification of the liability requirements set by paragraph 391-3-11-.05, provided that such modification shall become effective only if the EPD Director does not disapprove the modification within 30 days of receipt of notification of the modification.

9. Guarantor agrees to remain bound under this guarantee for so long as Bonnell must comply with the applicable requirements of paragraph 391-3-11-.05 for the above-listed facility, except as provided in paragraph 10 of this agreement.

10. Guarantor may terminate this guarantee by sending notice by certified mail to the EPD Director and to Bonnell, provided that this guarantee may not be terminated unless and until Bonnell obtains, and the EPD Director approves, alternate liability coverage complying with paragraph 391-3-11-.05.

11. This guarantee is to be interpreted and enforced in accordance with the laws of Virginia.

12. Guarantor hereby expressly waives notice of acceptance of this guarantee by any party.

13. Guarantor agrees that this guarantee is in addition to and does not affect any other responsibility or liability of the guarantor with respect to the covered facilities.

14. The Guarantor shall satisfy a third party liability claim only on receipt of one of the following documents:

(a) Certification from the Principal [Bonnell] and the third party claimant(s) that the liability claim should be paid. The certification must be worded as follows, except that instructions in brackets are to be replaced with the relevant information and the brackets deleted:

CERTIFICATION OF VALID CLAIM

The undersigned, as parties The William L Bonnell Company, Inc. (Bonnell) and [insert name and address of third party claimant(s)], hereby certify that the claim of bodily injury and/or property damage caused by a [sudden or nonsudden] accidental occurrence arising from operating Bonnell's hazardous waste treatment, storage, or disposal facility should be paid in the amount of $[ ].

By:________________________
Norman A. Scher
Chief Financial Officer,
Tredegar Industries, Inc.

(Notary) Date

[Signatures]
Claimant(s)

(Notary) Date

(b) A valid final court order establishing a judgment against the Principal for bodily injury or property damage caused by sudden or nonsudden accidental occurrences arising from the operation of the Principal's facility or group of facilities.

In the event of combination of this guarantee with another mechanism to meet liability requirements, this guarantee will be considered excess coverage.

I hereby certify that the wording of this guarantee is substantially the same as the wording specified in paragraph 391-3-11-.05 of the Rules of the Georgia Department of Natural Resources, Environmental Protection Division, and/or 40 C.F.R. 254.151(h)(2), as applicable.

Effective date: MARCH 25, 1993

Tredegar Industries, Inc.

By: N A Scher

Norman A. Scher
Its: Chief Financial Officer

Signature of witness or notary: F. Case Whittemore

Tredegar
INDUSTRIES

March 23, 1993

Harold F. Reheis, Director
Environmental Protection Division
Department of Natural Resources
205 Butler Street, S.E.
Atlanta, Georgia 30334

LETTER FROM CHIEF FINANCIAL OFFICER

Dear Sir:

I am the chief financial officer of Tredegar Industries, Inc. ("Tredegar"), 1100 Boulders Parkway, Richmond, Virginia 23225. This letter is in support of the use of the financial test to demonstrate financial responsibility for liability coverage and closure and post-closure care as specified in paragraph 391-3-11-.05 of the Rules of the Department of Natural Resources, Environmental Protection Division.

The firm identified above is the owner or operator of the following facilities for which liability coverage for both sudden and nonsudden accidental occurrences is being demonstrated through the financial test specified in paragraph 391-3-11-.05, and/or Subpart H of 40 CFR Parts 264 and 265: NONE.

The firm identified above guarantees, through the corporate guarantee specified in paragraph 391-3-11-.05 and/or Subpart H of 40 CFR Parts 264 and 265, liability coverage for both sudden and nonsudden accidental occurrences at the following facilities owned or operated by the following subsidiaries of the firm: The William L Bonnell Company, Inc., Newnan, Georgia (GAD 003273224).

1. The firm identified above (Tredegar) owns or operates the following facilities which are located in the State of Georgia and for which financial assurance for closure and/or post-closure care is demonstrated through the financial test specified in paragraph 391-3-11-.05. The current closure and/or post-closure cost estimate covered by the test are shown for each facility: NONE.

2. The firm identified above guarantees, through the corporate guarantee specified in paragraph 391-3-11-.05, the

closure and/or post-closure care of the following facilities which are located in the State of Georgia and which are owned or operated by its subsidiaries. The current cost estimates for the closure and post-closure care so guaranteed are shown for each facility:

	Closure/Post-Closure Cost Estimate
The William L Bonnell Company, Inc. Newnan, Georgia GAD 003273224	$3,239,000

3. In States outside of Georgia, where EPA or some designated authority is administering financial responsibility requirements, this firm is demonstrating financial assurance for the closure and/or post-closure care of the following facilities through the financial test or corporate guarantee specified in Subpart H of 40 CFR Parts 264 and 265 or through a test which is equivalent or substantially equivalent to it. The current closure and/or post-closure cost estimates covered by such a test or guarantee are shown for each facility: NONE.

4. The firm identified above owns or operates the following hazardous waste management facilities for which financial assurance for closure and, if a disposal facility, post-closure care, is not demonstrated either to EPA or a State through the financial test or any other financial assurance mechanism specified in Subpart H of 40 CFR Parts 264 and 265 or equivalent or substantially equivalent State mechanisms. The current closure and/or post-closure cost estimates not covered by such financial assurance are shown for each facility: NONE.

5. This firm (Tredegar) is the owner or operator of the following UIC facilities for which financial assurance for plugging and abandonment is required under 40 CFR Part 144. The current closure cost estimates as required by 40 CFR 144.62 are shown for each facility: NONE.

The total of the current cost estimates for closure and/or post-closure care, listed in the five numbered paragraphs above, is $3,239,000. To the best of my knowledge, this figure is sufficient to execute the closure plans and to perform post-closure care responsibilities for all the facilities listed in paragraphs 1. through 5. above.

This firm is required to file a Form 10K with the Securities and Exchange Commission (SEC) for the latest fiscal year.

The fiscal year of this firm ends on December 31. The figures for the following items marked with an asterisk are derived from this firm's independently audited, year-end financial statements for the latest completed fiscal year, ended December 31, 1992.

Closure/Post-Closure Care and Liability Coverage ($ in Thousands)

Alternative I

1.	Sum of current closure and post-closure cost estimates (total of <u>all</u> cost estimates shown in the five numbered paragraphs above).	$ 3,239
2.	Amount of annual aggregate liability coverage to be demonstrated.	$ 7,130
3.	Sum of lines 1 and 2.	$ 10,369
*4.	Total liabilities (if any portion of your closure or post-closure cost estimates is included in your total liabilities, you may deduct that portion from this line and add that amount to lines 5 and 6).	$196,668
*5.	Tangible net worth.	$117,820
*6.	Net worth	$162,397
*7.	Current assets . .	$124,691
*8.	Current liabilities	$ 62,472
9.	Net working capital (line 7 minus line 8).	$ 62,219
*10.	The sum of net income plus depreciation, depletion, and amortization.	$ 39,180
*11.	Total assets in U.S. (required only if less than 90% of assets are located in the U.S.).	$ N/A

		Yes	No
12.	Is line 5 at least $10 million?	X	
13.	Is line 5 at least 6 times line 3?	X	
14.	Is line 9 at least 6 times line 3?	X	
*15.	Are at least 90% of assets located in the U.S.? If not, complete line 16.	X	
16.	Is line 11 at least 6 times line 3?	N/A	
17.	Is line 4 divided by line 6 less than 2.0?	X	
18.	Is line 10 divided by line 4 greater than 0.1?	X	
19.	Is line 7 divided by line 8 greater than 1.5?	X	

I hereby certify that the wording of this letter is substantially the same as the wording specified in paragraph 391-3-11-.05 of the Rules of the Georgia Department of Natural Resources, Environmental Protection Division.

Tredegar Industries, Inc.

By: N A Scher

Norman A. Scher
Its: Chief Financial Officer

Date: MARCH 23, 1993

Coopers
&Lybrand

certified public accountants

March 23, 1993

Tredegar Industries, Inc.
1100 Boulders Parkway
Richmond, Virginia 23225

Dear Sirs:

We have audited the consolidated financial statements of Tredegar Industries, Inc. and Subsidiaries (the "Company") as of December 31, 1992 and for the year then ended and have issued our report thereon dated January 29, 1993 (except for the information presented in Note 6 to the financial statements, for which the date is February 10, 1993). These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards. These standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

Subsequent to our audit, which was made for the purpose of enabling us to express an opinion on the aforementioned financial statements, we reviewed the letter dated March 23, 1993 submitted by Mr. Norman A. Scher, Chief Financial Officer of Tredegar Industries, Inc., to the Director, Environmental Protection Division, Georgia Department of Natural Resources, whose administering functions are similar to those required by regulation 40 CFR Parts 264 and 265, and compared the financial information specified as having been derived from the aforementioned financial statements for the year ended December 31, 1992 to these financial statements. In connection with this procedure, we obtained no knowledge of any matter that would require that the specified financial information be adjusted.

This letter is solely for the information of, and assistance to, state regulatory agencies in conducting their investigation of the affairs of the Company in connection with regulations similar to 40 CFR Parts 264 and 265 and is not to be used, circulated, quoted, or otherwise referred to, for any other purposes.

Very truly yours,

Coopers & Lybrand

Signet Bank/Virginia
International Division
P.O. Box 25339
Richmond, Virginia 23260

Harold F. Reheis, Director
Environmental Protection Division
Georgia Department of Natural Resources
205 Butler Street, S.E., Suite 1154
Atlanta, Georgia 30334

Dear Sir:

We hereby establish our Irrevocable Standby Letter of Credit No. S-63003 in the favor of any and all third-party liability claimants, at the request and for the account of The William L Bonnell Company, Inc. (Bonnell), of 25 Bonnell Street, Newnan, Georgia, for third-party liability awards or settlements up to seven hundred thousand U.S. dollars $ 700,000 per occurrence and the annual aggregate amount of seven hundred thousand U.S. dollars $ 700,000, for *sudden* accidental occurrences and/or for third-party liability awards or settlements up to the amount of NO U.S. dollars $ 0 per occurrence, and the annual aggregate amount of NO U.S. dollars $ 0 , for *nonsudden* accidental occurrences available upon presentation of a sight draft, bearing reference to this letter of credit No. S-63003, and:

(1) a signed certificate reading as follows:

CERTIFICATION OF VALID CLAIM

The undersigned, as parties, The William L Bonnell Company, Inc. (Bonnell) and [insert name and address of third-party claimants], hereby certify that the claim of bodily injury [and/or] property damage caused by a sudden accidental occurrence arising from operations of Bonnell's hazardous waste treatment, storage, or disposal facility should be paid in the amount of $____________. We hereby certify that the claim does not apply to any of the following:

(a) Bodily injury or property damage for which Bonnell is obligated to pay damages by reason of the assumption of liability in a contract or agreement. This exclusion does not apply to liability for damages that Bonnell would be obligated to pay in the absence of the contract or agreement.

(b) Any obligation of Bonnell under a worker's compensation, disability benefits, or unemployment compensation law or any similar law.

(c) Bodily injury to:

(1) An employee of Bonnell arising from, and in the course of, employment by Bonnell; or

(2) The spouse, child, parent, brother or sister of that employee as a consequence of, or arising from and in the course of, employment by Bonnell.

This exclusion applies:

(A) Whether Bonnell may be liable as an employer or in any other capacity; and

(B) To any obligation to share damages with or repay another person who must pay damages because of the injury to persons identified in paragraphs (1) and (2).

(d) Bodily injury or property damage arising out of the ownership, maintenance, use, or entrustment to others of any aircraft, motor vehicle or watercraft.

(e) Property damage to:

(1) Any property owned, rented, or occupied by Bonnell;

(2) Premises that are sold, given away or abandoned by Bonnell if the property damage arises out of any part of those premises;

(3) Property loaned to Bonnell;

(4) Personal property in the care, custody or control of Bonnell;

(5) That particular part of real property on which Bonnell or any contractors or subcontractors working directly or indirectly on behalf of Bonnell are performing operations, if the property damage arises out of these operations.

[Signatures]
Norman A. Scher
Tredegar Industries, Inc.

[Signatures]
Claimant(s)

or (2) a valid final court order establishing a judgment against Bonnell for bodily injury or property damage caused by a sudden or nonsudden accidental occurrence arising from operation of Bonnell's facility or group of facilities.

This letter of credit is effective as of September 15, 1992, and shall expire on September 15, 1993, but such expiration date shall be automatically extended for a period of one year on September 15, 1993, and on each successive expiration date, unless, at least 120 days before the current expiration date, we notify you, The Environmental Protection Division, Georgia Department of Natural Resources, and Bonnell by certified mail that we have decided not to extend this letter of credit beyond the current expiration date.

Whenever this letter of credit is drawn on under and in compliance with the terms of this credit, we shall duly honor such draft upon presentation to us.

In the event that this letter of credit is used in combination with another mechanism for liability coverage, this letter of credit shall be considered "excess" coverage.

We certify that the wording of this letter of credit is identical to the wording specified in 40 C.F.R. 264.151(k), as such regulations were constituted on the date shown immediately below.

____
Signature of official of issuing institution

Vice President
Title

9/10/92
Date

~~This credit is subject to the provisions of the Uniform Customs and Practice for~~ Documentary Credits, 1983 revision, ICC Publication #400, published by the International Chamber of Commerce and, to the extent, not inconsistent therewith, the provisions of the Virginia Uniform Commercial Code.

Signet Bank/Virginia
International Division
7 North Eighth Street
PO Box 25339
Richmond Virginia 23260
Swift Address BOVA US 33
Chip UID Number 060113

AMENDMENT TO STANDBY LETTER OF CREDIT

SIGNET L/C #: S-63003
LC ISSUED: 9/15/92

AMENDMENT DATE: 22 MAR 1993

APPLICANT:
THE WILLIAM L BONNELL COMPANY,
INC. (BONNELL)
25 BONNELL STREET
NEWNAN, GEORGIA 30264

BENEFICIARY:
HAROLD F REHEIS, DIRECTOR, ENVIRONMENTAL PROTECTION DIVISION, GEORGIA DEPT OF NATURAL RESOURCES, 205 BUTLER ST SE #1154, ATLANTA GA 30334

THE ABOVE MENTIONED LETTER OF CREDIT IS HEREBY AMENDED AS FOLLOWS:

AMOUNT INCREASED BY: USD ***170,000.00

WRITTEN AMENDMENT AMOUNT: ONE HUNDRED SEVENTY THOUSAND AND 00/100 UNITED STATES DOLLARS

AGGREGATE AMOUNT OF LETTER OF CREDIT NOW TO READ USD 870,000.00 (EIGHT HUNDRED SEVENTY THOUSAND AND 00/100 UNITED STATES DOLLARS)

THIS AMENDMENT IS TO BE CONSIDERED AS PART OF THE ABOVE MENTIONED CREDIT AND MUST BE ATTACHED THERETO. ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED.

AUTHORIZED SIGNATURE(S)

Elias M. Shomali
Senior Vice President

AUTHORIZED SIGNATURE(S)

Teresa E. Burns
International Banking Officer

PCE DEGREASER CORRECTIVE ACTION PLAN AND VAPOR EXTRACTION SYSTEM DESIGN REPORT

Prepared for

THE WILLIAM L BONNELL COMPANY, INC.
25 Bonnell Street
Newnan, Georgia 30264

November 1994

Prepared by

EMCON Southeast
1560 Oakbrook Drive
Suite 100
Norcross, Georgia 30393

EMCON Project Number 2040.007.92

PCE DEGREASER CORRECTIVE ACTION PLAN
AND VAPOR EXTRACTION SYSTEM DESIGN REPORT

Prepared for

THE WILLIAM L BONNELL COMPANY, INC.
25 Bonnell Street
Newnan, Georgia 30264

EMCON Project Number 2040.007.92

I certify that I am a qualified groundwater scientist who has received a baccalaureate or post-graduate degree in the natural sciences or engineering, and have sufficient training and experience in groundwater hydrology and related fields, as demonstrated by state registration and completion of accredited university courses, that enable me to make sound professional judgements regarding groundwater monitoring and contaminant fate and transport. I further certify that this report was prepared by myself or by a subordinate working under my direction.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

11/9/99

David S. Buchalter, P.E. | Date
Group Manager
Environmental Services

GEORGIA
REGISTERED
No. [illegible]
PROFESSIONAL
ENGINEER
DAVID S. BUCHALTER

PCE DEGREASER CORRECTIVE ACTION PLAN AND VAPOR EXTRACTION SYSTEM DESIGN REPORT

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SECTION 1
INTRODUCTION

1.1 BACKGROUND

This report summarizes EMCON's activities relating to the Stage II investigation of the former PCE/TCE degreaser at The William L Bonnell Company, Inc.'s aluminum extrusion plant in Newnan, Georgia (Figure 1). This work was performed between July and November 1993 as an interim corrective action measure as described in the approved Corrective Action Plan (CAP).

The Stage I investigation report by EMCON (dated January 1993) described the specific location of the degreaser referred to in the Georgia Department of Environmental Protection (EPD) RCRA Facility Assessment (RFA) as Solid Waste Management Unit-49 (SWMU-49). The unit's location was determined based on engineering plans of the Bonnell site prepared in 1957, and by the use of a multi-level soil vapor survey.

1.2 PURPOSE

The purpose of this investigation was to: (1) accurately determine, locate and orient the former degreaser; (2) determine if any buried tanks or sumps were present; (3) determine if Dense Nonaqueous Phase Liquids (DNAPLs) were present below and adjacent to the unit; (4) a plan for a more permanent vapor extraction system (VES) based on the field data; (5) propose shutdown criteria for the VES operation; and (6) prepare a soil sampling verification plan.

1.3 INVESTIGATION PROCEDURES

The investigation of the former PCE degreaser was accomplished using soil gas probes, installing vapor extraction wells (VEWs), performing vapor extraction testing, excavating soils, profiling soils with a photoionization detector (PID), and sampling soils.

Four VEWs were installed around the former degreasing unit as shown on Figure 3. These wells were used to extract PCE vapors before excavating for two reasons: first, to remove as much of the volatile mass as possible before excavating for health and safety considerations; and second, to determine the rate and distance of vacuum influence before and after excavation.

The excavation was performed in a contained area enclosed from floor to roof with sealed plastic sheeting. A backhoe and forklift were positioned inside the containment with exhaust piping plumbed through the roof. A detailed health and safety plan was implemented throughout the investigation. Following the excavation, two additional VEWs were installed in the excavation pit prior to backfilling with sand and soil. Vapor extraction testing and remediation resumed after a new concrete floor was poured.

SECTION 2
METHODOLOGY

2.1 VAPOR EXTRACTION WELL INSTALLATION

Vapor extraction wells VEW-1, VEW-2, VEW-3, and VEW-4 were installed in July 1993 (Figure 3). After coring a 10-inch diameter hole in the 6-inch thick concrete floor, a 3.75-inch outer diameter (O.D.) stainless steel hand auger was used to bore a hole to a depth of 13 feet below the existing floor surface. This depth was chosen based on the known depth to groundwater of 16 feet at nearby monitoring well 40-D and the resistance to hand augering due to the weathered gneissic bedrock which occurs at 13 feet. The soils between the surface and 13 feet were sandy clay, reddish-brown, dense, and dry with a moderate odor of PCE.

VEW-1 was installed at previous soil gas probe location GP-7 where the highest concentration of vapors (1,074 ppm) was identified during the Stage I investigation. VEW-2 was installed at previous soil gas probe location GP-18, VEW-3 at previous soil gas probe location GP-8, and VEW-4 near previous soil gas probe location GP-4. These four VEWs surround the old degreaser area and allowed for well testing and mass removal of vapors prior to exploratory excavation. VEW-5 and VEW-6 were installed in the excavation prior to backfilling.

Each well was constructed of 2-inch O.D. Schedule 40 PVC flush-threaded and factory slotted (0.020-inch slot width) well casing. The six VEWs were screened from 3 to 13 feet below ground surface (BGS) and well casings extend from the surface to the top of the screen (3 feet BGS). A Portland cement and bentonite slurry was used to seal the annulus from 3 feet to the surface after backfilling the annulus of the wells with soils removed during augering. Each well was protected at the surface with a clearly labelled traffic-rated and water-tight locking box. Details of the well construction and surface seals are presented in Section 4.3 of this report (Engineering Plans and VES Shutdown Criteria).

2.2 VAPOR EXTRACTION TESTING

Several vapor extraction tests (VETs) were performed between August and October 1993 using single and multiple well combinations. These tests are summarized in Tables 2, 3, and 4. The VETs were accomplished using EMCON's two-horsepower (HP) explosion-proof test unit. The well fittings and couplings were constructed of Schedule 40 PVC, polyethylene cam-lock type fittings and flexible two-inch vacuum rated clear suction hose.

Extracted vapors were pushed through two 160-pound vapor phase carbon canisters connected in series. A vapor sampling port was placed in line before the first carbon drum and another between the first and second drums. These sampling ports were used to determine inlet vapor concentrations for mass removal calculations as well as to determine the breakthrough status of the carbon filtration units.

The vacuum radius of influence was measured at the surrounding VEWs, at monitoring well 40-D and at two temporary probe locations (P-1 and P-2 on Figure 3). Measurements of increasing and decreasing vacuum were made by using calibrated multi-range magnahelic gauges attached to the wells and probes.

The vapor concentrations were measured with a PID equipped with a 10.6 electron volt (EV) bulb and calibrated to a toluene gas standard. Toluene was selected because its ionization potential of 8.82 EV is near that of PCE (ionization potential 9.32 EV). This method allowed for an instrument response similar to PCE without using a hazardous calibration gas.

2.3 EXCAVATION METHODS

Excavation of the former degreaser was performed to determine how the unit was constructed and whether any DNAPL could be found. The excavation of the former degreaser area was a complex operation due to the location (inside the building in an area of much activity), the need for heavy equipment, and the potential for exposure to PCE and TCE vapors. For these reasons extensive planning and engineering controls were used to provide containment of fugitive vapors and a safe work area.

EMCON and Payton Construction personnel who worked in the confined space were all 40-hour OSHA trained for hazardous waste operations. The confined work area was constructed by Bonnell at EMCON's direction. The primary elements of the containment were the plastic sheeting and plumbing for the backhoe exhaust plus the use of the EMCON vapor extraction system placed outside of the enclosure and plumbed through the sheeting. The VES was used to provide a constant vacuum (negative pressure) inside of the containment while purifying the air removed from the inside work area.

During the excavation activities ambient air concentrations were monitored continuously using both the PID and a Gastech Model 1314 digital explosimeter type of combustible gas indicator (CGI). The CGI was used to monitor the lower explosive limit and the level of oxygen inside the contained area. Half-face respirators with organic vapor cartridges were required during excavation activities when the PID reading exceeded 20 ppm in the breathing zone. Typically, personnel respirators were worn as soon as the odor of PCE was smelled (approximately 3 ppm). When vapor concentrations in the breathing zone approached 60 ppm on the PID, work was stopped until engineering controls reduced concentrations to less than 20 ppm.

Due to potential impacts of the noise and vibration associated with the excavation work, activities were carried out at night and on weekends. A concrete saw was used to cut through the concrete floor around the perimeter of the area to be excavated (Figure 4). A combination of a hand operated jack hammer and a backhoe mounted air ram were used to facilitate removal of the surficial concrete.

2.4 SOIL HEADSPACE SAMPLING WITH PID

During the excavation of soils below the former PCE/TCE degreasing unit, PID readings were made at various depths in each corner and midway along the walls of the excavation (Figure 5). PID readings were made just below the floor on which the degreaser stood (approximately seven feet below the existing plant floor) and at depths of ten feet and thirteen feet (base of excavation).

PID headspace readings were made by filling eight-ounce soil sample jars half-way with excavated soil and sealing with an air-tight teflon-lined cap prior to agitation by shaking. After the sample was shaken for approximately fifteen seconds, it was allowed to sit for five minutes to equilibrate. The PID probe was then inserted into the jar and the peak concentration recorded for each depth at each location.

2.5 SLUDGE SAMPLING AND ANALYSIS

Sludge sampling was carried out to identify the concentrations of PCE and TCE and their volume ratio. Prior to excavation it was unknown if a tank or sump with sludge was present in the former degreasing unit. Although no such tank or sump was found, a small piece of six-inch diameter steel pipe was found below the floor where the degreaser tank was originally set (Figure 5).

The pipe encountered below the concrete floor was found to be sealed with concrete at one end and only extended approximately six inches out from the concrete plug. A small amount (approximately eight ounces) of oily sludge with metal shavings was observed in the broken end of the pipe. The PID readings confirmed that high levels (1,470 ppm) of volatiles were present in the sludge.

All of the visible sludge was compacted into one precleaned eight-ounce sample jar using a stainless steel spoon and nitrile safety gloves. The jar was sealed with a teflon-lined cap, labelled and placed into an ice-filled cooler. After filling out the appropriate chain-of-custody documentation, the sample was delivered to ASI analytical laboratory in Atlanta, Georgia. The sludge was analyzed for volatiles by EPA test method 8260.

SECTION 3

FIELD INVESTIGATION RESULTS AND LABORATORY RESULTS

3.1 EXCAVATION OF FORMER ANODIZING PIT

After removing the concrete floor, an approximately three-foot thick layer of clean dry sand was removed with a backhoe bucket until cement obstructions (piers) were encountered between three and four feet. These piers were on the floor of the former anodizing pit which existed above the old degreaser and was used after the degreaser had been decommissioned in the late 1950s. The sand had been used as fill material when the anodizing pit was closed in the 1960s. During the Stage I investigation, the sand was found to contain less than 10 ppm volatile vapors on the PID, even though outside the former anodizing pit one foot away, concentrations greater than 1,000 ppm were measured. These data indicate that the anodizing pit was well sealed to vapor migration.

The bottom foot of sand between the piers was removed using shovels to expose the floor of the former anodizing pit. A jackhammer and air ram were then used to break through the steel reinforced concrete piers to access the floor of the former degreasing unit below.

3.2 EXCAVATION OF FORMER DEGREASER FLOOR AND SUBSURFACE SOILS

After breaking and removing concrete which formed the base of the former anodizing pit, another concrete floor was found, the limits of which are shown on Figures 3 and 4 as the limits of the former degreasing area. This concrete floor was removed from the base of the anodizing pit. PID readings indicated elevated organic vapor concentrations below the concrete floor.

All personnel working inside the confined area were wearing breathing protection devices and were monitored continuously for exposure. Half-face air purifying respirators with combination cartridges (dust and organic vapors) were used. Continuous air monitoring using the PID and CGI was performed in the breathing zone of each worker as well as inside and outside of the containment area.

As noted above, after removing the concrete floor of the former degreaser with the jackhammer and air ram, a small section of steel pipe was found at the location shown on Figure 5 and a sludge sample was collected. This pipe was found to be attached to a concrete filled pipe which was pointed upward. It is assumed that this piping was related to a sub-floor drain used to recirculate the solvent.

Plant personnel who were present during the original operations of the degreaser stated that the location of the pipe was where the PCE tank formerly sat on top of the concrete slab. A flexible rubber pipe was also found buried in the vicinity of the steel pipe but nothing was found in it and the PID indicated no vapors inside. The rubber pipe appeared to be part of an old drain which led to the nearby 36-inch primary concrete drain pipe (see Figure 5 for location).

Soil was inspected visually and with the PID in the vicinity of buried pipe. No staining or liquid solvent was visible in the soil. A headspace sample from soils collected just below the pipe registered 460 parts per million (ppm). The distribution of soil PID readings during excavation is shown on Figure 5.

The excavation was deepened to a total depth of 13 feet below the existing plant floor. Soils below the concrete slab were reddish brown, dense, silty to sandy clays with small angular to subrounded pebbles. At 12.5 feet the soils graded into black and white weathered biotite gneiss bedrock. No evidence was found to indicate that these soils had been previously disturbed, and no subsurface obstructions were encountered.

Soil vapor concentrations were monitored on the PID and found to decrease significantly with depth at all locations within the excavation pit (Figure 5). When the soils were broken up during excavation volatile vapors were released. The vapor concentrations decreased rapidly as the soils were stored in piles inside the confined area.

After confirming that no significant DNAPL sources existed in the subsurface area of the former degreaser, the excavation was backfilled with the previously removed sand. Two vapor extraction wells (VEW-5 and VEW-6 on Figures 4 and 5) were installed into the backfill during placement. The excavated soils were backfilled around the well casings and screens in the former anodizing pit to create a high permeability vapor extraction chamber. After compacting the soils with a portable tamper, the new concrete floor was poured with protective well boxes over VEW-5 and VEW-6.

3.3 RESULTS OF VAPOR EXTRACTION TESTING

Soil vapor extraction (SVE) was performed in the area of the former PCE/TCE degreasing unit to induce soil gases to flow to the six VEWs installed in the unsaturated zone. The application of vacuum to the wells and the induced gas flow results in the evaporation of nonaqueous phase liquids (NAPLs) and the volatilization of solvents dissolved in residual pore water. Additionally, SVE has been shown to cause the desorption of chemicals from the soil surfaces (Falta, et al., 1993).

The SVE method was chosen to remove the PCE/TCE contaminants from the contaminated soils due to their location adjacent to and below a building that is being used. Soil samples collected during installation of soil gas probes GP-7, GP-8, GP-17, and GP-18 before starting the SVE system (EMCON, Stage I Investigation) indicated that PCE concentrations in the soil ranged from 29 to 180 micrograms per kilogram (μg/kg), with lesser amounts of TCE (Table 1).

3.3.1 VES Radius of Influence

EMCON measured the effective radius of influence induced by the 2 HP GAST blower at VEW-1 both before and after excavation.. VEW-1 was chosen based on the available soil gas data from the Stage I Investigation. As evident on Figure 2, location GP-7 (VEW-1) was very near the center of the vapor plume. The radius of influence observed (before the excavation) during the test of VEW-1 is shown on Figure 6. The radius of influence of VEW-1 after the excavation is shown on Figure 7.

After completing the excavation, new well VEW-5 was used to extract soil vapors from a location closer to the old degreaser and to take advantage of the higher permeability sand backfill placed in the bottom of the excavation. The effective radius of vacuum influence while extracting from VEW-5 is shown on Figure 8.

3.3.2 Mass Removal Estimates

The key issues with regard to the performance of the SVE system are the rate of mass removal from the soil and the length of time required to meet specific soil cleanup targets. The rate of mass removal by the SVE system depends on the vapor concentrations in the extracted air and the rate of air flow.

Several factors can affect the soil gas concentrations and air flow characteristics. Chemical concentrations are affected by mass transfer from the soil and soil water to the vapor phase by evaporation and desorption. The rate and pattern of airflow depends on the intrinsic permeability of the soil to air and the vacuum applied to the extraction well.

At the Bonnell site, the permeability of the soil to air was nearly doubled by excavation, mixing with sand with placement of VEWs in the backfill. The location of the contaminated zone in a covered area with no surface moisture allowed the SVE to evaporate contaminated pore water in the affected area around SWMU-49 and within the radius of SVE influence.

The basic equation used to estimate the mass of PCE removed in pounds per hour is as follows:

$$MR = (C \times ppmV \times CFM)/R_g$$

Where: MR = Mass Removed in lb/hr;

C = a conversion constant,

$((60\ min/hr)/(1 \times 10^{-6})(379\ ft^3/lb\text{-}mole)$

ppmV = parts per million by volume;

CFM = Cubic Feet per Minute; and

R_g = ideal gas constant = 379 ft^3/lb-mole

In the period of SVE operation beginning on August 2, 1993, and ending November 2, 1993, (first quarter of operation) a total mass of 233 pounds (21.4 equivalent gallons) of PCE were removed. A total of approximately 290 pounds (26.5 equivalent gallons) of PCE have been removed during the period between August 2, 1993, and November 1, 1994. During this three month period, the SVE system was offline for 30 days for a warranty service repair.

Graphs showing the vapor concentration versus time for extraction from VEW-1 and VEW-5 are shown on Figures 9, 10, and 10A, respectively. This data is tabulated in Tables 2, 4, and 4A.

3.4 PCE/TCE SLUDGE SAMPLING RESULTS

The sludge sample collected on September 13, 1993, from the buried pipe was delivered to ASI Laboratories in Atlanta, Georgia to be analyzed for volatiles by EPA Test Method 8260. Results of the analytical testing indicated a PCE concentration of 25,000 milligrams per kilogram (mg/kg) and a TCE concentration of 1900 mg/kg.

The ratio of TCE to PCE in the sludge was 7.6 percent. Discussions with current and former employees of Bonnell have indicated that only PCE was used in the former degreaser at SWMU-49. The 7.6 percent ratio is most likely representative of the level of TCE impurity common in PCE solvent. A copy of the certified analytical results for the sludge sample is included with the chain-of-custody documentation in Appendix A.

SECTION 4

CONCLUSIONS AND RECOMMENDATIONS

4.1 DISCUSSION OF RESULTS

The results of the SVE operations and exploratory excavation in the area of the former PCE degreaser (SWMU-49) have been encouraging. A significant volume of PCE vapors were removed prior to excavation. No significant sources of solvent or sludge were found below the former degreasing area during the excavation and the level of soil contamination was found to decrease with depth.

Contaminated soils which were excavated were aerated in the contained area and backfilled into the pit in a mixture with high permeability sand. The central placement of two VEWs in the pit increased the air flow rate through the affected soils about 65 percent and provided a large negative pressure area for surrounding vapors to migrate into.

Concentrations of extracted vapors decreased from 557 ppm to 1 ppm between August 2, 1993, and September 19, 1994 (Figures 9, 10, and 10A).

4.2 RECOMMENDATIONS

EMCON recommends that Bonnell continue to operate a VES in the area of the former PCE degreaser area (SWMU-49). The following sections describe the engineering plans, the VES shutdown criteria and the associated verification soil sampling.

The cleanup targets for PCE and TCE contaminated soils required by the regulatory agency for this site are the current goals of Bonnell. However, experience from EPA sanctioned bench scale tests and experience with full scale SVE systems suggests that low level cleanup standards may not be achievable in practical periods of time.

Both laboratory and field data in recent literature and from EPA sites indicate the difficulty which may exist in terms of cleaning the soils to remediation targets. Residual NAPL can be extremely difficult to mobilize by hydraulic means alone in cases of fine grained media (Kueper, et al., 1993) and, therefore, the ability of the SVE to reach such low-level cleanup standards is a projection based on conceptual analyses. The key issue in this case will be the length of time required to meet the specific soil cleanup targets and the possible negative effects of contaminated groundwater (Urban, 1993) on the SVE system results.

4.2.1 Engineering Plans

The engineering plan recommended for a VES in the former degreasing area is based on the observed response of the subsurface materials to vapor extractions tests. The system consists of a vapor treatment plant and one vapor extraction point, VEW-5. Magnahelic gauges placed in adjacent VEWs and temporary soil gas probes (Figures 11 and 12) indicated that a 2-horsepower blower is able to affect soils in this area with an effective radius of 38 feet (Figure 13).

The unit is capable of producing 100 CFM at 20 inches of water vacuum as shown on the performance curve. The VES plant utilizes the same equipment which was used during the VES testing. The only change was that the system is now located in a protected area adjacent to SWMU-49.

The VES selection was based on the plan to keep the vacuum pit within 10 feet of the VEWs. Due to the low concentrations (5 ppm) currently being extracted, any system more permanent than described is not recommended. Additionally, the smaller portable unit will allow Bonnell to test and remediate other SWMUs at a later date. Engineering conceptual drawings of the VES treatment unit and the well and piping layout are shown in Figures 15 and 16.

4.2.2 SVE Shutdown Criteria

On the basis of field tests, site characteristic and SVE experience, three criteria have been established for determining the point at which the SVE system will be shut down. Once the criteria have been met and the system shuts down, verification soil sampling will occur. The three SVE shutdown criteria are:

1. The SVE system will operate until VOC concentrations in the offgas discharged from the vacuum pump are reduced to less than 2 percent of the initial offgas concentrations. If the reduced concentration remains the same or decreases after five days, the SVE system will be shut down. For SWMU-49 this value is 10 ppm.

2. Vapor concentration readings of the installed VEWs used as monitoring points will be measured immediately after shutdown and again at two-day intervals for a ten-day period. This step will allow for vapor diffusion and vapor equilibrium to be re-established. If the vapor concentration remains at 10 ppm or below at each monitoring point over the ten-day period, the system will remain shut down and the second criterion will have been satisfied.

3. When the second criterion has been met, two soil samples will be collected adjacent to each monitoring point (VEW-1, VEW-2, VEW-4, VEW-6). The specific depths of the samples and the sampling method are described in the following section (4.2.3 Verification Soil Sampling Plan). If concentrations in the soil samples are below the PCE cleanup goal the cleanup will be considered completed.

4.2.3 Verification Soil Sampling Plan

Verification soil samples will be collected at five locations at depths of five and ten feet to determining VOC concentrations in soils after SVE system shut-down. The soil sample locations will be adjacent to VEW-1, VEW-2, VEW-3, VEW-4 and VEW-6 which are now used as monitoring points for vapor concentrations.

Each verification soil sample will be collected by driving a 2-inch O.D. sampler (4 inches long) with a stainless steel liner into the silt to the appropriate depth (ASTM, Standard Practice for Sampling Soils for Volatile Organics, Method D-4547-91, Practice D 3550). After retrieving the sample the workers will immediately cover the sample tube ends with TFE-fluorocarbon sheets, plastic caps and sealing tape around the caps. This method will limit the possible escape of VOCs by handling in the field.

All soil samples will be labelled and placed immediately into an ice-filled cooler. Soils will be analyzed using EPA Test Method 8260.

SECTION 5
REFERENCES

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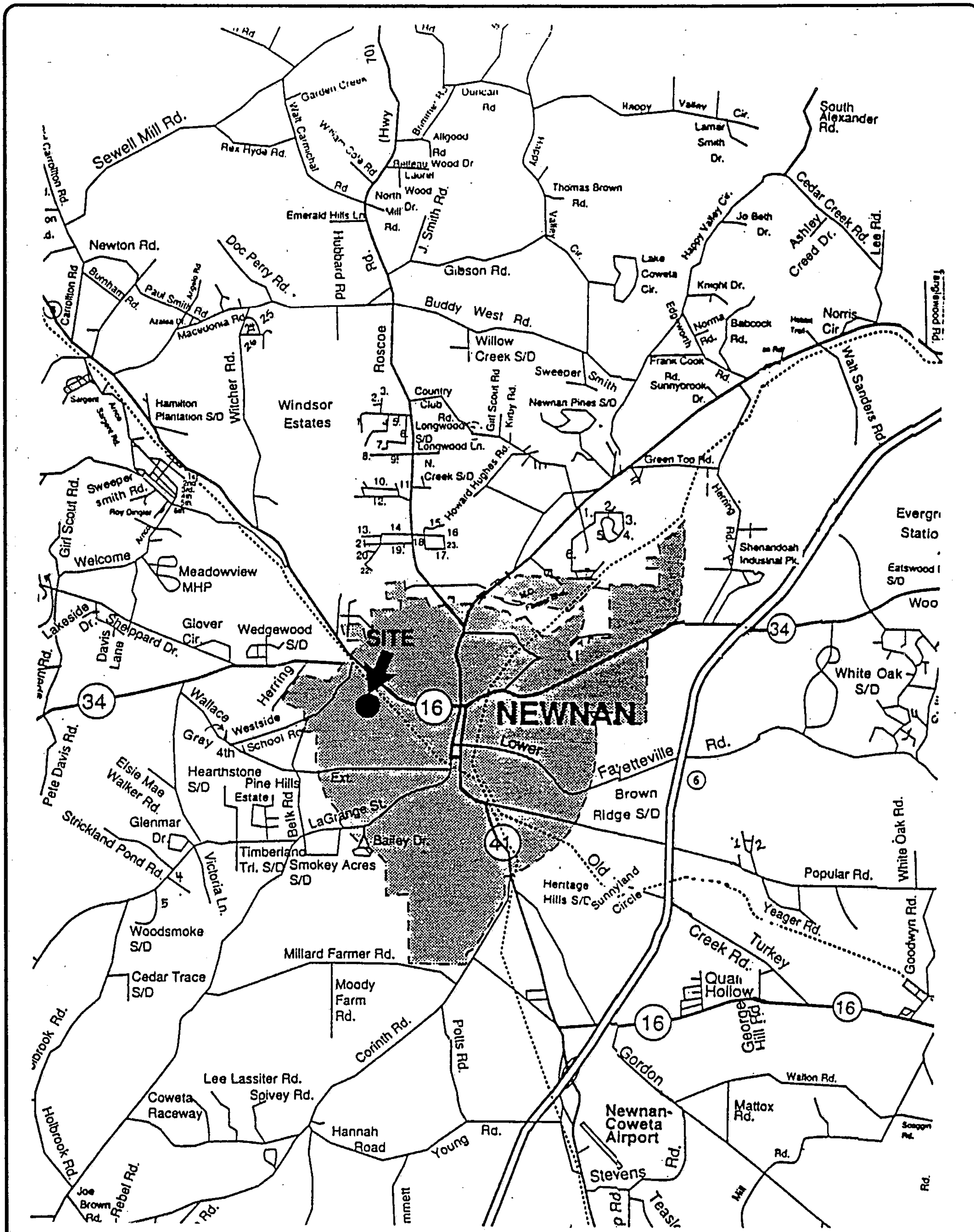
Urban, David B. 1993. Industrial Wastewater. *Groundwater Contamination Effects Soil Vapor Extraction.* August-September. pp. 61-63.

FIGURES



EMCON SOUTHEAST	THE WILLIAM L. BONNELL COMPANY STAGE II PCE/TCE SOURCE INVESTIGATION NEWNAN, GEORGIA
	SITE LOCATION MAP
FIGURE NO. 1	PROJECT NO. 2040.004.92

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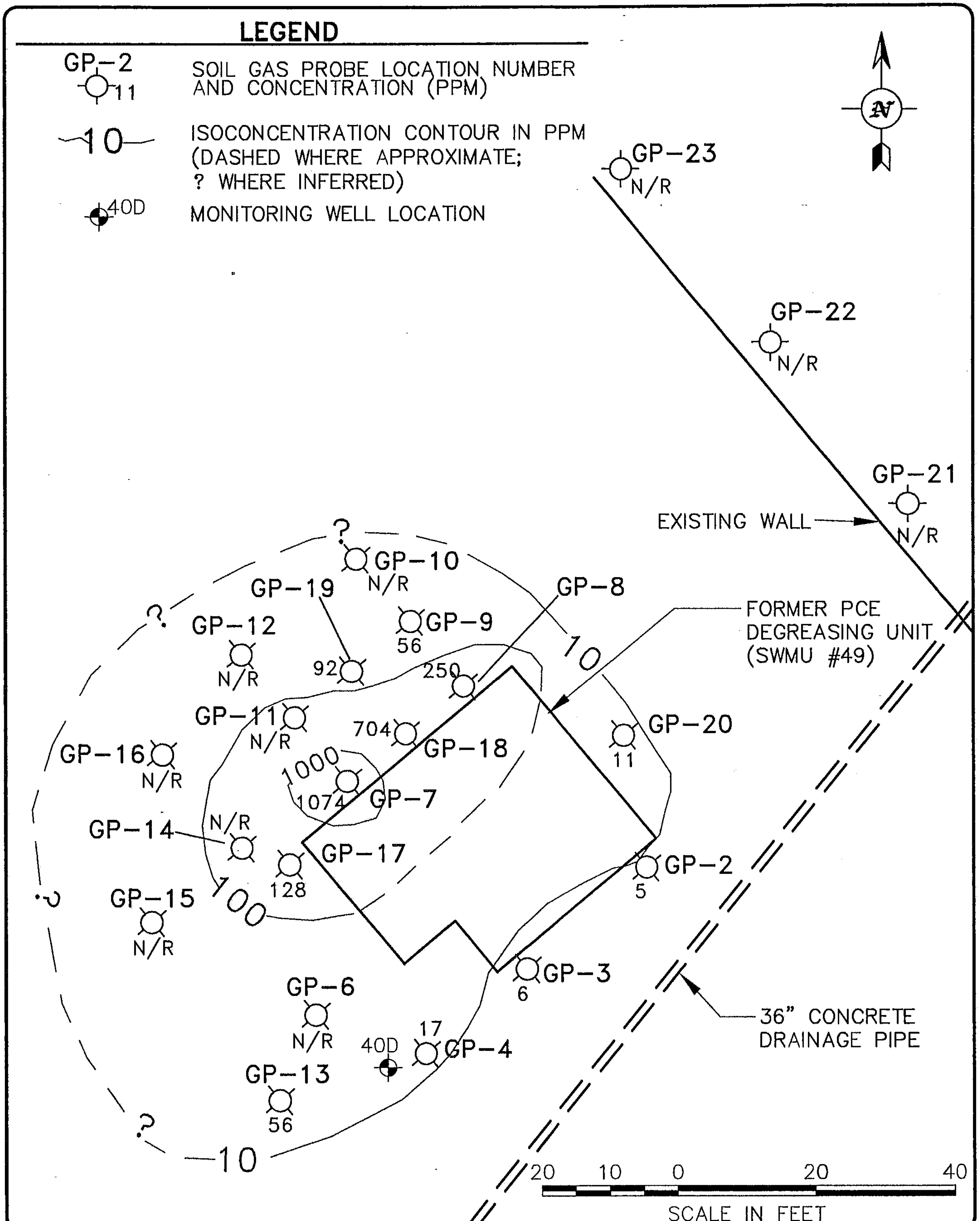

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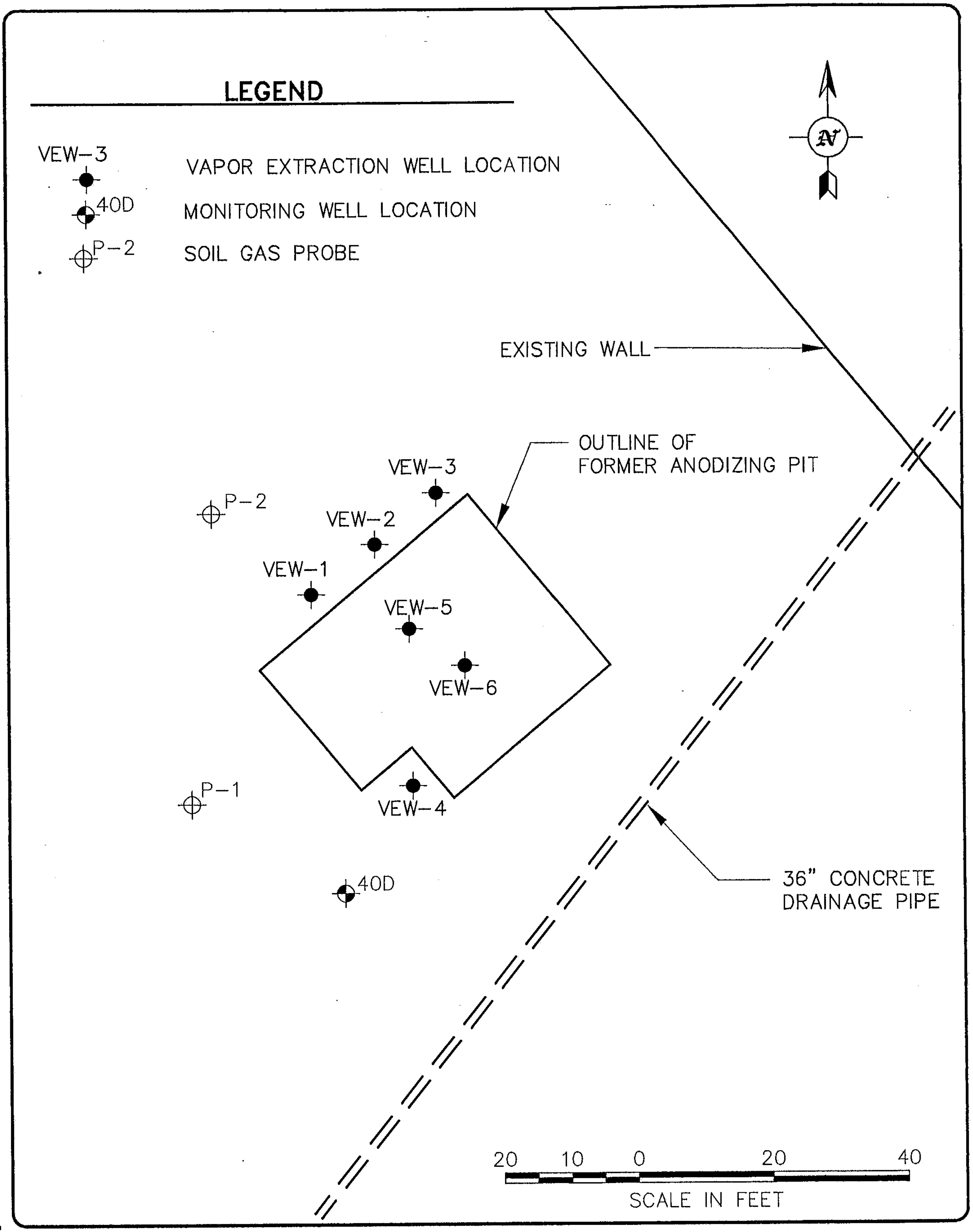
EMCON SOUTHEAST

THE WILLIAM L. BONNELL COMPANY
STAGE II PCE/TCE SOURCE INVESTIGATION
NEWNAN, GEORGIA

SOIL VAPOR CONCENTRATIONS AT 11 FEET

FIGURE NO. 2

PROJECT NO. 2040.004.92



EMCON SOUTHEAST

THE WILLIAM L. BONNELL COMPANY
STAGE II PCE/TCE SOURCE INVESTIGATION
NEWNAN, GEORGIA

LOCATIONS OF VAPOR EXTRACTION WELLS AND SOIL GAS PROBES

FIGURE NO. 3

PROJECT NO. 2040.004.92

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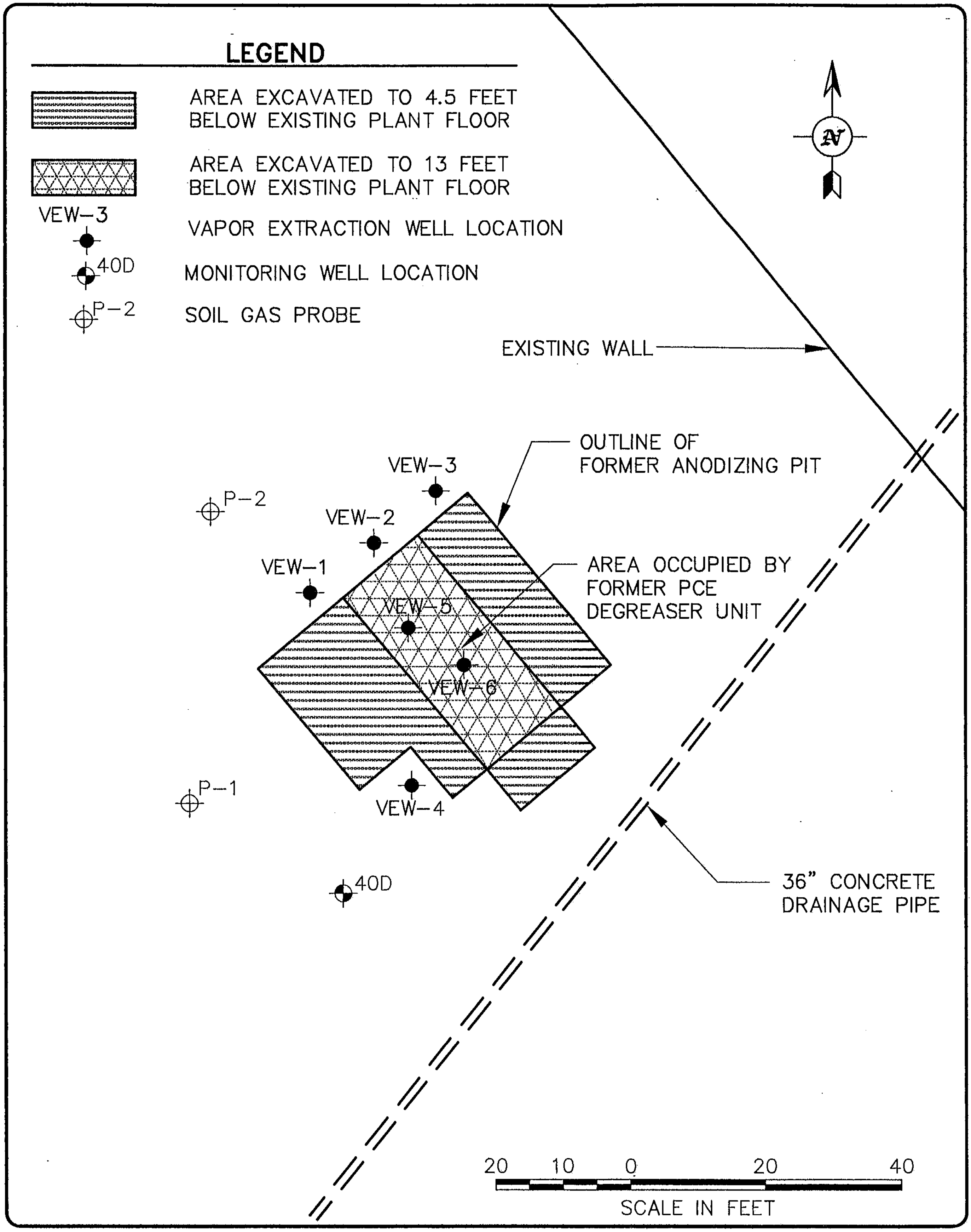

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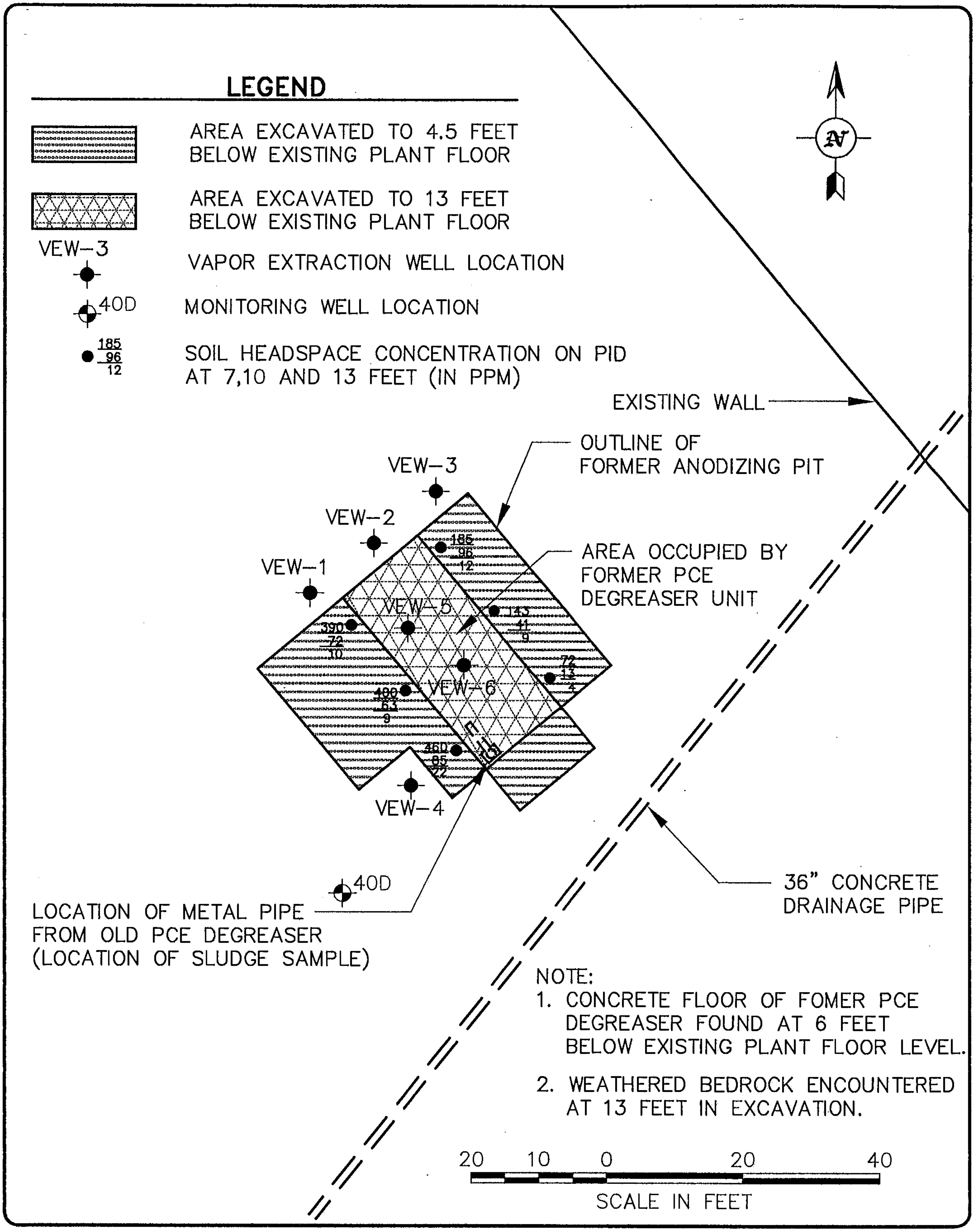
EMCON SOUTHEAST

THE WILLIAM L. BONNELL COMPANY
STAGE II PCE/TCE SOURCE INVESTIGATION
NEWNAN, GEORGIA

LOCATION OF EXCAVATION AT SWMU-49

FIGURE NO. 4

PROJECT NO. 2040.004.92



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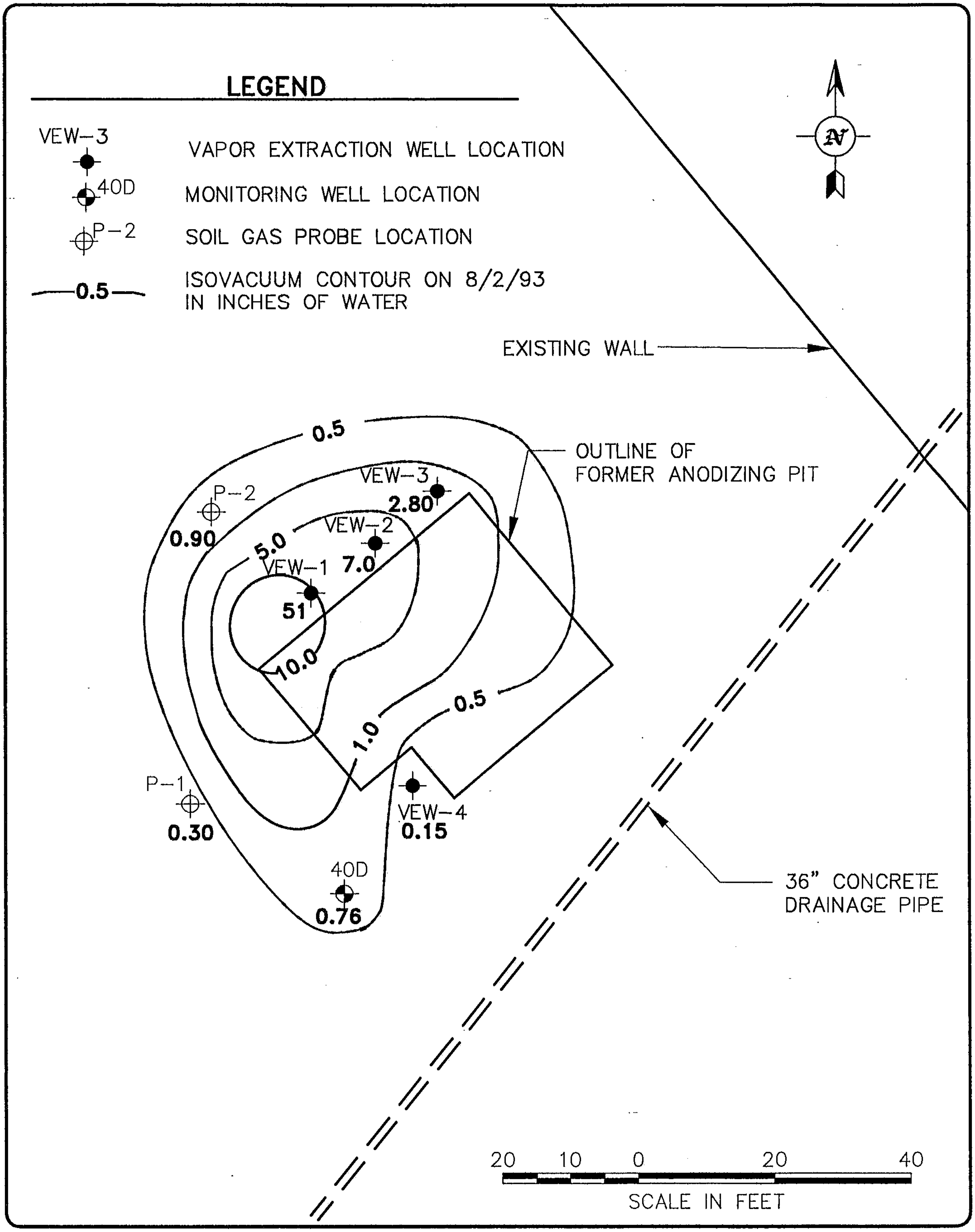
EMCON SOUTHEAST

THE WILLIAM L. BONNELL COMPANY
STAGE II PCE/TCE SOURCE INVESTIGATION
NEWNAN, GEORGIA

PID HEADSPACE CONCENTRATIONS AT 7, 10 AND 13 FEET

FIGURE NO. 5

PROJECT NO. 2040.004.92



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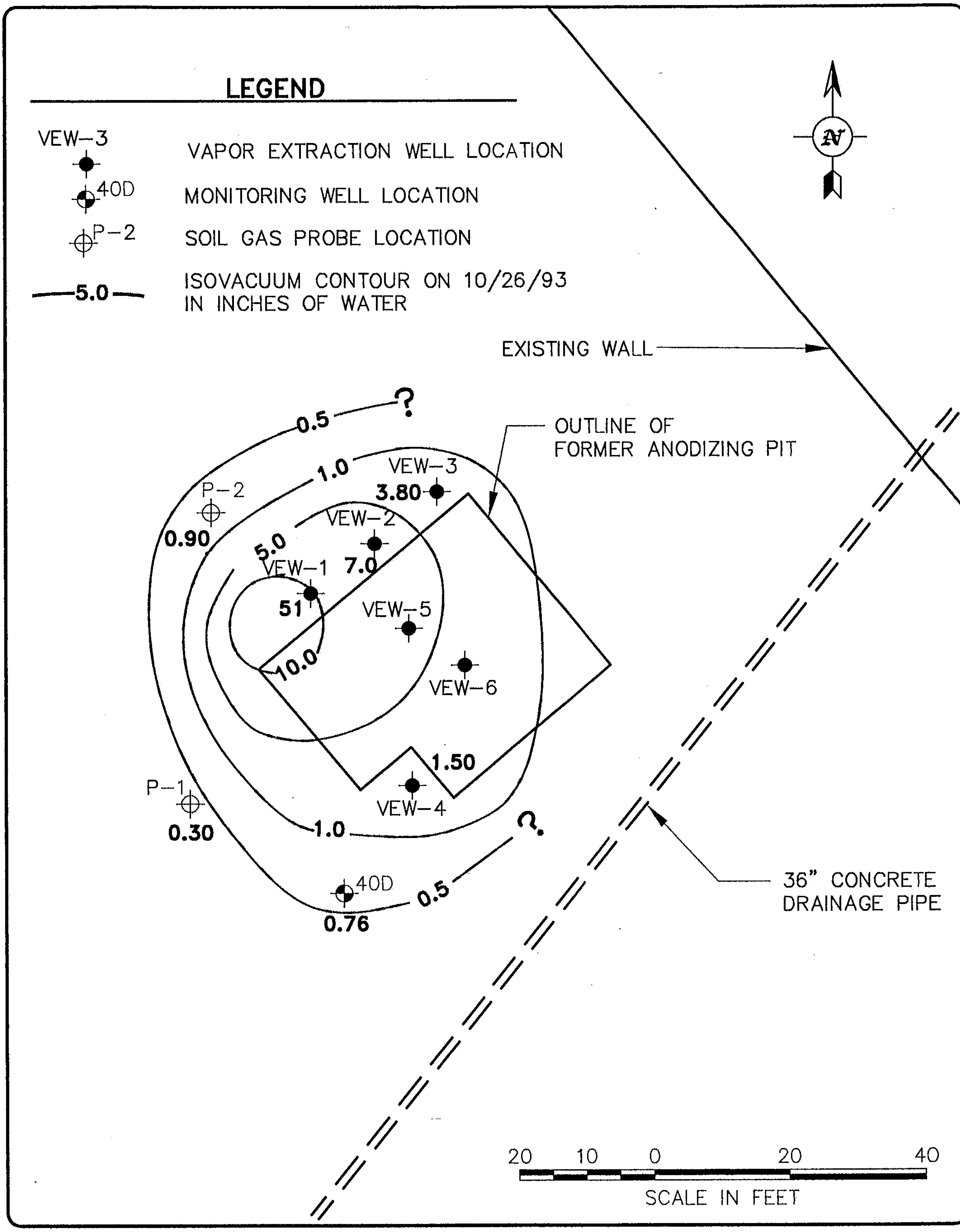
EMCON SOUTHEAST

THE WILLIAM L. BONNELL COMPANY
STAGE II PCE/TCE SOURCE INVESTIGATION
NEWNAN, GEORGIA

VEW-1 RADIUS OF INFLUENCE
BEFORE EXCAVATION

FIGURE NO.
6

PROJECT NO.
2040.004.92



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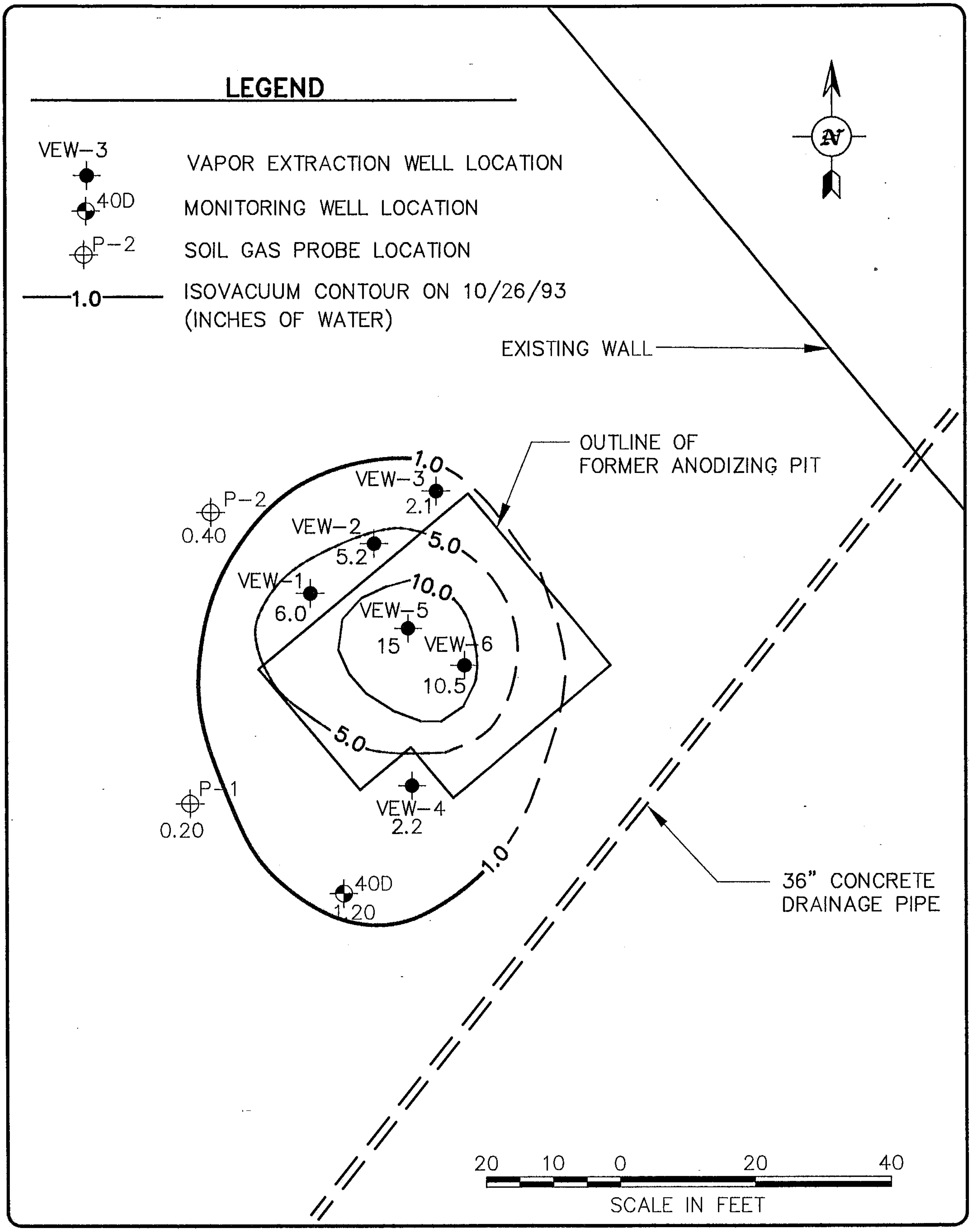
EMCON SOUTHEAST

THE WILLIAM L. BONNELL COMPANY
STAGE II PCE/TCE SOURCE INVESTIGATION
NEWNAN, GEORGIA

VEW-1 RADIUS OF INFLUENCE AFTER EXCAVATION

FIGURE NO. 7

PROJECT NO. 2040.004.92



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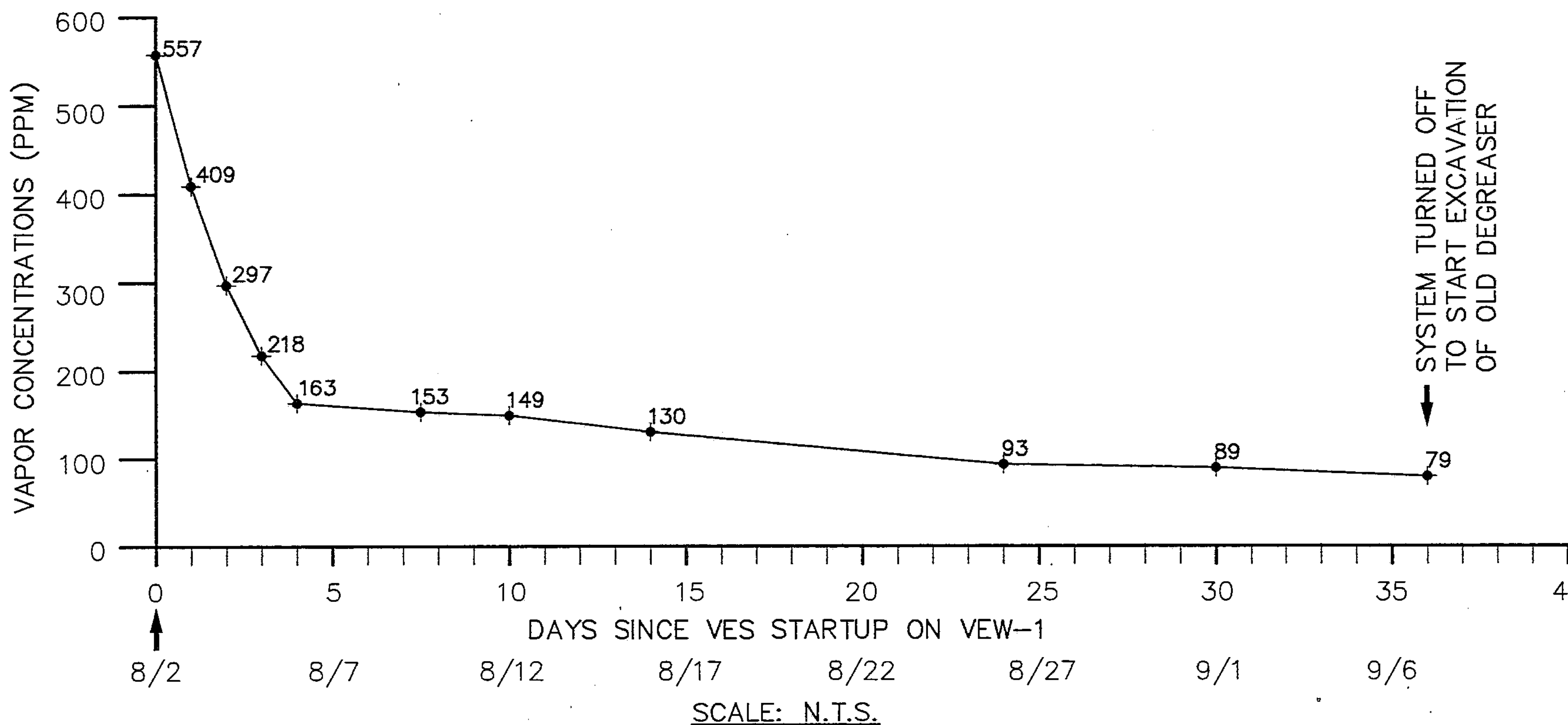
EMCON SOUTHEAST

THE WILLIAM L. BONNELL COMPANY
STAGE II PCE/TCE SOURCE INVESTIGATION
NEWNAN, GEORGIA

VEW-5 RADIUS OF INFLUENCE

FIGURE NO. 8

PROJECT NO. 2040.004.92



NOTE: CONCENTRATIONS AS MEASURED ON PID CALIBRATED TO TOLERENCE.

EMCON SOUTHEAST

THE WILLIAM L. BONNELL COMPANY
STAGE II PCE/TCE SOURCE INVESTIGATION
NEWNAN, GEORGIA

VAPOR CONCENTRATION VERSUS TIME FOR VEW-1

FIGURE NO. 9

PROJECT NO. 2040.004.92

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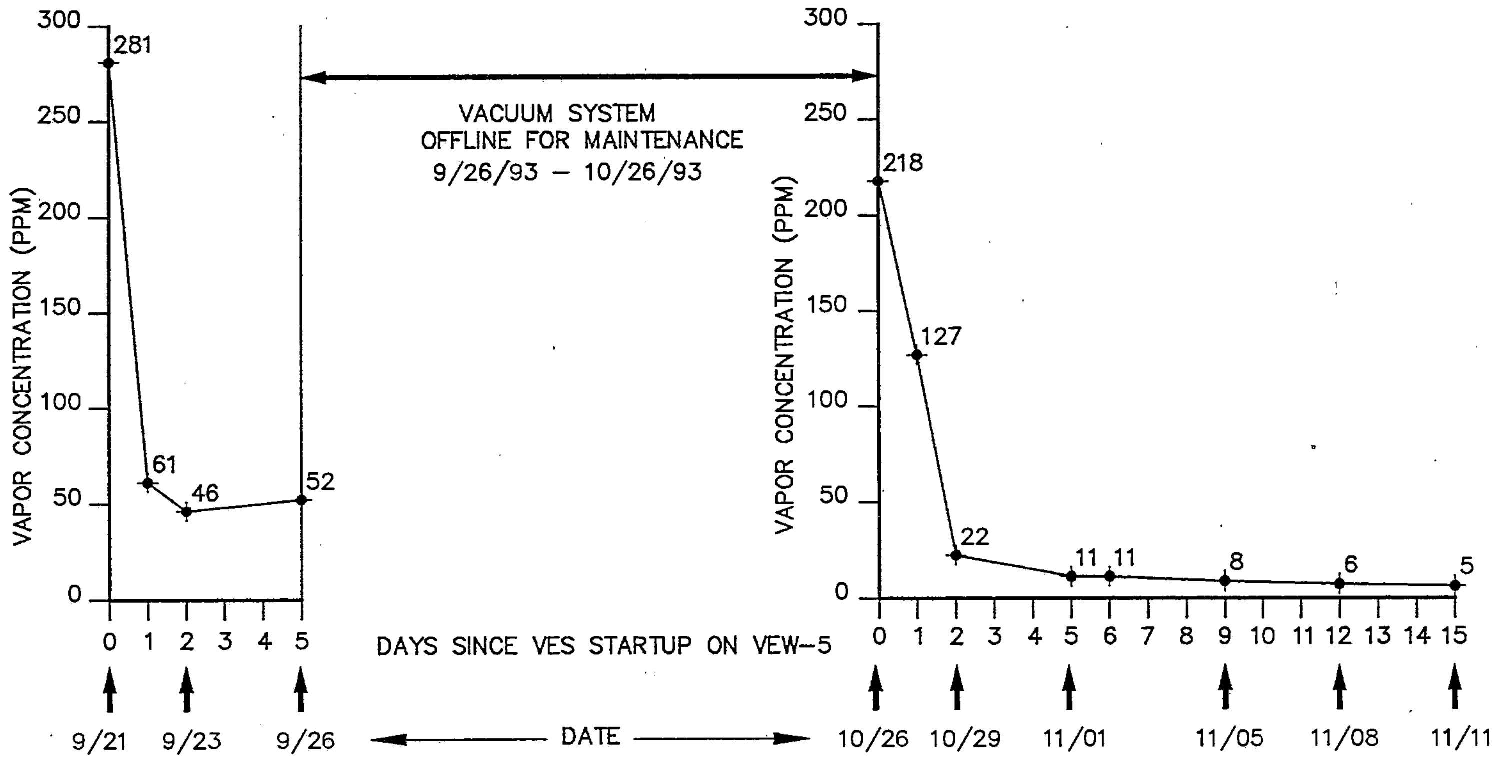

SCALE: N.T.S.

EMCON SOUTHEAST

THE WILLIAM L. BONNELL COMPANY
STAGE II PCE/TCE SOURCE INVESTIGATION
NEWNAN, GEORGIA

VAPOR CONCENTRATION VERSUS TIME FOR VEW–5

FIGURE NO. 10

PROJECT NO. 2040.004.92

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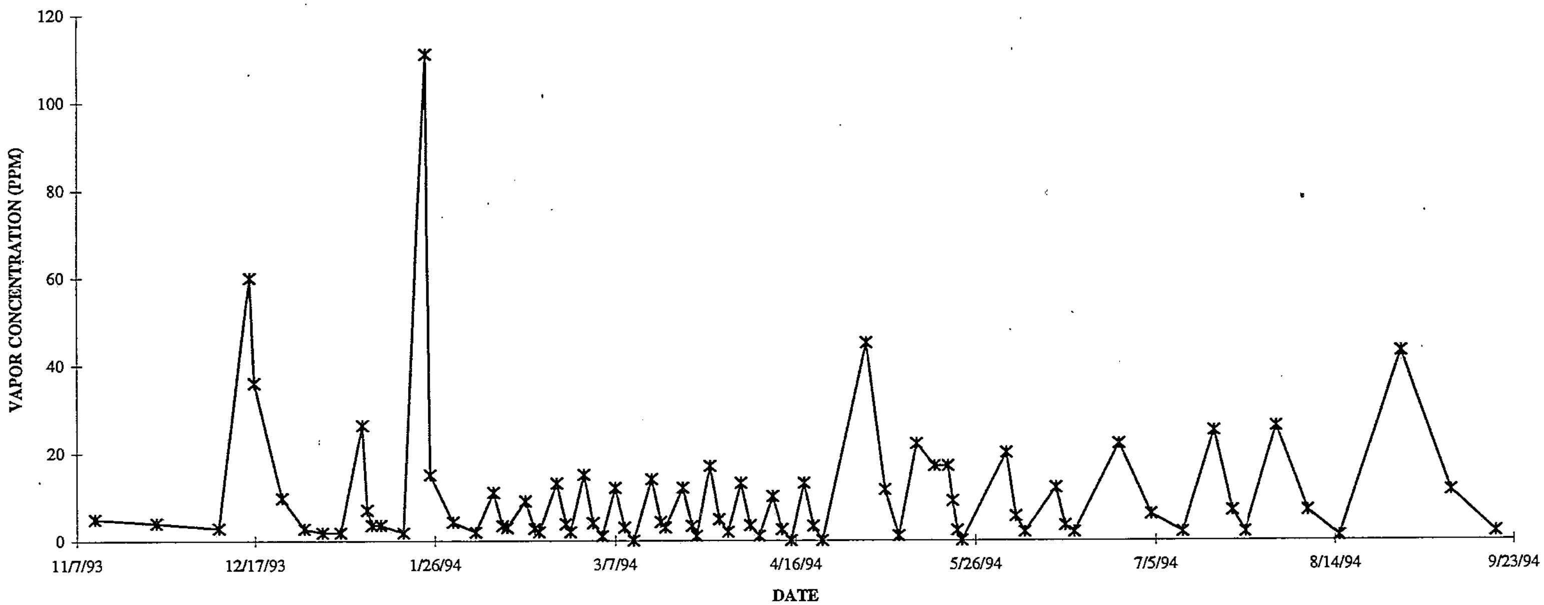

EMCON SOUTHEAST

THE WILLIAM L. BONNELL COMPANY
STAGE II PCE/TCE SOURCE INVESTIGATION
NEWNAN, GEORGIA

VAPOR CONCENTRATION VERSUS TIME FOR VEW-5

FIGURE NO.
10A

PROJECT NO.
2040.004.92

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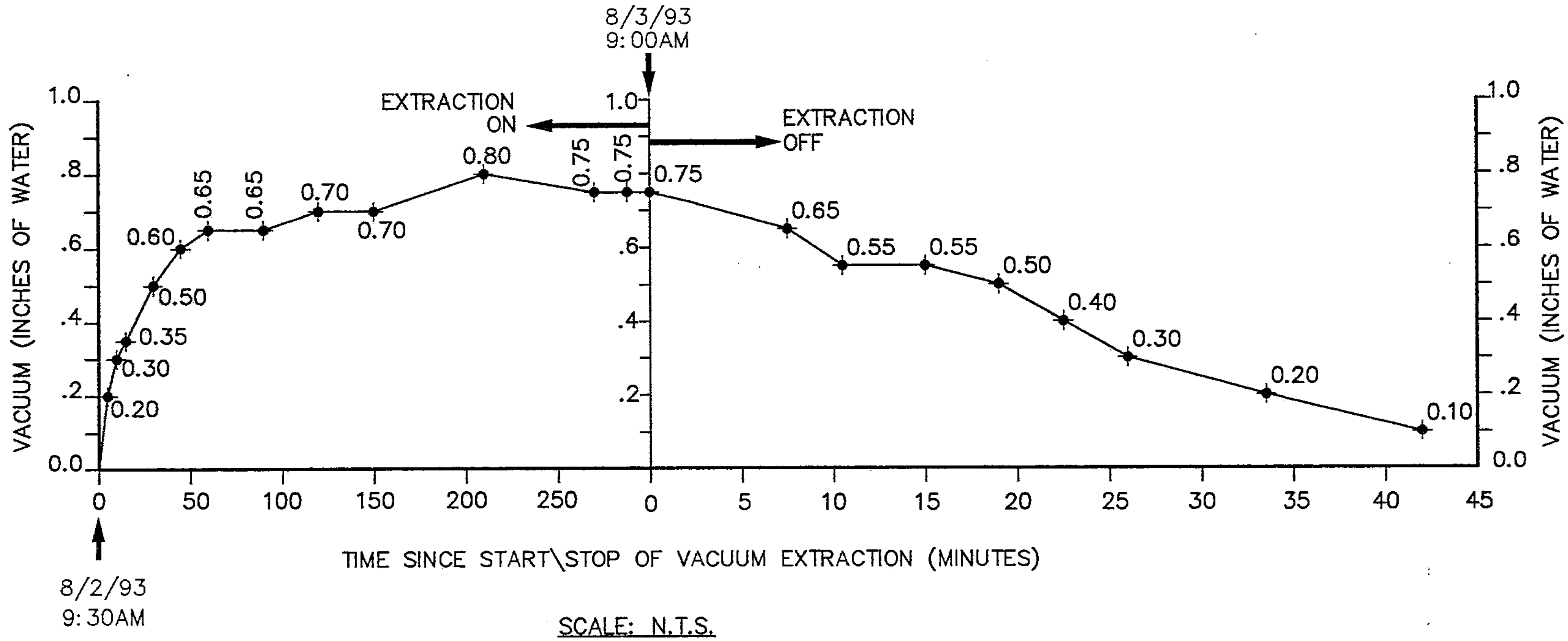


SCALE: N.T.S.

NOTE:
EXTRACTING FROM VEW-1, VACUUM RESPONSE AT PROBE P-2 (DISTANCE FROM VEW-1 = 26 FEET)

M:\2040\004\92\011

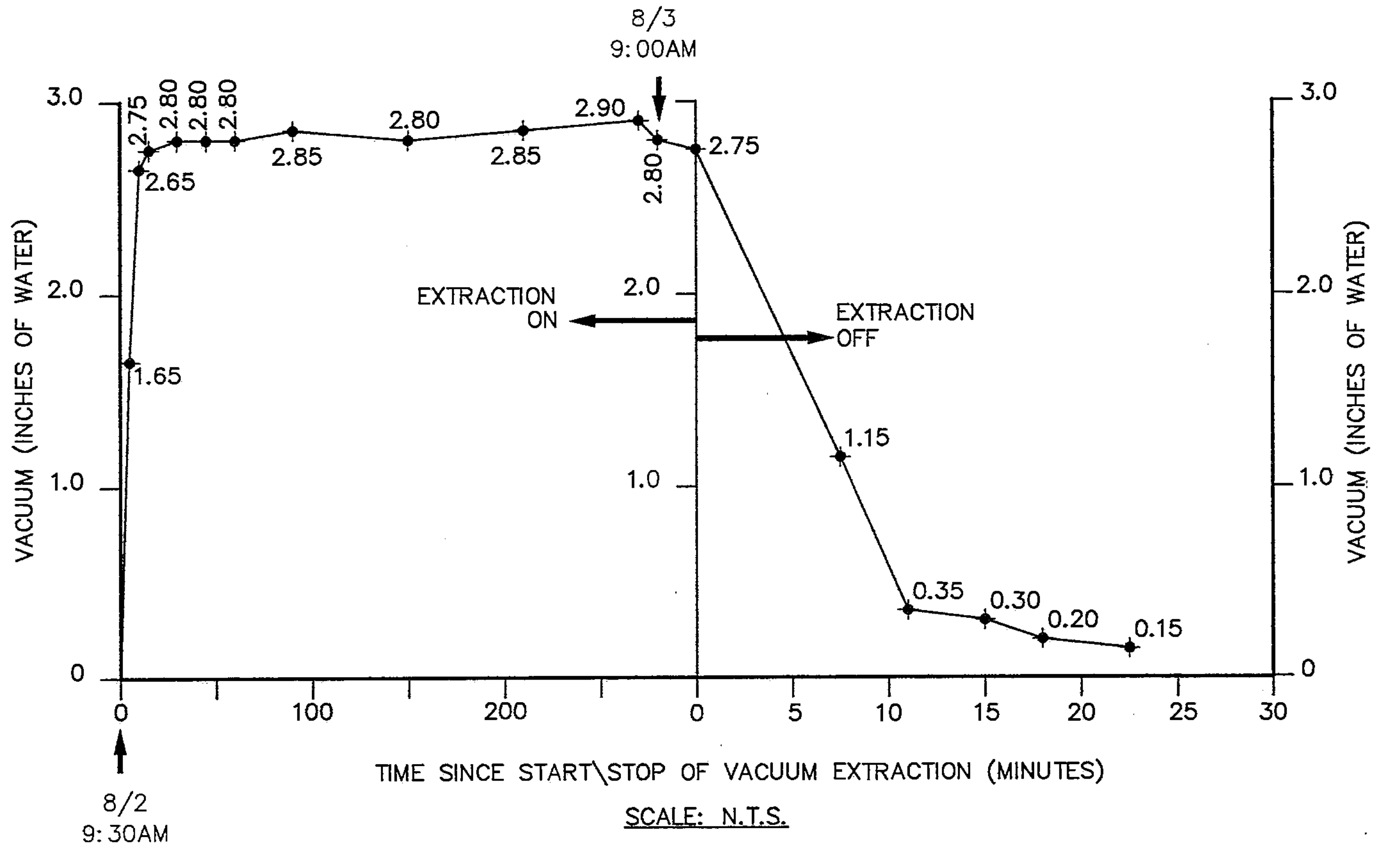
EMCON SOUTHEAST

THE WILLIAM L. BONNELL COMPANY
STAGE II PCE/TCE SOURCE INVESTIGATION
NEWNAN, GEORGIA

FORMATION RESPONSE TO VACUUM AT PROBE P-2

FIGURE NO. 11

PROJECT NO. 2040.004.92



SCALE: N.T.S.

NOTE:
EXTRACTING FROM VEW–1, VACUUM RESPONSE AT VEW–3 (DISTANCE FROM VEW–1 = 22 FEET)

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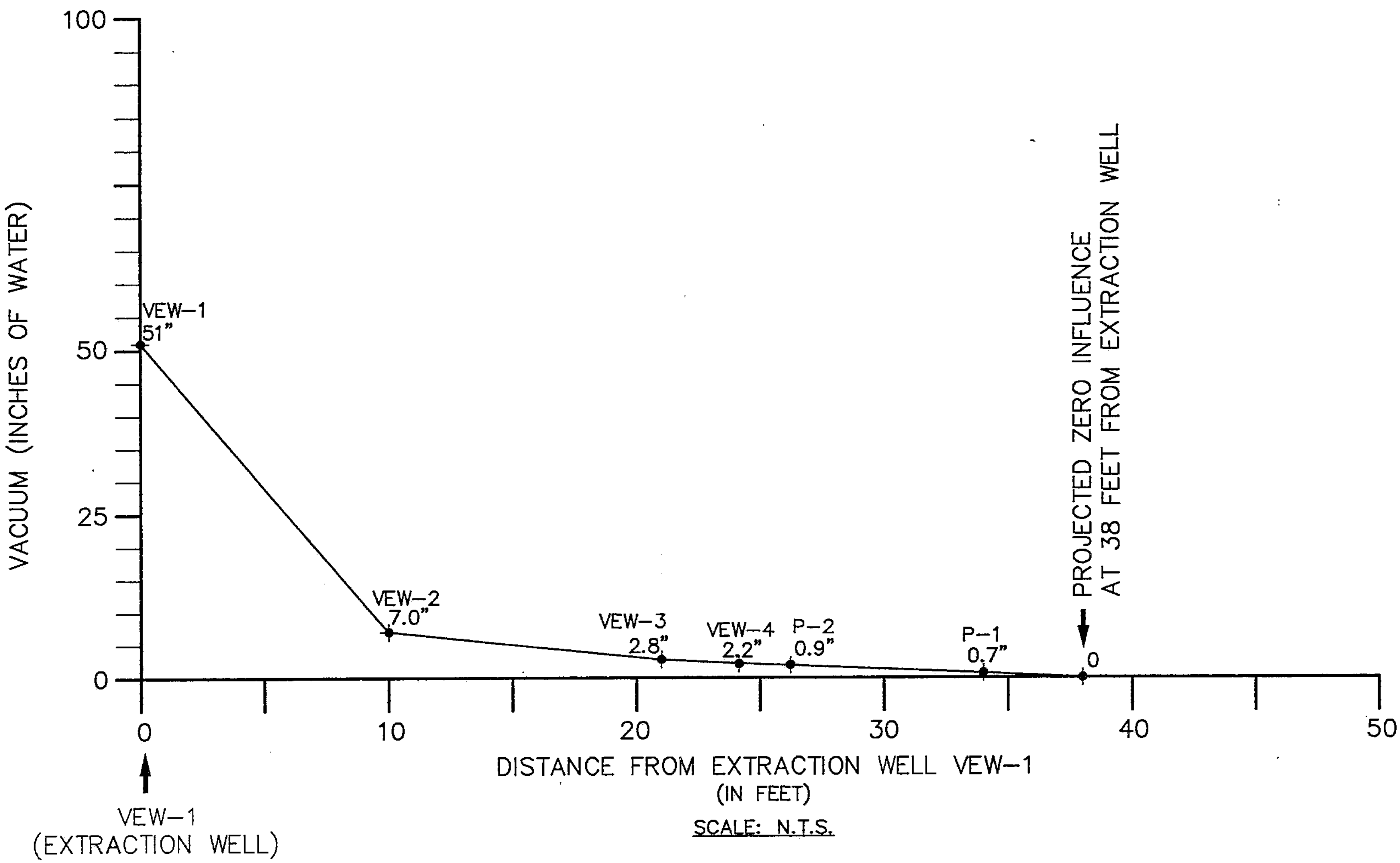
EMCON SOUTHEAST

THE WILLIAM L. BONNELL COMPANY
STAGE II PCE/TCE SOURCE INVESTIGATION
NEWNAN, GEORGIA

WELL RESPONSE TO VACUUM AT VEW–3

FIGURE NO. 12

PROJECT NO. 2040.004.92



NOTE:
DATA FROM 2 H.P. GAS BLOWER AND 2" O.D. EXTRACTION WELL.

EMCON SOUTHEAST

THE WILLIAM L. BONNELL COMPANY
STAGE II PCE/TCE SOURCE INVESTIGATION
NEWNAN, GEORGIA

VAPOR EXTRACTION RADIUS OF INFLUENCE PLOT

FIGURE NO. 13

PROJECT NO. 2040.004.92

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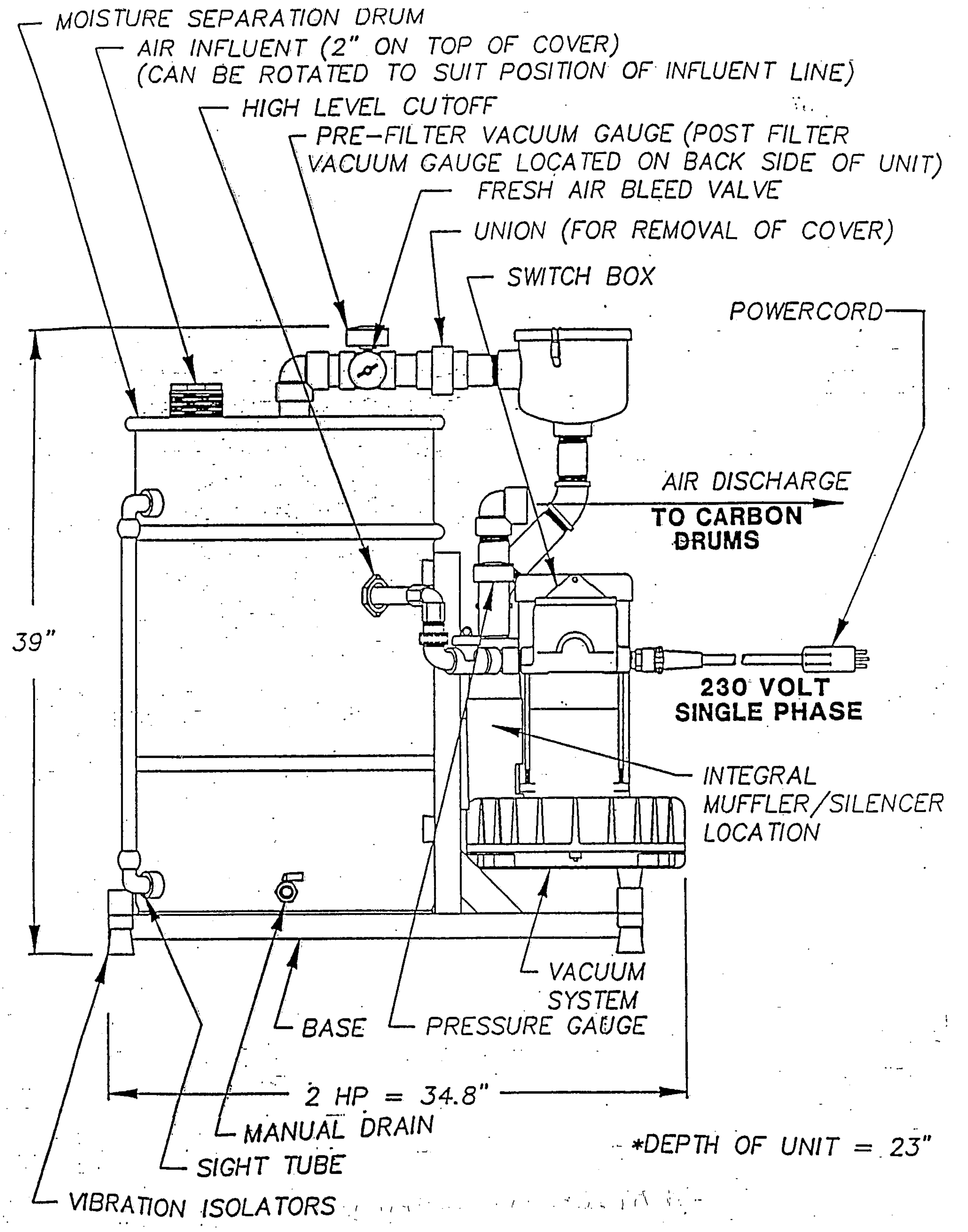

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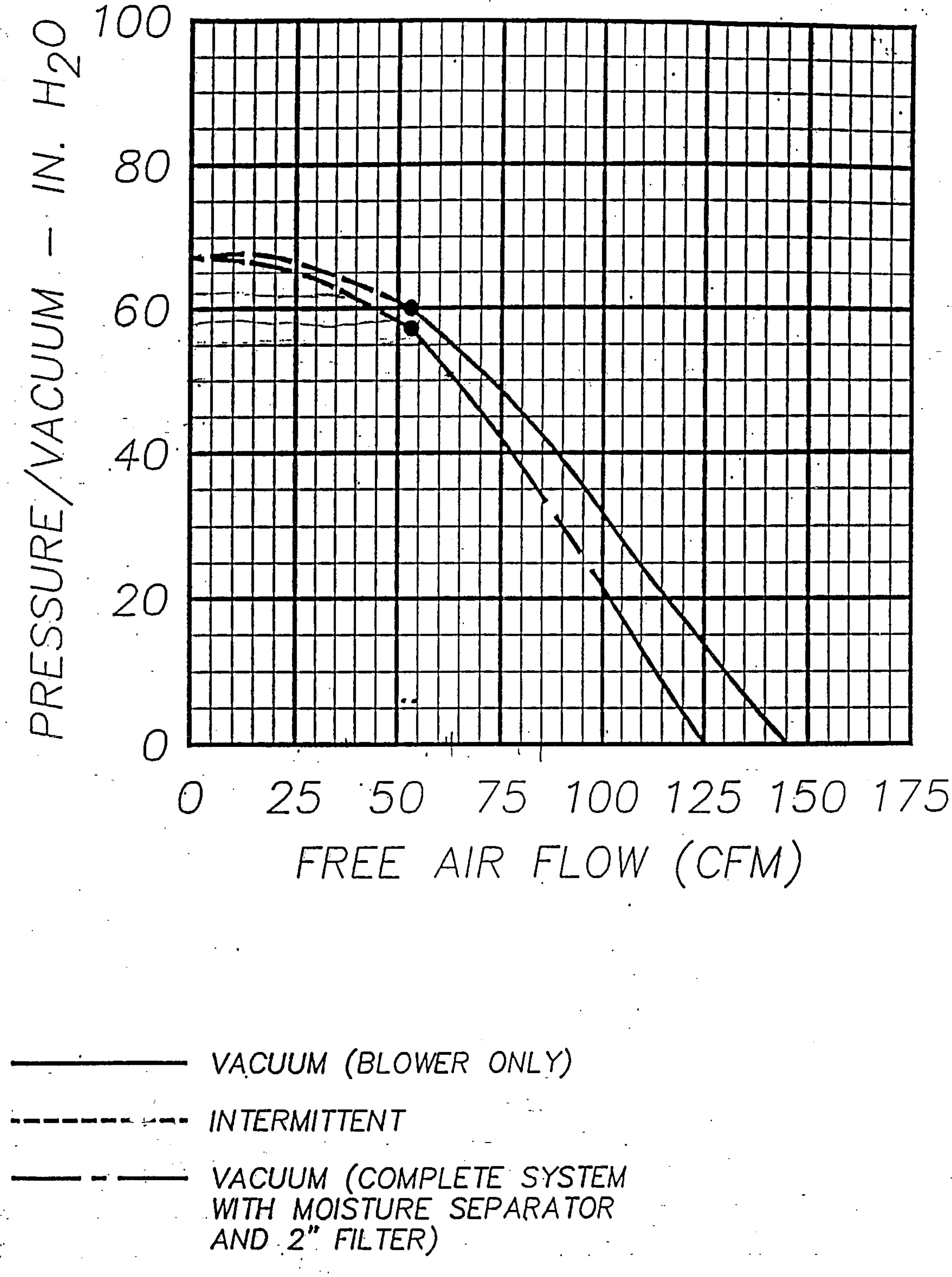
EMCON SOUTHEAST

THE WILLIAM L. BONNELL COMPANY
STAGE II PCE/TCE SOURCE INVESTIGATION
NEWNAN, GEORGIA

VACUUM SYSTEM AND
MOISTURE SEPARATOR DETAILS

FIGURE NO.
14

PROJECT NO.
2040.004.92



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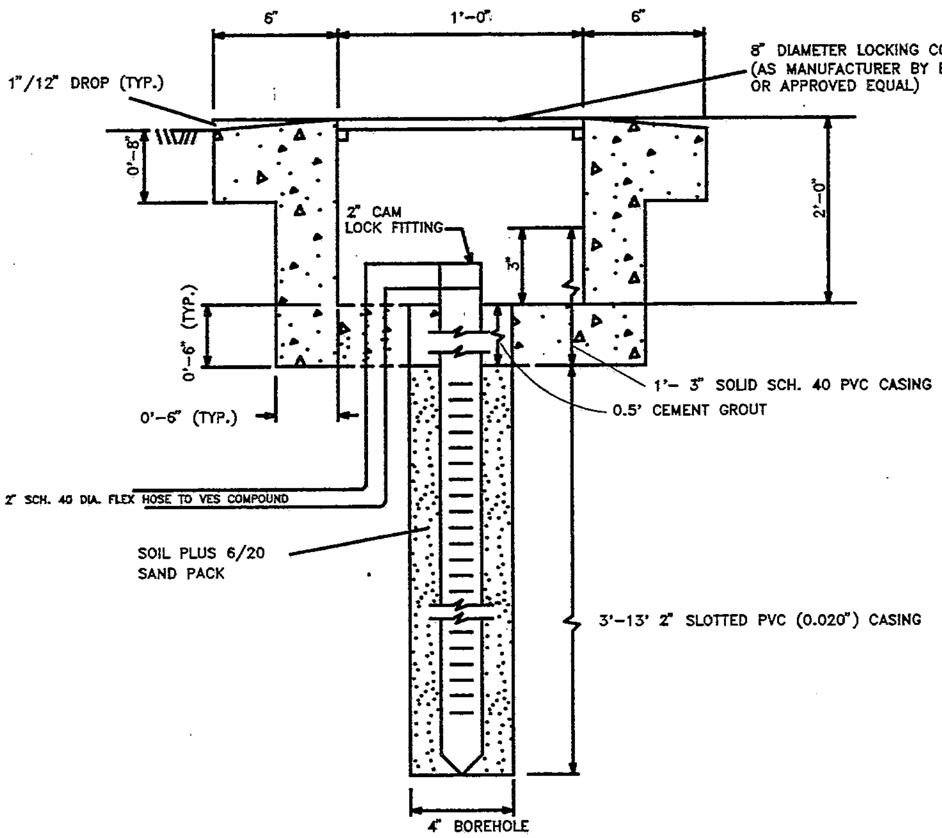
EMCON SOUTHEAST

THE WILLIAM L. BONNELL COMPANY
STAGE II PCE/TCE SOURCE INVESTIGATION
NEWNAN, GEORGIA

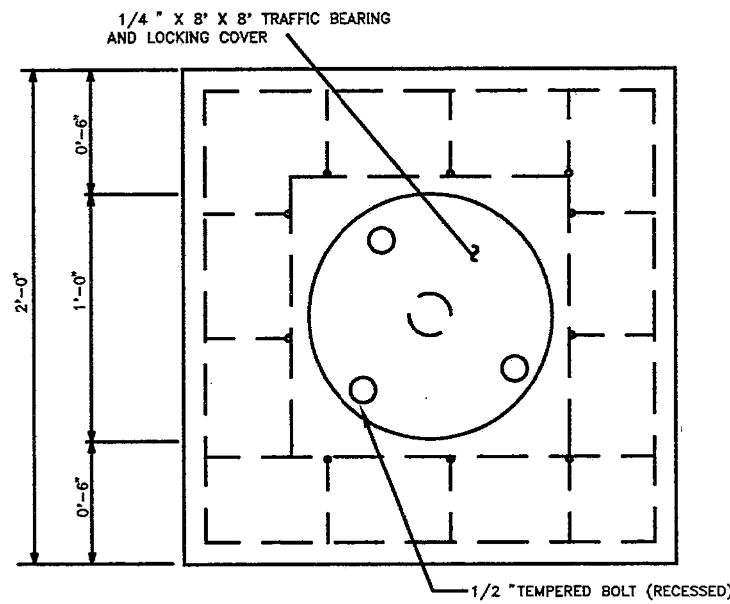
PERFORMANCE CURVE, 2 HP, VACUUM SYSTEM

FIGURE NO. 15

PROJECT NO. 2040.004.92



CROSS-SECTION
(N.T.S.)



PLAN VIEW

DRAWING NOT TO SCALE

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EMCON SOUTHEAST

THE WILLIAM L. BONNELL COMPANY
STAGE II PCE/TCE SOURCE INVESTIGATION
NEWNAN, GEORGIA

VAPOR EXTRACTION WELL AND
SURFACE SEAL DETAILS

FIGURE NO.
16
PROJECT NO.
2040.004.92

TABLES

TABLE 1: SUMMARY OF SOIL ANALYTICAL RESULTS, SWMU-49

Sample Location	PCE (μg/kg)	TCE (μg/kg)	1, 1-DCE (μg/kg)	Vinyl Chloride (μg/kg)
SO-7-8'	33	BDL	BDL	BDL
SO-7-12'	180	BDL	BDL	BDL
SO-8-8'	BDL	BDL	BDL	BDL
SO-17-8'	BDL	BDL	BDL	BDL
SO-17-12'	61	16	BDL	BDL
SO-18-8'	29	BDL	BDL	BDL
SO-18-12'	38	5	BDL	BDL
Detection Limit	5	5	5	10

Notes:
1. μg/kg = micrograms per kilogram
2. PCE = Perchloroethene
3. TCE = Trichloroethene
4. 1,1-DCE = 1,1-Dichloroethene
5. BDL = Below Detection Limit
6. Results from Analytical Services, Inc. (ASI)
7. Samples collected December 9, 1992

TABLE 1: SUMMARY OF SOIL ANALYTICAL RESULTS, SWMU-49 (CONT.)

Sample Location	Ethylbenzene (μg/kg)	Toluene (μg/kg)	Xylenes (μg/kg)
SO-7-8'	BDL	BDL	BDL
SO-7-12'	BDL	BDL	BDL
SO-8-8'	BDL	BDL	BDL
SO-17-8'	BDL	BDL	BDL
SO-17-12'	BDL	BDL	BDL
SO-18-8'	BDL	BDL	BDL
SO-18-12'	BDL	BDL	BDL
Detection Limit	5	5	10

Notes:

1. μg/kg = micrograms per kilogram
2. PCE = Perchloroethene
3. TCE = Trichloroethene
4. 1,1-DCE = 1,1-Dichloroethene
5. BDL = Below Detection Limit
6. Results from Analytical Services, Inc. (ASI)
7. Samples collected December 9, 1992

TABLE 2: VAPOR CONCENTRATION VERSUS TIME FOR EXTRACTION WELL VEW-1 AT 57 CFM

Date	Time	Concentration (ppm)	Removal Rate	
			Pounds PCE Per Hour	Equivalent Gallons PCE Per Day
08-02-93	11:30 a.m.	557	0.83	1.84
08-03-93	9:00 a.m.	409	0.61	1.35
08-04-93	4:00 p.m.	297	0.44	0.98
08-05-93	8:30 a.m.	218	0.33	0.72
08-06-93	8:30 a.m.	163	0.24	0.54
08-06-93	4:30 p.m.	153	0.23	0.50
08-12-93	4:30 p.m.	149	0.22	0.49
08-16-93	7:30 p.m.	130	0.19	0.43
08-26-93	7:30 p.m.	93	0.14	0.31
09-01-93	10:30 a.m.	89	0.13	0.29
09-07-93	10:30 a.m.	79	0.12	0.26

Notes:

1. Concentrations measured on a PID calibrated daily to a Toluene Gas Standard.
2. Vapor Extraction Removal Rate Calculation:
   $MR = (C \times ppmV \times CFM)/R_g$
   Where: MR = Mass Removed in lb/hr;
   C = a conversion constant,
   $((60\ min/hr)/(1 \times 10^{-6})(379\ ft^3/lb\text{-}mole)$
   ppmV = parts per million by volume;
   CFM = Cubic Feet per Minute; and
   R_g = ideal gas constant = 379 ft^3/lb-mole
3. Molecular Weight of PCE = 165.85 grams per mole
4. Mass of PCE = 10.9 pounds per gallon.

TABLE 3; VACUUM RESPONSE OF PROBE P-2 AND WELL VEW-3 WHILE EXTRACTING FROM VEW-1

Elapsed Time From Start of Vapor Extraction (Minutes)	Gauge Reading at P-2 (inches of water)	Gauge Reading at VEW-3 (inches of water)
5	0.20	1.65
10	0.30	2.65
15	0.35	2.75
30	0.50	2.80
45	0.60	2.80
60	0.65	2.80
90	0.65	2.85
120	0.70	2.80
150	0.70	2.85
210	0.80	2.90
270	0.75	2.80

Notes:

1. Extraction Rate = 57 cubic feet per minute (CFM).
2. Distance from VEW-1 to P-2 is 26 feet.
3. Distance from VEW-1 to VEW-3 is 22 feet.
4. Gauges used were Magnahelic Type.

TABLE 4: CONCENTRATION VERSUS TIME FOR EXTRACTION WELL VEW-5

Date	Time	Concentration (ppm)	Removal Rate	
			Pounds PCE per Hour	Equivalent gallons of PCE per day
09-21-93	1:00 p.m.	281	0.70	1.54
09-22-93	9:22 a.m.	61	0.15	0.33
09-23-93	8:30 a.m.	46	0.11	0.24
09-26-93	1:20 p.m.	52	0.13	0.29
10-26-93	9:45 a.m.	218	0.54	1.19
10-27-93	10:45 a.m.	127	0.32	0.70
10-29-93	4:30 p.m.	22	0.05	0.11
11-01-93	2:00 p.m.	11	0.03	0.07
11-02-93	4:00 p.m.	11	0.03	0.07
11-04-93	10:30 a.m.	4	0.01	0.02

Notes:

1. Concentrations measured on a PID calibrated daily to a toluene gas standard.
2. Extraction rate was 95 CFM.
3. Vapor Extraction Removal Rate Calculation:
   $MR = (C \times ppmV \times CFM)/R_g$
   Where: MR = Mass Removed in lb/hr;
   C = a conversion constant,
   $((60 \text{ min/hr})/(1 \times 10^{-6})(379 \text{ ft}^3\text{/lb-mole})$
   ppmV = parts per million by volume;
   CFM = Cubic Feet per Minute; and
   R_g = ideal gas constant = 379 ft^3/lb-mole
3. Molecular Weight of PCE = 165.85 grams per mole
4. Mass of PCE = 10.9 pounds per gallon.
5. System off for blower servicing between 9/26/93 and 10/26.93.

TABLE 4A: VAPOR CONCENTRATION VERSUS TIME FOR EXTRACTION WELL VEW-5

Start Date/Time	End Date/Time	Average Concentration (ppm)	Pounds PCE Removed
11/11/93 @ 12:40	12/9/93 @ 11:00	4	6.34
SYSTEM OFF 12/9/93 THROUGH 12/16/93			
12/16/93 @ 12:40	12/17/93@ 14:40	48	2.84
12/17/93 @ 14:40	12/28/93 @ 11:40	9.7	5.75
12/28/93 @ 11:40	1/5/94 @ 13:40	1.8	0.79
SYSTEM OFF 1/5/94 THROUGH 1/10/94			
1/10/94 @ 12:15	1/10/94 @ 12:30	24.7	0.01
1/10/94 @ 12:30	1/10/94 @ 16:15	15	0.13
1/10/94 @ 16:15	1/14/94 @ 15:20	3.6	0.78
1/14/94 @ 15:20	1/19/94 @ 13:20	1.8	0.48
SYSTEM OFF 1/19/94 THROUGH 1/24/94			
1/24/94 @ 14:00	1/24/94 @ 14:30	67	0.08
1/24/94 @ 14:30	1/24/94 @ 15:00	19	0.02
1/24/94 @ 15:00	2/4/94 @ 15:30	4.3	2.58
SYSTEM OFF 2/4/94 THROUGH 2/8/94			
2/8/94 @ 9:30	2/11/94 @ 15:00	3.5	0.62
SYSTEM OFF 2/11/94 THROUGH 2/15/94			
2/15/94 @ 10:00	2/18/94 @ 16:30	2.8	0.5
SYSTEM OFF 2/18/94 THROUGH 2/22/94			
2/22/94 @ 9:30	2/25/94 @ 15:30	3.8	0.67
SYSTEM OFF 2/25/94 THROUGH 2/28/94			
2/28/94 @ 10:00	3/4/94 @ 15:00	4	0.92
SYSTEM OFF 3/4/94 THROUGH 3/7/94			
3/7/94 @ 11:30	3/11/94 @ 17:30	3	0.72
SYSTEM OFF 3/11/94 THROUGH 3/15/94			

Notes:

1. Concentrations measured on a PID calibrated daily to a toluene gas standard.
2. Extraction rate was 95 CFM.
3. Vapor Extraction Removal Rate Calculation:
   $MR = (C \times ppmV \times CFM)/R_g$
   Where: MR = Mass Removed in lb/hr;
   C = a conversion constant,
   $((60 \text{ min/hr})/(1 \times 10^{-6})(379 \text{ ft}^3/\text{lb-mole})$
   ppmV = parts per million by volume;
   CFM = Cubic Feet per Minute; and
   R_g = ideal gas constant = 379 ft^3/lb-mole
3. Molecular Weight of PCE = 165.85 grams per mole
4. Mass of PCE = 10.9 pounds per gallon.
5. System off for blower servicing between 9/26/93 and 10/26.93.

TABLE 4A: VAPOR CONCENTRATION VERSUS TIME FOR EXTRACTION WELL VEW-5 (CONT.)

Start Date/Time	End Date/Time	Average Concentration (ppm)	Pounds PCE Removed
3/15/94 @ 17:00	3/18/94 @ 18:00	4.3	0.71
SYSTEM OFF 3/18/94 THROUGH 3/22/94			
3/22/94 @ 11:00	3/25/94 @ 18:00	3.3	0.59
SYSTEMS OFF 3/25/94 THROUGH 3/28/94			
3/28/94 @ 9:30	4/1/94 @ 12:15	4.8	1.08
SYSTEM OFF 4/1/94 THROUGH 4/4/94			
4/4/94 @ 14:00	4/8/94 @ 9:30	2.5	0.55
SYSTEM OFF 4/8/94 THROUGH 4/11/94			
4/11/94 @ 10:00	4/15/94 @ 11:30	2.5	0.55
SYSTEM OFF 4/15/94 THROUGH 4/18/94			
4/18/94 @ 9:45	4/22/94 @ 15:00	3.3	0.76
SYSTEM OFF 4/22/94 THROUGH 5/2/94			
5/2/94 @ 9:00	5/9/94 @ 18:00	11.5	4.63
SYSTEM OFF 5/9/94 THROUGH 5/13/94			
5/13/94 @ 18:50	5/20/94 @ 10:00	9.8	3.54
5/20/94 @ 10:30	5/23/94 @ 12:30	2.3	0.39
SYSTEM OFF 5/23/94 THROUGH 6/2/94			
6/2/94 @ 14:00	6/6/94	5.5	1.23
SYSTEM OFF 6/6/94 THROUGH 6/13/94			
6/13/94 @ 13:15	6/17/94 @ 11:45	3.5	0.79
SYSTEM OFF 6/17 \94 THROUGH 6/27/94			
6/27/94 @ 11:30	7/11/94 @ 13:00	6	4.60

Notes:

1. Concentrations measured on a PID calibrated daily to a toluene gas standard.
2. Extraction rate was 95 CFM.
3. Vapor Extraction Removal Rate Calculation:
   $MR = (C \times ppmV \times CFM)/R_g$
   Where: MR = Mass Removed in lb/hr;
   C = a conversion constant,
   $((60\ min/hr)/(1 \times 10^{-6})(379\ ft^3/lb\text{-}mole)$
   ppmV = parts per million by volume;
   CFM = Cubic Feet per Minute; and
   R_g = ideal gas constant = 379 ft^3/lb-mole
3. Molecular Weight of PCE = 165.85 grams per mole
4. Mass of PCE = 10.9 pounds per gallon.
5. System off for blower servicing between 9/26/93 and 10/26.93.

TABLE 4A: VAPOR CONCENTRATION VERSUS TIME FOR EXTRACTION WELL VEW-5 (CONT.)

Start Date/Time	End Date/Time	Average Concentration (ppm)	Pounds PCE Removed
SYSTEM OFF 7/11/94 THROUGH 7/18/94			
7/18/94 @ 12:15	7/25/94 @ 11:30	6.8	2.75
SYSTEM OFF 7/25/94 THROUGH 8/1/94			
8/1/94 @ 10:45	8/15/94 @ 11:00	6.8	5.44
SYSTEM OFF 8/15/94 THROUGH 8/29/94			
8/29/94 @ 10:00	9/19/94 @	11.3	12.02

Notes:

1. Concentrations measured on a PID calibrated daily to a toluene gas standard.
2. Extraction rate was 95 CFM.
3. Vapor Extraction Removal Rate Calculation:
   $MR = (C \times ppmV \times CFM)/R_g$
   Where: MR = Mass Removed in lb/hr;
   C = a conversion constant,
   $((60\ min/hr)/(1 \times 10^{-6})(379\ ft^3/lb\text{-}mole)$
   ppmV = parts per million by volume;
   CFM = Cubic Feet per Minute; and
   R_g = ideal gas constant = 379 ft^3/lb-mole
3. Molecular Weight of PCE = 165.85 grams per mole
4. Mass of PCE = 10.9 pounds per gallon.
5. System off for blower servicing between 9/26/93 and 10/26.93.

APPENDIX A

ASI
ANALYTICAL SERVICES, INC.
ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092 • (404) 734-4200
FAX (404) 734-4201 • Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

December 18, 1992

P.O. No. 2494 000 OP
Object Code 1.2026.45

Attention: Mr. Terry Snell

Report No. 39417-1

Sample: Soil, SWMU-49, SO-7-8 Feet, 12/9/92, 8:35am, received 12/9/92

RESULTS

	Result	Detection Limit
Ethylbenzene (mg/kg)(EPA 8260)...............	BDL	0.005
Tetrachloroethene (mg/kg)(EPA 8260)..........	0.033	0.005
Toluene (mg/kg)(EPA 8260)....................	BDL	0.005
Trichloroethene (mg/kg)(EPA 8260)............	BDL	0.005
1,1-Dichloroethene (mg/kg)(EPA 8260).........	BDL	0.005
Vinyl chloride (mg/kg)(EPA 8260).............	BDL	0.010
Xylenes (mg/kg)(EPA 8260)....................	BDL	0.010

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Deier

cc: Mr. Dave Buchalter
(EMCON)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
110 TECHNOLOGY PARKWAY ● NORCROSS, GA 30092 ● (404) 734-4200
FAX (404) 734-4201 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

December 18, 1992

P.O. No. 2494 000 OP
Object Code 1.2026.45

Attention: Mr. Terry Snell

Report No. 39417-2

Sample: Soil, SWMU-49, SO-7-12 Feet, 12/9/92, 8:50am, received 12/9/92

RESULTS

	Result	Detection Limit
Ethylbenzene (mg/kg)(EPA 8260)...............	BDL	0.005
Tetrachloroethene (mg/kg)(EPA 8260)..........	0.18	0.005
Toluene (mg/kg)(EPA 8260)....................	BDL	0.005
Trichloroethene (mg/kg)(EPA 8260)............	BDL	0.005
1,1-Dichloroethene (mg/kg)(EPA 8260).........	BDL	0.005
Vinyl chloride (mg/kg)(EPA 8260).............	BDL	0.010
Xylenes (mg/kg)(EPA 8260)....................	BDL	0.010

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Oliver

cc: Mr. Dave Buchalter
(EMCON)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
110 TECHNOLOGY PARKWAY ● NORCROSS, GA 30092 ● (404) 734-4200
FAX (404) 734-4201 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

December 18, 1992

P.O. No. 2494 0000P
Object Code 1.2026.45

Attention: Mr. Terry Snell

Report No. 39417-3

Sample: Soil, SWMU-49, SO-18-8 Feet, 12/9/92, 9:10am, received 12/9/92

RESULTS

	Result	Detection Limit
Ethylbenzene (mg/kg)(EPA 8260)...............	BDL	0.005
Tetrachloroethene (mg/kg)(EPA 8260)..........	0.029	0.005
Toluene (mg/kg)(EPA 8260)....................	BDL	0.005
Trichloroethene (mg/kg)(EPA 8260)............	BDL	0.005
1,1-Dichloroethene (mg/kg)(EPA 8260).........	BDL	0.005
Vinyl chloride (mg/kg)(EPA 8260).............	BDL	0.010
Xylenes (mg/kg)(EPA 8260)....................	BDL	0.010

BDL - Below Detection Limit

Respectfully submitted,

By: Denise A. Oliver

cc: Mr. Dave Buchalter
(EMCON)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY ● NORCROSS, GA 30092 ● (404) 734-4200

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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

December 18, 1992

P.O. No. 2494 0000P
Object Code 1.2026.45

Attention: Mr. Terry Snell

Report No. 39417-4

Sample: Soil, SWMU-49, SO-18-12 Feet, 12/9/92, 9:28am, received 12/9/92

RESULTS

	Result	Detection Limit
Ethylbenzene (mg/kg)(EPA 8260)................	BDL	0.005
Tetrachloroethene (mg/kg)(EPA 8260)..........	0.068	0.005
Toluene (mg/kg)(EPA 8260).....................	BDL	0.005
Trichloroethene (mg/kg)(EPA 8260)............	0.005	0.005
1,1-Dichloroethene (mg/kg)(EPA 8260).........	BDL	0.005
Vinyl chloride (mg/kg)(EPA 8260).............	BDL	0.010
Xylenes (mg/kg)(EPA 8260)....................	BDL	0.010

BDL - Below Detection Limit

Respectfully submitted,

By: Denise L. Deier

cc: Mr. Dave Buchalter
(EMCON)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
110 TECHNOLOGY PARKWAY ● NORCROSS, GA 30092 ● (404) 734-4200
FAX (404) 734-4201 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

December 18, 1992

P.O. No. 2494 000OP
Object Code 1.2026.45

Attention: Mr. Terry Snell

Report No. 39417-5

Sample: Soil, SWMU-49, SO-8-8 Feet, 12/9/92, 10:55am, received 12/9/92

RESULTS

	Result	Detection Limit
Ethylbenzene (mg/kg)(EPA 8260)................	BDL	0.005
Tetrachloroethene (mg/kg)(EPA 8260)..........	BDL	0.005
Toluene (mg/kg)(EPA 8260)....................	BDL	0.005
Trichloroethene (mg/kg)(EPA 8260)............	BDL	0.005
1,1-Dichloroethene (mg/kg)(EPA 8260).........	BDL	0.005
Vinyl chloride (mg/kg)(EPA 8260).............	BDL	0.010
Xylenes (mg/kg)(EPA 8260)....................	BDL	0.010

BDL - Below Detection Limit

Respectfully submitted,

By: Denise L. Dein

cc: Mr. Dave Buchalter
(EMCON)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY ● NORCROSS, GA 30092 ● (404) 734-4200

FAX (404) 734-4201 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

December 18, 1992

P.O. No. 2494 0000P
Object Code 1.2026.45

Attention: Mr. Terry Snell

Report No. 39417-6

Sample: Soil, SWMU-49, SO-17-8 Feet, 12/9/92, 9:52am, received 12/9/92

RESULTS

	Result	Detection Limit
Ethylbenzene (mg/kg)(EPA 8260)...............	BDL	0.005
Tetrachloroethene (mg/kg)(EPA 8260)..........	BDL	0.005
Toluene (mg/kg)(EPA 8260)....................	BDL	0.005
Trichloroethene (mg/kg)(EPA 8260)............	BDL	0.005
1,1-Dichloroethene (mg/kg)(EPA 8260).........	BDL	0.005
Vinyl chloride (mg/kg)(EPA 8260).............	BDL	0.010
Xylenes (mg/kg)(EPA 8260)....................	BDL	0.010

BDL - Below Detection Limit

Respectfully submitted,

By: [signature]

cc: Mr. Dave Buchalter
(EMCON)

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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FAX (404) 734-4201 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
25 Bonnell Street
Newnan, GA 30264

December 18, 1992

P.O. No. 2494 0000P
Object Code 1.2026.45

Attention: Mr. Terry Snell

Report No. 39417-7

Sample: Soil, SWMU-49, SO-17-12 Feet, 12/9/92, 10:15am, received 12/9/92

RESULTS

	Result	Detection Limit
Ethylbenzene (mg/kg)(EPA 8260)...............	BDL	0.005
Tetrachloroethene (mg/kg)(EPA 8260)..........	0.061	0.005
Toluene (mg/kg)(EPA 8260)....................	BDL	0.005
Trichloroethene (mg/kg)(EPA 8260)............	0.016	0.005
1,1-Dichloroethene (mg/kg)(EPA 8260).........	BDL	0.005
Vinyl chloride (mg/kg)(EPA 8260).............	BDL	0.010
Xylenes (mg/kg)(EPA 8260)....................	BDL	0.010

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Deier

cc: Mr. Dave Buchalter
(EMCON)

ASI ANALYTICAL SERVICES, INC.
ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE • ATLANTA, GEORGIA 30309 • (404) 892-8144
FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: 1.2026.45
PROJECT NAME: Bonnell SWMU-49
CLIENT NAME: William L. Bonnell Company
CLIENT ADDRESS AND PHONE NUMBER: 25 Bonnell Street Newnan GA 30263, 404 254-7690
PROJECT MANAGER: Terry Snell
COPY TO: Dave Buchalter, EMCON S.E.
REQUESTED COMP. DATE: Normal
SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☐ OTHER ____

FOR LAB USE ONLY
LAB#: 39417
LAB #:
PROJECT NO.:
ACK: | VERIFIED:
QUOTE#: | BS:
NO. OF SAMP: | PG: | OF:

ANALYSES REQUESTED: Permit VOCs (8260)

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	Permit VOCs (8260)										LAB ID
1	12/9/92	835			X	So-7-8 feet	1											
2	"	850			X	So-7-12 feet	1											
3	"	910			X	So-18-8 feet	1											
4	"	928			X	So-18-12 feet	1											
5	"	952			X	So-8-8 feet	1											
6	"	952			X	So-17-8 feet	1											
7	"																	
8	"	1015			X	So-17-12 feet	1											

REMARKS:
Permit VOCs:
1,1 dichloroethene
ethyl benzene, PCE,
toluene, TCE,
total xylenes,
vinyl chloride

SAMPLED BY AND TITLE: D Goodrich	DATE/TIME: 12/9/92 11AM	RELINQUISHED BY: D M Goodrich	DATE/TIME: 12/9/92
RECEIVED BY:	DATE/TIME:	RELINQUISHED BY:	DATE/TIME:
RECEIVED BY:	DATE/TIME:	RELINQUISHED BY:	DATE/TIME:
RECEIVED BY LAB:	DATE/TIME: 12/9/92 1:14	SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____	AIR BILL #:

HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
COC | (ICE) Yes
ANA REQ | TEMP
CUST SEAL | PH
SAMPLE COND.
ENTERED INTO LIMS ____ COC REVIEWD ____

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
110 TECHNOLOGY PARKWAY ● NORCROSS, GA 30092 ● (404) 734-4200
FAX (404) 734-4201 ● Federal I.D. #58-1625655

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

September 30, 1993

P.O. No. 13371-OP

Attention: Mr. Terry Snell

Report No. 45549

Sample: Soil, grab, Corrective Action, Project #1.2026.45, DG 91393 (Degreaser Unit), 9/13/93, 10:30pm, received 9/14/93

RESULTS

Volatile Organics (EPA 8260)	Result (ug/kg)	Detection Limit (ug/kg)
Benzene	BDL	500000
Bromobenzene	BDL	1000000
Bromochloromethane	BDL	1000000
Bromodichloromethane	BDL	500000
Bromoform	BDL	500000
Bromomethane	BDL	1000000
n-Butylbenzene	BDL	1000000
sec-Butylbenzene	BDL	1000000
tert-Butylbenzene	BDL	1000000
Carbon tetrachloride	BDL	500000
Chlorobenzene	BDL	1000000
Chloroethane	BDL	500000
Chloroform	BDL	500000
Chloromethane	BDL	1000000
2-Chlorotoluene	BDL	1000000
4-Chlorotoluene	BDL	1000000
Dibromochloromethane	BDL	500000
1,2-Dibromo-3-chloropropane	BDL	1000000
1,2-Dibromoethane	BDL	1000000
Dibromomethane	BDL	1000000
1,2-Dichlorobenzene	BDL	1000000
1,3-Dichlorobenzene	BDL	1000000
1,4-Dichlorobenzene	BDL	1000000

BDL - Below Detection Limit

William L. Bonnell Co. Inc.

Report No. 45549

RESULTS

Volatile Organics (EPA 8260)	Result (ug/kg)	Detection Limit (ug/kg)
Dichlorodifluoromethane	BDL	1000000
1,1-Dichloroethane	BDL	500000
1,2-Dichloroethane	BDL	500000
1,1-Dichloroethene	BDL	500000
cis-1,2-Dichloroethene	BDL	500000
trans-1,2-Dichloroethene	BDL	500000
1,2-Dichloropropane	BDL	500000
1,3-Dichloropropane	BDL	500000
2,2-Dichloropropane	BDL	500000
1,1-Dichloropropene	BDL	500000
Ethylbenzene	BDL	500000
Hexachlorobutadiene	BDL	1000000
Isopropylbenzene	BDL	1000000
p-Isopropyltoluene	BDL	1000000
Methylene chloride	BDL	1000000
Naphthalene	BDL	1000000
n-Propylbenzene	BDL	1000000
Styrene	BDL	500000
1,1,1,2-Tetrachloroethane	BDL	500000
1,1,2,2-Tetrachloroethane	BDL	500000
Tetrachloroethene	25000,000	500000
Toluene	BDL	500000
1,2,3-Trichlorobenzene	BDL	1000000
1,2,4-Trichlorobenzene	BDL	1000000
1,1,1-Trichloroethane	BDL	500000
1,1,2-Trichloroethane	BDL	500000
Trichloroethene	1900,000	500000
Trichlorofluoromethane	BDL	500000
1,2,3-Trichloropropane	BDL	1000000
1,2,4-Trimethylbenzene	BDL	1000000
1,3,5-Trimethylbenzene	BDL	1000000
Vinyl chloride	BDL	1000000
m+p-Xylene	BDL	500000
o-Xylene	BDL	500000

BDL - Below Detection Limit

Respectfully submitted,

By: Denise S. Tlier

cc: Mr. Dave Buchalter
EMCON SE

ASI ANALYTICAL SERVICES, INC.
ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
390 TRABERT AVENUE • ATLANTA, GEORGIA 30309 • (404) 892-8144
FAX (404) 892-2740 • Federal I.D. # 58-1625655

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: 1.2026.45
PROJECT NAME: Corrective Action
CLIENT NAME: William C. Boswell Co.
PROJECT MANAGER: T.D. Swell
COPY TO: D. Goodrich & D. Buchacter Eikson S.E.
REQUESTED COMP. DATE: Normal
SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA X OTHER ____
CLIENT ADDRESS AND PHONE NUMBER: P.O. Box 428 Newnan, GA. 30264 404-253-2020

FOR LAB USE ONLY
LAB# 45549
LAB #
PROJECT NO.
ACK | VERIFIED
QUOTE# | BS
NO. OF SAMP 1 | PG 1 | OF 1

STA NO.	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	ANALYSES REQUESTED: EPA 8260 VOC	LAB ID	REMARKS
PG 1393	9/13/93	10:30am		X	X	Degreaser Unit	1	X		

SAMPLED BY AND TITLE: DM Goodrich, P.G.	DATE/TIME: 9/14/93 1:55pm	RELINQUISHED BY: DM Goodrich	DATE/TIME: 9/14/93 2pm
RECEIVED BY: Joe Cowis	DATE/TIME: 9/14/93 2:00pm	RELINQUISHED BY: Joe Cowis 9-14-93	DATE/TIME: 9-14-93 3:00pm
RECEIVED BY: [illegible]	DATE/TIME: 9/14/93 3:00pm	RELINQUISHED BY: [illegible] 9-14-93	DATE/TIME: 4:00 pm
RECEIVED BY LAB: Caldwell	DATE/TIME: 9/14/93	SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____	AIR BILL #

HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
COC ✓ | ICE X
ANA REQ | TEMP 5°C
CUST SEAL NONE | PH
SAMPLE COND. GOOD

REMARKS: Rec. iced 9/14/93 5°C

ENTERED INTO LIMS ______ COC REVIEWD ______

FINAL CLOSURE PROCEDURES
FORMER PCE/TCE DEGREASING UNIT
SOLID WASTE MANAGEMENT UNIT 49
(JULY 1998 THROUGH AUGUST 1998)

Prepared for

THE WILLIAM L BONNELL COMPANY, INC.
25 Bonnell Street
Newnan, Georgia 30264

January 2000

Prepared by

Thomas W. Watson, Inc.
110 Dartmouth Avenue
Avondale Estates, Georgia 30002

PROCEDURES FOR FINAL CLOSURE
SOLID WASTE MANAGEMENT UNIT 49
FORMER PCE/TCE DEGREASING UNIT
(JULY 1998 THROUGH AUGUST 1998)

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PROCEDURES FOR FINAL CLOSURE
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FORMER PCE/TCE DEGREASING UNIT
(JULY 1998 THROUGH AUGUST 1998)

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SOLID WASTE MANAGEMENT UNIT 49
FORMER PCE/TCE DEGREASING UNIT
(JULY 1998 THROUGH AUGUST 1998)

LIST OF FIGURES

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PROCEDURES FOR FINAL CLOSURE
SOLID WASTE MANAGEMENT UNIT 49
FORMER PCE/TCE DEGREASING UNIT
(JULY 1998 THROUGH AUGUST 1998)

LIST OF FIGURES

PROCEDURES FOR FINAL CLOSURE SOLID WASTE MANAGEMENT UNIT 49 FORMER PCE/TCE DEGREASING UNIT (JULY 1998 THROUGH AUGUST 1998)

I certify under penalty of law that this report dated January 24, 2000 and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Terry D. Snell, P. E.
Manager Environmental
The William L Bonnell Company, Inc.

1/20/2000
Date

PROCEDURES FOR FINAL CLOSURE
SOLID WASTE MANAGEMENT UNIT 49
FORMER PCE/TCE DEGREASING UNIT
(JULY 1998 THROUGH AUGUST 1998)

I certify that I am a qualified groundwater scientist who has received a baccalaureate and post-graduate degree in geology, and have sufficient training and experience in groundwater hydrology and related fields, as demonstrated by state registration and completion of accredited university courses, that enable me to make sound professional judgements regarding groundwater monitoring and contaminant fate and transport. I further certify that this report was prepared by myself or by a subordinate working under my direction.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

THOMAS W. WATSON ★ GEORGIA REGISTERED PROFESSIONAL GEOLOGIST ★ No. 577

Thomas W. Watson, P. G.
Senior Geologist
Thomas W. Watson, Inc.

1/20/2000
Date

SECTION 1
INTRODUCTION

1.0 INTRODUCTION

In 1993, The William L Bonnell Company, Inc. (Bonnell) began corrective action measures to remediate the area of the former PCE/TCE degreasing unit located inside the main building. Figure 1, Site Location Map shows the general location of the facility. Figure 2, Location of Former Degreasing Unit, shows the general location of the area within the plant. The unit was last used in the 1950s, and was the likely source of the PCE plume seen at the site today. The PCE/TCE degreasing unit was designated Solid Waste Management Unit 49 (SWMU 49) in the 1993 RCRA Facility Assessment. A soil vapor extraction system (SVE) was installed in 1993, and Bonnell continues to operate the SVE system. A summary of remedial activities conducted at this unit, and shutdown procedures, are contained in this document. A detailed discussion of remediation conducted on the former PCE/TCE degreasing unit, including detailed shutdown procedures for the SVE system is contained in "Feasibility and Corrective Action Plan, The William L Bonnell Company, Inc.," prepared in March 1993, and revised in July 1997.

Analytical testing of soil vapors and soil conducted in 1998 indicates that the SVE system has reached a point where decrease of VOCs in the subsurface as a function of time has become asymptotic. Bonnell is suggesting that the SVE system be discontinued.

1.1 BACKGROUND

Remediation initiated in 1993 consisted of cutting and removing concrete from the plant floor; testing and probing to determine the full extent of the area impacted by the degreasing unit; and excavation of contaminated soil. Excavation was conducted down to undisturbed soil. Contaminated soils were mixed with sand to increase permeability, and returned to the excavation. The unit is inside the plant, in an actively-used area. Further excavation would have proven extremely disruptive to plant operations, and would have created a health hazard to employees.

A SVE unit was installed to remediate soil contamination remaining in the subsurface. The system consists of 6 vapor extraction wells designated VEW-1 through VEW-6. Wells VEW-1 through VEW-4 are outside the area of the original PCE degreaser, and anodizing tank, and were installed with a hand auger. VEW 5 and 6 were installed in the excavation prior to backfilling. Depth of the wells is 13 feet below floor level. Ground water level in this area is approximately 16 feet below land surface. VEW-5 is the vapor extraction point. VEW-6 is a soil gas monitoring point. Figure 3 shows the locations of the vapor extraction wells, and the outline of the former anodizing pit. The system has a 2-hp blower capable of producing 100 CFM at 20 inches of water. All of the vapor extraction wells are screened from 3 feet to 13 feet below land surface, with 20-slot screen.

The highest concentration of vapors detected in the excavation (PID calibrated to toluene) was 1,470 ppm. The concentration of extracted vapors from the VES decreased from 557 ppm to 1 ppm between August 2, 1993 and Sept 19, 1994.

From 1993 to the present, Bonnell monitored soil gasses entering and leaving the SVE system, and adjusted operating times to maximize VOC removal. At present, the system operates 8 hours per week from 8 a. m. to 5 p. m. on Tuesdays.

SECTION 2
SYSTEM SHUTDOWN CRITERIA

2.0 SHUTDOWN CRITERIA

Shutdown of the system is defined in three phases according to the PCE Degreaser CAP & Vapor Extraction System Design Report (EMCON, November 1994):

2.1 SOIL GAS SAMPLING OF THE ENTIRE SYSTEM

The system will operate until VOC concentrations in the offgas discharged from the vacuum pump, prior to carbon filtration, are reduced to less than 2 percent of the initial offgas concentrations. For SWMU-49, this value is 10 ppm. If the reduced concentration remains the same or decreases after five days, the first criterion will have been satisfied, and the SVE system can be temporarily shut down.

2.2 SOIL GAS SAMPLING, INDIVIDUAL WELLS

Vapor concentration readings in the individual VEWs will be measured immediately after shutdown and again at two-day intervals for a ten-day period. This will allow for vapor diffusion and vapor equilibrium to be reestablished. If the vapor concentration remains at 10 ppm or below at each monitoring point over the ten-day period, the system will remain shut down and the second criterion will have been satisfied.

2.3 SOIL SAMPLING

When the second criterion has been met, verification soil samples will be collected at five locations, at depths of five and ten feet, adjacent to each monitoring point (VEW-1, 2, 3, 4, and 6). Sampling procedures are specified by ASTM. If concentrations in the soil samples are below the PCE cleanup goal of 50 ppb, the cleanup will be considered completed.

SECTION 3
SAMPLING PROCEDURES

3.0 Soil Gas Sampling of the Entire System

On June 6, 1997, Analytical Services, Inc. (ASI) collected soil gas samples from the system by placing clean gas sampling bags over sampling ports located near the untreated air inlet, the treated air outlet, and midway between the activated carbon canisters. The results were presented to EPD in the semi-annual report dated September 1997. Lab results indicated that the untreated air (that is, soil vapors under the plant) contained 5 ppb of tetrachlroethene. Trichloroethene was below detection levels (<2 ppb). At that time, a decision was made to allow the system to run for an additional year. Results of this sampling event are included as Table 1. Copies of all laboratory analytical printouts and sample custody records are included in Appendix A.

On July 7, 1998, to initiate the final closure procedure, samples of the untreated soil gas were obtained, again by placing a clean gas sampling bag over the sample port prior to carbon filtration. The gas sample was immediately transported to ASI for analysis for permit VOCs. The same testing was repeated on July 13, 1998, as prescribed in Phase1, above. The results of these tests are shown in Table 2.

3.1 Off Gas Sampling, Individual Recovery Wells

The results indicated that Bonnell could proceed with the second phase of soil gas testing per Phase 2 above. The second phase consisted of shutting the system down, and collecting gas samples from each of the VEWs used as monitoring points. Samples were to be collected immediately after shutdown, and at two day intervals for a ten day period. For this sampling, individual wells were isolated from the system using the ball valves provided in the initial system design. The system vacuum pump was used to extract the sample from each well in turn. Samples from wells VEW-4 and VEW-6 were collected using a small portable vacuum pump. Each well was evacuated for 5 minutes prior to sample collection.

Analytical results of this sampling process are shown on Table 3. The results indicate that the second shutdown criterion had been achieved, and prompted soil sampling to establish the levels of VOCs remaining adhered to the soil.

3.2 SOIL SAMPLING

Soil samples were collected at 5 feet and 10 feet below land surface. Bonnell used a concrete coring saw to cut a hole in the floor of the building. Each soil sampling location was within 18 inches of the vapor extraction well. A hydraulic drive point sampling unit mounted on a small all-terrain vehicle was used to collect the soil samples. The sampling unit pushed a drive point to the desired depth, and a soil core was gathered at the prescribed intervals. Soil samples were gathered using a disposable En Core™ Sampler designed to meet the sampling protocol required by SW 846 for Method 5035 Field Sampling Guide. The samples were sealed in the sample collection device, which was in-turn, sealed in a small plastic bag provided by the lab. The samples were kept in a cooler on ice, and delivered to ASI for analysis.

SECTION 4
DISCUSSION OF RESULTS

The results indicate that soils at the ten foot level are all lower than clean-up standards of 50 parts per billion. At the five-foot interval, samples from VEW-1, VEW-2, VEW-4, and VEW-6 exceed the 50 ppb target. The soil sample from the five-foot interval of VEW-3 was BDL. Soil sample results are shown in Table 4. Locations of the sampling points and associated analytical results are shown on Figures 4 and 5. These results are consistent, and indicate that the SVE system was more effective at the ten-foot depth than at the five-foot interval. Bonnell suggests that the shallow soils were probably compacted prior to construction, and that compaction may have interfered with air circulation.

Although some minor areas of contamination remain, the remediation was successful in greatly reducing the levels of VOCs in the subsurface to levels that are now asymptotic with respect to time.

SECTION 5
CONCLUSIONS AND RECOMMENDATIONS

5.0 Conclusions

Bonnell suggests that the SVE operation at SWMU 49 is complete. Groundwater impact in the vicinity has been virtually eliminated. Analyses of groundwater samples collected from monitor well MW-40D, immediately downgradient of the former PCE/TCE degreaser, are shown in Table 5. These results indicate that levels of PCE in the groundwater declined sharply to near background levels in the time since the remediation of the site began. Levels of offgasses from the current SVE system have become asymptotic with respect to time, as indicated by the initial soil gas samples collected in 1997 and 1998.

In addition, Bonnell is conducting an aggressive monitoring and remediation plan site wide. Based on that and the results as discussed above, Bonnell proposes to shut down the SVE and to continue monitoring groundwater in MW 40D. If changes in groundwater quality indicate that SWMU is an active source of PCE contamination, additional remediation can be evaluated.

5.1 Recommendations

Bonnell is recommending closure of SWMU 49, with no further corrective action beyond monitoring of the area with existing monitoring wells.

TABLES

Table 1. Soil Gas Samples, Entire System, Collected 6/10/97
All Results in Parts per Billion (ppb)

Sample Location	PCE*	TCE
Inlet (Untreated)	5	BDL
Middle (Between carbon cannisters)	BDL	BDL
Exhaust (Treated)	BDL	BDL

*Detection limits = 2 ppb

Target reduction levels to initiate soil sampling = 10,000 ppb

Table 2. Untreated Soil Gas Samples, Entire System, July, 1998
All Results in Parts per Billion (ppb)

Analyte	7/7/98	7/13/98
1,1-Dichloroethene	BDL	BDL
Ethylbenzene	BDL	BDL
Tetrachloroethene	5*	23*
Trichloroethene	BDL	BDL
Toluene	BDL	BDL
Xylenes	BDL	BDL
Vinyl Chloride	BDL	BDL

BDL= Below detection limits
Detection limits for xylenes is 5 ppb. All others are 2 ppb.
*** Target reduction levels to initiate soil sampling = 10,000 ppb.**

Table 3. Soil Gas Samples, Individual Vapor Extraction Wells
All Results in Parts per Billion (ppb)

	VEW-1	VEW-2	VEW-3	VEW-4	VEW-5	VEW-6
7/22/98						
Tetrachloroethene	16	17	14	14	8	BDL
Trichloroethene	2	2	BDL	3	BDL	BDL
7/24/98						
Tetrachloroethene	16	12	17	22	7	BDL
Trichloroethene	2	BDL	2	3	BDL	BDL
7/27/98						
Tetrachloroethene	20	15	14	25	10	BDL
Trichloroethene	3	BDL	2	3	BDL	BDL
7/29/98						
Tetrachloroethene	18	13	16	23	3	BDL
Trichloroethene	3	BDL	2	3	BDL	BDL
7/31/98						
Tetrachloroethene	BDL	5	6	2	3	BDL
Trichloroethene	BDL	BDL	BDL	BDL	BDL	BDL

BDL = Below detection limit
Detection Limit is 2 ppb

Target reduction levels to initiate soil sampling = 10,000 ppb

Table 4. Soil Samples Analytical Results
All Results in Parts Per Billion (ppb)

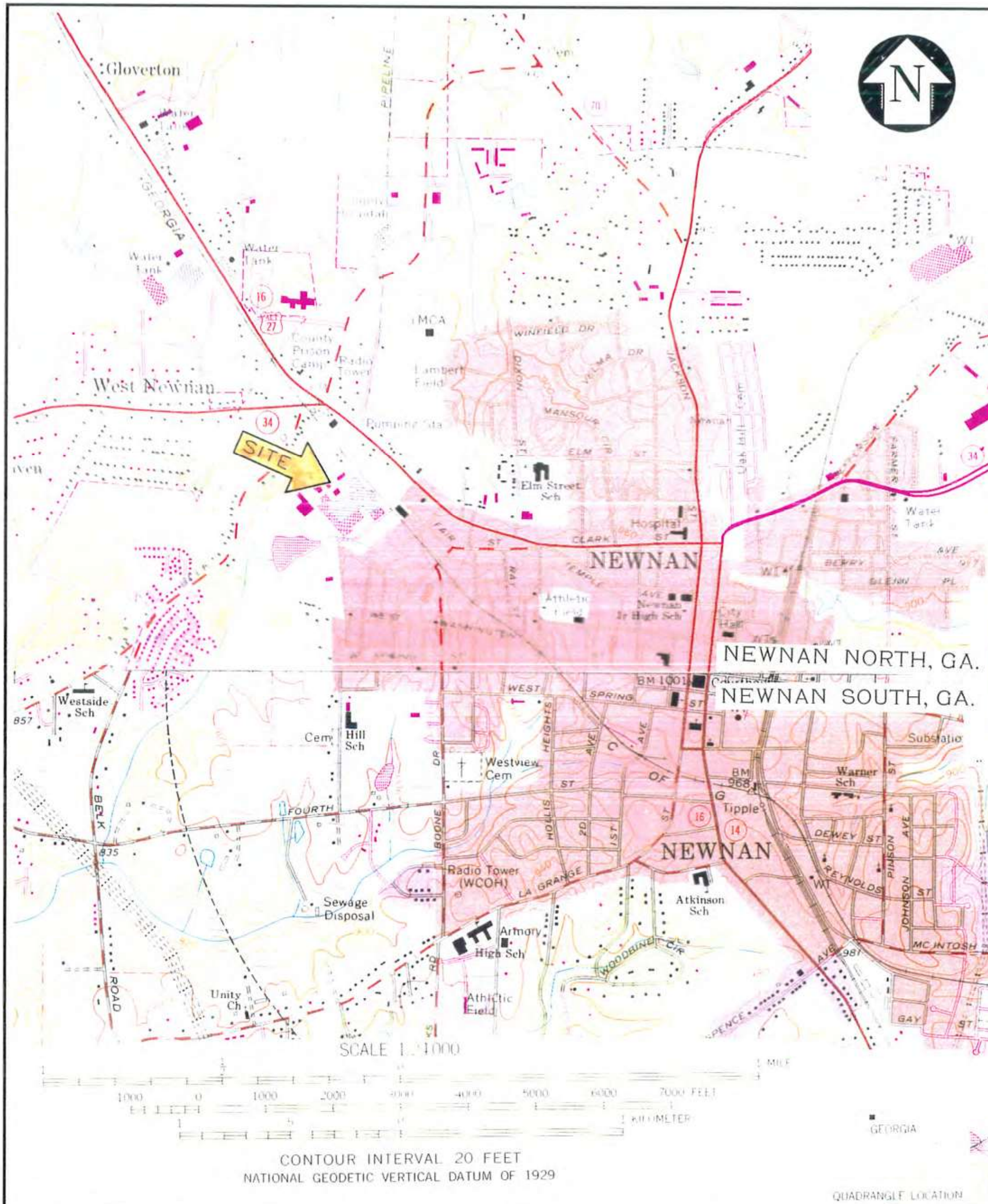
Sample ID	PCE	TCE
VEW-1-5 4 to 6 feet below surface	2600	11
VEW-1-10 8 to 10 feet below surface	5	BDL
VEW-2-5 4 to 6 feet below surface	120	BDL
VEW-2-10 8 to 10 feet below surface	5	BDL
VEW-3-5 4 to 6 feet below surface	BDL	BDL
VEW-3-10 8 to 10 feet below surface	8	BDL
VEW-4-5 4 to 6 feet below surface	240	130
VEW-4-10 8 to 10 feet below surface	27	13
VEW-6-5 4 to 6 feet below surface	210	BDL
VEW-6-10 8 to 10 feet below surface	25	BDL

BDL=Below detection limits
Detection limits are 2 ppb
Samples Collected 8/16/98

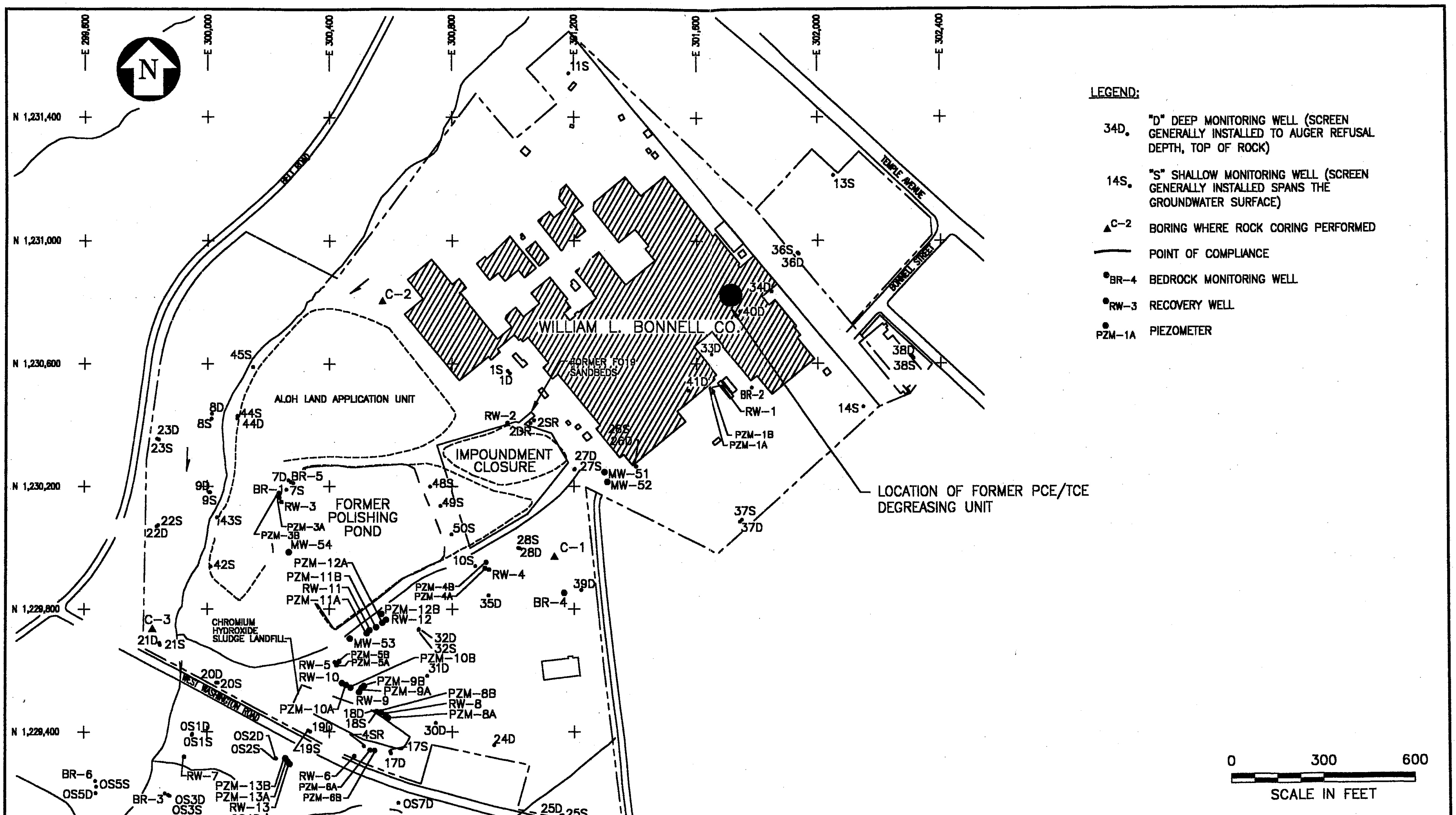
Table 5. Historical Groundwater Samples, MW-40D

Date Sampled	PCE (ug/L)	TCE (ug/L)
6/92	380	34
1/93	480	97
7/93	370	51
1/95	25	<2
12/95	14	3
4/96	14	2
12/96	14	3
12/97	10	2
10/98	9	<2
12/99	8	<2
6/99	9	<2

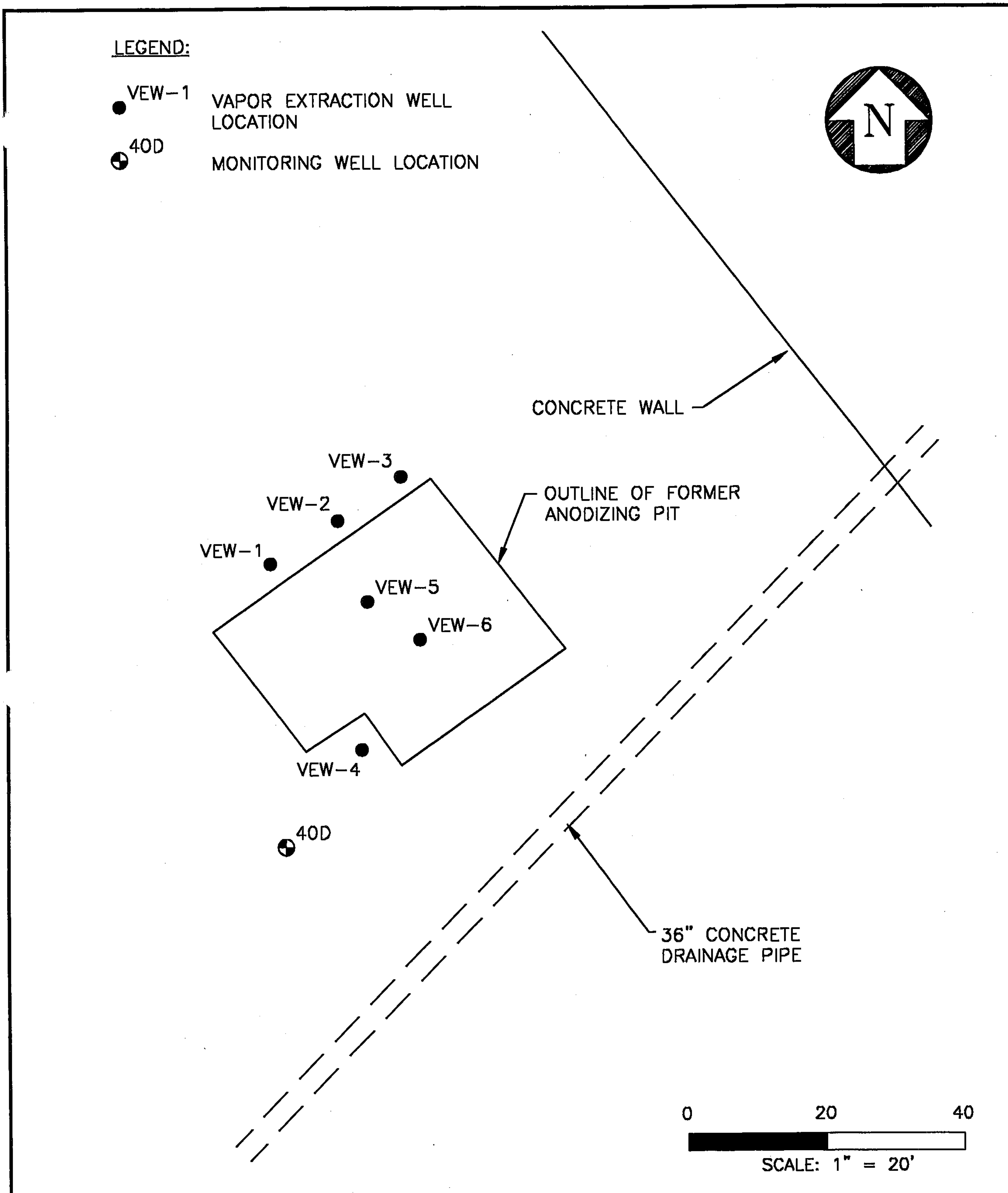
FIGURES



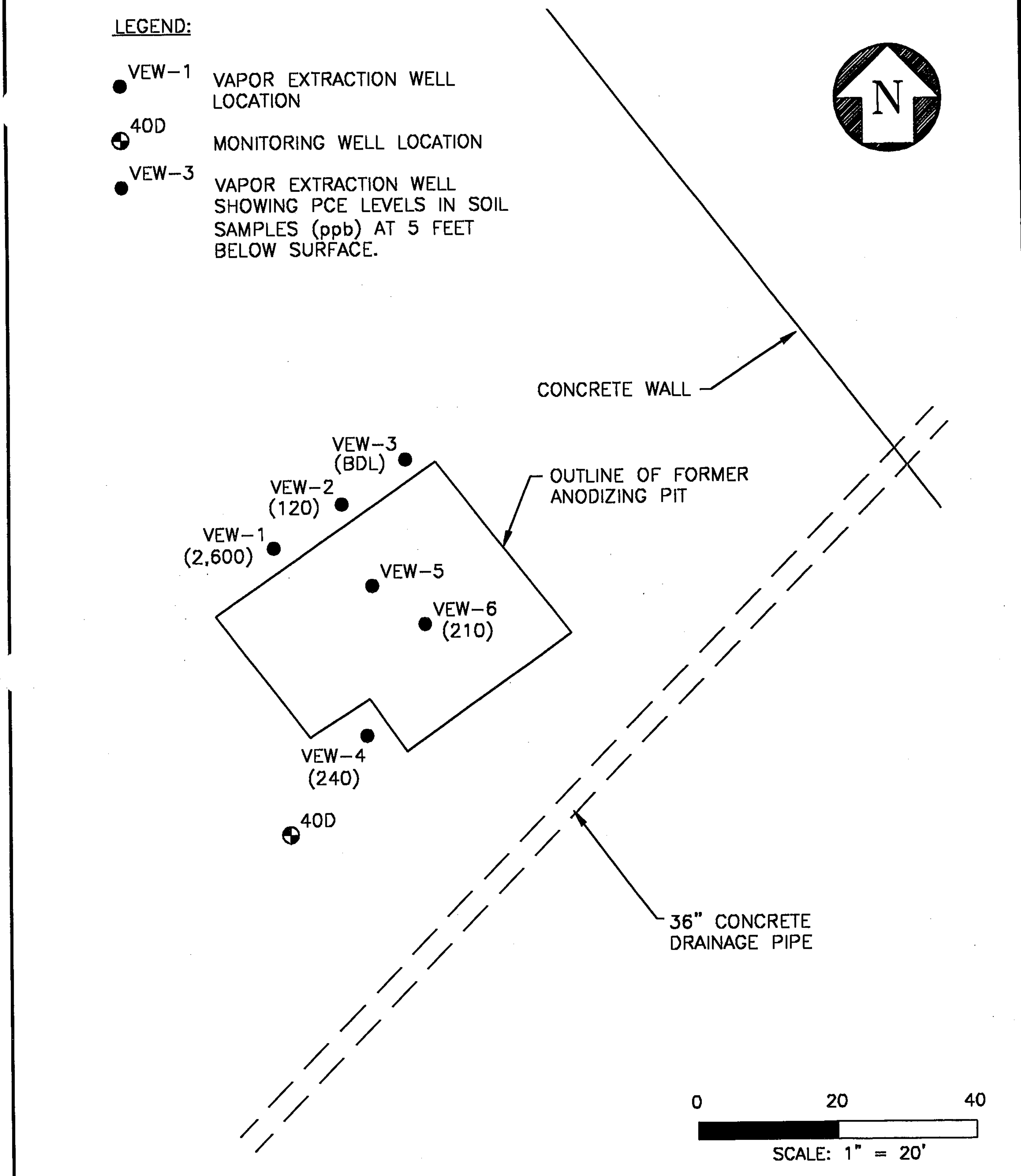
CLIENT: W L BONNELL CO.			SITE LOCATION MAP		
LOCATION: 25 BONNELL STREET					
CITY & STATE: NEWNAN, GA.			DATE: 9/24/97	DRAWING NUMBER: TW97116-01	REV. NO.
TW²,Inc.	DRAWN BY: JL WADE	PREPARED BY:	REVISED:	FIGURE 1	0
	CHECKED BY:	APPROVED BY: TW WATSON	SCALE: AS INDICATED		



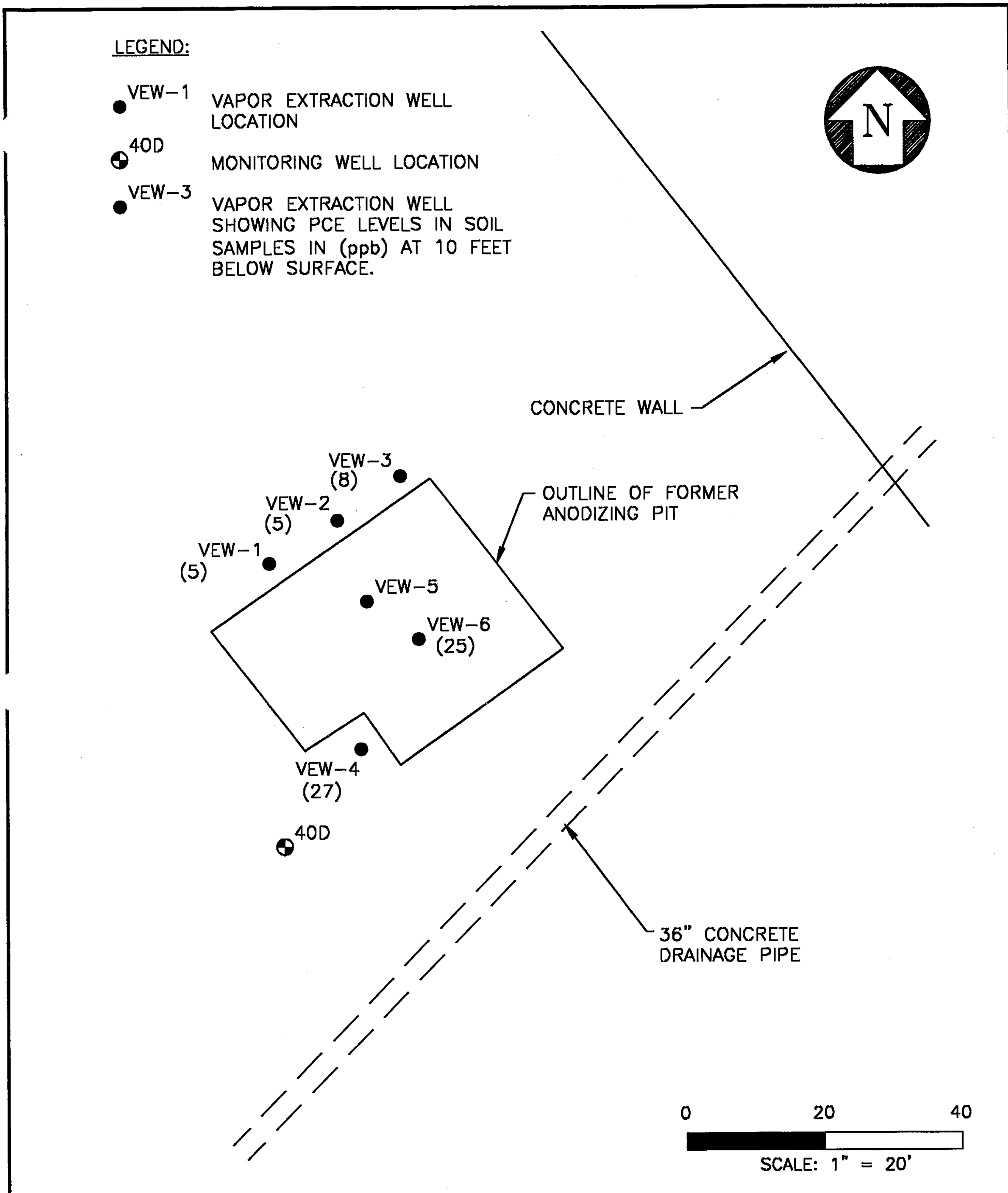
CLIENT: WILLIAM L BONNELL COMPANY			LOCATION OF FORMER DEGREASING UNIT
LOCATION: 25 BONNELL STREET			
CITY & STATE: NEWNAN, GEORGIA			DATE: 1/22/00 — DRAWING NUMBER: TW2000-002 — REV. NO.
TW², Inc.	DRAWN BY: JL WADE	PREPARED BY: TW WATSON	REVISED:
	CHECKED BY:	APPROVED BY:	SCALE: 1"=300' — FIGURE 2 — 0



CLIENT: THE WILLIAM L BONNELL COMPANY	FORMER PCE/TCE DEGREASING UNIT LOCATIONS OF VAPOR EXTRACTION WELLS
BONNELL STREET	
NEWNAN, GEORGIA	FILE NAME: SWMU49 CLOSURE FIGURE 3 NEWNAN GW 981125
TW²,Inc. — DRAWN BY: JL WADE; PREPARED BY:; CHECKED BY:; APPROVED BY:	DATE: 11/22/98; SCALE: 1"=20' — FIGURE 3 — REV. NO. 0



CLIENT: THE WILLIAM L BONNELL COMPANY			FORMER PCE/TCE DEGREASING UNIT LOCATIONS OF VAPOR EXTRACTION WELLS	
BONNELL STREET				
NEWNAN, GEORGIA			FILE NAME: SWMU49 CLOSURE FIGURE 4 NEWNAN GW 981125	REV. NO.
TW²,Inc.	DRAWN BY: JL WADE	PREPARED BY:	DATE: 11/22/98	FIGURE 4 — 0
	CHECKED BY:	APPROVED BY:	SCALE: 1"=20'	



CLIENT: THE WILLIAM L BONNELL COMPANY
BONNELL STREET
NEWNAN, GEORGIA

FORMER PCE/TCE DEGREASING UNIT
LOCATIONS OF VAPOR EXTRACTION WELLS

FILE NAME: SWMU49 CLOSURE FIGURE 5 NEWNAN GW 981125

TW²,Inc.	DRAWN BY: JL WADE	PREPARED BY:	DATE: 11/22/98	FIGURE 5	REV. NO. 0
	CHECKED BY:	APPROVED BY:	SCALE: 1"=20'		

APPENDIX A

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

June 24, 1997

P.O. No. 230411-OP

Report No. 83911-1

Attention: Mr. Terry Snell

Sample Description

Air, grab, Soil Gas Remediation System - SWMU #49, Inlet Port, 06/10/97, 13:47, received 06/10/97

RESULTS

Volatile Organics (EPA 8260)	Result (mg/m>3)	Detection Limit (mg/m>3)
Trichloroethene..............................	BDL	2
Tetrachloroethene............................	5	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

June 24, 1997

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

P.O. No. 230411-OP

Report No. 83911-3

Attention: Mr. Terry Snell

Sample Description

Air, grab, Soil Gas Remediation System - SWMU #49, Connecting Port, 06/10/97, 13:51, received 06/10/97

RESULTS

Volatile Organics (EPA 8260)	Result (mg/m>3)	Detection Limit (mg/m>3)
Trichloroethene..............................	BDL	2
Tetrachloroethene............................	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

June 24, 1997

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

P.O. No. 230411-OP

Report No. 83911-2

Attention: Mr. Terry Snell

Sample Description

Air, grab, Soil Gas Remediation System - SWMU #49, Exhaust Port, 06/10/97, 13:44, received 06/10/97

RESULTS

Volatile Organics (EPA 8260)	Result (mg/m>3)	Detection Limit (mg/m>3)
Trichloroethene..............................	BDL	2
Tetrachloroethene............................	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

CHAIN OF C ODY RECORD

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
110 TECHNOLOGY PA /AY • NORCROSS, GA 30092
(770) 734-420 FAX (770) 734-4201

CLIENT NAME: William L. Bowen Co.

CLIENT ADDRESS AND PHONE NUMBER: 770/254-7690
P.O. Box 428 Newnan, GA 30264

PROJECT MANAGER: Terry D. Snell

COPY TO (if applicable): Tom Watson

REQUESTED COMPLETION DATE: NORMAL

SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☐ OTHER ____

PROJECT NAME: Soil GAS Remediation System - SWMU #49

PROJECT NUMBER:

PURCHASE ORDER NO.:

FOR LAB USE ONLY
LAB # 83911
PROJECT NO.
ACK | VERIFIED
QUOTE # | BS
NO. OF SAMP 3 | PG 1 | OF 1

ANALYSES REQUESTED: PCE and TCE

SAMPLE ID	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	PCE and TCE	LAB ID	REMARKS/ADDITIONAL INFORMATION
1	6/10	1347		X		INLET PORT	2	2	1	
2	6/10	1344		X		Exhaust Port	2	2	2	
3	6/10	1351		X		Connecting Port	2	2	3	

SAMPLED BY AND TITLE: M. Bell / D. Morgan ASI — DATE/TIME: 6/10/97 See Above
RELINQUISHED BY: [signature] — DATE/TIME: 6/10/97 1631
RECEIVED BY: — DATE/TIME:
RELINQUISHED BY: — DATE/TIME:
RECEIVED BY: — DATE/TIME:
RELINQUISHED BY: — DATE/TIME:
RECEIVED BY LAB: [signature] — DATE/TIME: 6/10/97 1630
SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____
AIR BILL #

HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
COC ✓ | ICE no
ANA REQ | TEMP ambient
CUST SEAL no | PH n/a
SAMPLE COND. good

REMARKS: No Field Services Charge!

ENTERED INTO LIMS ____ COC REVIEWD ____

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

July 10, 1998

Attention: Mr. Terry Snell

Report No. 96939

Sample Description

Air, grab, SWMU 49, 980707(OFFGAS1), 07/07/98, 15:05, received 07/07/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	5	2
Trichloroethene	BDL	2
Toluene	BDL	2
Xylenes	BDL	2
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson

ASI ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

CHAIN OF CUSTODY RECORD

CLIENT NAME: W. L. Bonnell

CLIENT ADDRESS AND PHONE NUMBER: Newnan, GA

PROJECT MANAGER: T. D. Snell

COPY TO (if applicable): T. Watson

REQUESTED COMPLETION DATE: 48 hr.

SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☐ OTHER ____

PROJECT NAME: SWMU 49

PROJECT NUMBER:

PURCHASE ORDER NO.:

FOR LAB USE ONLY

LAB # 96939

PROJECT NO.:

ACK | VERIFIED

QUOTE # | BS

NO. OF SAMP 1 | PG 1 | OF 1

SAMPLE ID	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	ANALYSES REQUESTED: PERMIT VOCs **	LAB ID	REMARKS/ADDITIONAL INFORMATION
*	7/7/98	1505		X			1			* 980707 NEWN SWMU49 OFFGAS1
										** Permit VOCs
										1-1 dichloroethylene
										ethylbenzene, PCE
										TCE, toluene, xylenes
										vinyl chloride

SAMPLED BY AND TITLE: Tom Watson — DATE/TIME: 7/7/98 1505

RELINQUISHED BY: Tom Watson — DATE/TIME: 7/7/98 1712

RECEIVED BY: — DATE/TIME:

RELINQUISHED BY: — DATE/TIME:

RECEIVED BY: — DATE/TIME:

RELINQUISHED BY: — DATE/TIME:

RECEIVED BY LAB: S Gooch — DATE/TIME: 7/7/98 1712

SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____

AIR BILL #

HAZWRAP/NEESA Y N

QC LEVEL 1 2 3

COC ✓ | ICE no

ANA REQ | TEMP ambient

CUST SEAL no | PH N/A

SAMPLE COND. good

ENTERED INTO LIMS ____ COC REVIEWD ____

REMARKS: 1 cont.

ASI

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

July 15, 1998

Attention: Mr. Terry Snell

Report No. 97142

Sample Description

Air, grab, SWMU 49, 980713(OFFGAS2), 07/13/98, 10:50, received 07/13/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	23	2
Trichloroethene	BDL	2
Toluene	BDL	2
Xylenes	BDL	5
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson

ASI ANALYTICA SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

CHAIN OF CUSTODY RECORD

CLIENT NAME: BONNELL

CLIENT ADDRESS AND PHONE NUMBER: NEWNAN, GA 770-254-7690

PROJECT MANAGER: T. D. SHELL

COPY TO (if applicable): T. WATSON

REQUESTED COMPLETION DATE: 48 hr

SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☒ OTHER ____

PROJECT NAME: SWMU 49

PROJECT NUMBER:

PURCHASE ORDER NO.:

FOR LAB USE ONLY

LAB # 97142	
PROJECT NO.	
ACK	VERIFIED
QUOTE #	BS
NO. OF SAMP 1	PG 1 OF 1

ANALYSES REQUESTED: PERMIT VOCS **

SAMPLE ID	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	PERMIT VOCS **	LAB ID	REMARKS/ADDITIONAL INFORMATION
*	7/13/98	1050		✓		soil gas, vapor extraction system	1			* 980713 NEWN SWMU 49 OFFGAS 2

REMARKS/ADDITIONAL INFORMATION (cont.):
** PERMIT VOC's
1-1 dichloroethylene
ethylbenzene, PCE
TCE, toluene, xylenes
vinyl chloride

SAMPLED BY AND TITLE: [signature]	DATE/TIME 7/13/98. 1050	RELINQUISHED BY: [signature]	DATE/TIME 7/13/98 1344
RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME
RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME
RECEIVED BY LAB: Jen Phillips	DATE/TIME 7/13/98 13:44	SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____	AIR BILL #

HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
COC
ICE NO
ANA REQ
TEMP ambient
CUST SEAL NO
PH N/A
SAMPLE COND.

REMARKS

ENTERED INTO LIMS ______ COC REVIEWD ______

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

July 30, 1998

Attention: Mr. Terry Snell

Report No. 97513-3

Sample Description

Air, grab, 980722NEWN SWMU 49 Closure, VEW-1 OFFGAS, 07/22/98, 11:05, received 07/22/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	16	2
Trichloroethene	2	2
Toluene	BDL	2
Xylenes	BDL	5
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson

A Unit of American Analytical Services, Inc.

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

July 30, 1998

Attention: Mr. Terry Snell

Report No. 97513-4

Sample Description

Air, grab, 980722NEWN SWMU 49 Closure, VEW-2 OFFGAS, 07/22/98, 11:20, received 07/22/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	17	2
Trichloroethene	2	2
Toluene	BDL	2
Xylenes	BDL	5
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

July 30, 1998

Attention: Mr. Terry Snell

Report No. 97513-5

Sample Description

Air, grab, 980722NEWN SWMU 49 Closure, VEW-3 OFFGAS, 07/22/98, 11:35, received 07/22/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	14	2
Trichloroethene	BDL	2
Toluene	BDL	2
Xylenes	BDL	5
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

July 30, 1998

Attention: Mr. Terry Snell

Report No. 97513-1

Sample Description

Air, grab, 980722NEWN SWMU 49 Closure, VEW-4 OFFGAS, 07/22/98, 10:17, received 07/22/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	14	2
Trichloroethene	3	2
Toluene	BDL	2
Xylenes	BDL	5
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

July 30, 1998

Attention: Mr. Terry Snell

Report No. 97513-6

Sample Description

Air, grab, 980722NEWN SWMU 49 Closure, VEW-5 OFFGAS, 07/22/98, 12:10, received 07/22/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	8	2
Trichloroethene	BDL	2
Toluene	BDL	2
Xylenes	BDL	5
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

cc: Mr. Tom Watson

Project Manager

Quality Assurance

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

July 30, 1998

Attention: Mr. Terry Snell

Report No. 97513-2

Sample Description

Air, grab, 980722NEWN SWMU 49 Closure, VEW-6 OFFGAS, 07/22/98, 10:35, received 07/22/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	BDL	2
Trichloroethene	BDL	2
Toluene	BDL	2
Xylenes	BDL	5
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

cc: Mr. Tom Watson

Project Manager

Quality Assurance

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

July 30, 1998

Attention: Mr. Terry Snell

Report No. 97513-7

Sample Description

Air, grab, 980722NEWN SWMU 49 Closure, Field Blank, 07/22/98, 12:15, received 07/22/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	BDL	2
Trichloroethene	BDL	2
Toluene	BDL	2
Xylenes	BDL	5
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson

ASI ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

CHAIN OF CUSTODY RECORD

CLIENT NAME: BONNELL

CLIENT ADDRESS AND PHONE NUMBER: NEWNAN

PROJECT MANAGER: T.D. SNELL

COPY TO (if applicable): T. WATSON

REQUESTED COMPLETION DATE: 5 DAY T.A.

SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☒ OTHER ____

PROJECT NAME: SWMU 49 CLOSURE

PROJECT NUMBER:

ANALYSES REQUESTED: PERMIT VOCS *

PURCHASE ORDER NO.

FOR LAB USE ONLY: LAB # / PROJECT NO. / ACK / VERIFIED / QUOTE # / BS / NO. OF SAMP / PG / OF

SAMPLE ID	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	PERMIT VOCS *	LAB ID	REMARKS/ADDITIONAL INFORMATION
	7/22/98	1017		✓		Soil Gas	1	✓		980722NEWNSWMU 49 CLOSURENEW-4 OFFGAS
	7/22	1035		✓		"	1	✓		980722NEWNSWMU 49 CLOSURE NEW6 OFFGAS
	7/22	1105		✓		"	1	✓		980722NEWNSWMU 49 CLOSURE NEW-1 OFFGAS
	"	1120		✓		"	1	✓		980722NEWNSWMU 49 CLOSURE NEW-2 OFFGAS
	"	1135		✓		"	1	✓		980722NEWN SWMU 49 CLOSURENEW3 OFFGAS
	"	1210		✓		"	1	✓		980722NEWNSWMU 49 CLOSURE NEW5 OFFGAS

SAMPLED BY AND TITLE: [signature] DATE/TIME: 7/22/98 1700

RELINQUISHED BY: [signature] DATE/TIME: 7/22/98 1545

RECEIVED BY: DATE/TIME:

RELINQUISHED BY: DATE/TIME:

RECEIVED BY: DATE/TIME:

RELINQUISHED BY: DATE/TIME:

RECEIVED BY LAB: [signature] DATE/TIME: 7/22/98 15:45

SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____

AIR BILL #

HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
COC ✓ ICE no
ANA REQ TEMP ambient
CUST SEAL no PH n/a
SAMPLE COND.

ENTERED INTO LIMS ____ COC REVIEWD ____

REMARKS: 1-1 dichloroethylene, ethylbenzene, PCE, TCE, toluene, Xylene, Vinyl chloride

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

July 30, 1998

Attention: Mr. Terry Snell

Report No. 97640-4

Sample Description

Air, grab, 980724NEWN SWMU 49 Closure, VEW1 OFFGAS, 07/24/98, 11:15, received 07/24/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	16	2
Trichloroethene	2	2
Toluene	BDL	2
Xylenes	BDL	5
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

cc: Mr. Tom Watson

Project Manager

Quality Assurance

ASI

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

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(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

July 30, 1998

Attention: Mr. Terry Snell

Report No. 97640-3

Sample Description

Air, grab, 980724NEWN SWMU 49 Closure, VEW2 OFFGAS, 07/24/98, 10:55, received 07/24/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	12	2
Trichloroethene	BDL	2
Toluene	BDL	2
Xylenes	BDL	5
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

cc: Mr. Tom Watson

Project Manager

Quality Assurance

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

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(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

July 30, 1998

Attention: Mr. Terry Snell

Report No. 97640-2

Sample Description

Air, grab, 980724NEWN SWMU 49 Closure, VEW3 OFFGAS, 07/24/98, 10:35, received 07/24/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	17	2
Trichloroethene	2	2
Toluene	BDL	2
Xylenes	BDL	5
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

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(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

July 30, 1998

Attention: Mr. Terry Snell

Report No. 97640-6

Sample Description

Air, grab, 980724NEWN SWMU 49 Closure, VEW4 OFFGAS, 07/24/98, 11:40, received 07/24/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	22	2
Trichloroethene	3	2
Toluene	BDL	2
Xylenes	BDL	5
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

July 30, 1998

Attention: Mr. Terry Snell

Report No. 97640-1

Sample Description

Air, grab, 980724NEWN SWMU 49 Closure, VEW5 OFFGAS, 07/24/98, 10:15, received 07/24/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	7	2
Trichloroethene	BDL	2
Toluene	BDL	2
Xylenes	BDL	5
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

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(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

July 30, 1998

Attention: Mr. Terry Snell

Report No. 97640-5

Sample Description

Air, grab, 980724NEWN SWMU 49 Closure, VEW-6 OFFGAS, 07/24/98, 11:30, received 07/24/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	BDL	2
Trichloroethene	BDL	2
Toluene	BDL	2
Xylenes	BDL	5
Vinyl chloride	BDL	2

BDL - Below Detection Limit

cc: Mr. Tom Watson

Respectfully submitted,

Project Manager

Quality Assurance

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

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(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

July 30, 1998

Attention: Mr. Terry Snell

Report No. 97640-7

Sample Description

Air, grab, 980724NEWN SWMU 49 Closure, Field Blank, 07/24/98, 11:45, received 07/24/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	BDL	2
Trichloroethene	BDL	2
Toluene	BDL	2
Xylenes	BDL	5
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

cc: Mr. Tom Watson

Project Manager

Quality Assurance

ASI ANALYTICA SERVICES, INC.
ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

CHAIN OF CUSTODY RECORD

CLIENT NAME: BONNELL

CLIENT ADDRESS AND PHONE NUMBER: NEWNAN

PROJECT MANAGER: T. D. SNELL

COPY TO (if applicable): T. WATSON

REQUESTED COMPLETION DATE: 5 DAY TA

SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☒ OTHER ____

PROJECT NAME: SWMU 49 CLOSURE

PROJECT NUMBER:

ANALYSES REQUESTED: PERMIT VOCS — VOCs per past 1,1 DCE, Ethyl Benzene, PCE, TCE, Toluene, Xylenes, Vinyl Chloride

PURCHASE ORDER NO.:

FOR LAB USE ONLY — LAB # 97640; PROJECT NO.:; ACK:; VERIFIED:; QUOTE #:; BS:; NO. OF SAMP 7; PG 1 OF 1

SAMPLE ID	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	LAB ID	REMARKS/ADDITIONAL INFORMATION
1	7/24/98	1015		X		SOIL GAS	1	-1	980724NEWNSWMU49 CLOSURE VEW5OFFGAS
2	"	1035		X		"	1	-2	980724NEWNSWMU49 CLOSURE VEW3 OFFGAS
3	"	1055		X		"	1	-3	980724NEWNSWMU49 CLOSURE VEW2OFFGAS
4	"	1115		X		"	1	-4	980724NEWNSWMU49 CLOSURE VEW1 OFFGAS
5	"	1130		X		"	1	-5	980724NEWNSWMU49 CLOSURE VEW-6 OFFGAS
6	"	1140		X		"	1	-6	980724NEWNSWMU49 CLOSURE VEW4 OFFGAS
7	"	1145		X		AMBIENT AIR	1	-7	980724NEWNSWMU49 CLOSURE FIELDBLANKGAS

SAMPLED BY AND TITLE: Tom Watson — DATE/TIME: 7/24/98

RELINQUISHED BY: Tom Watson — DATE/TIME: 7/24/98 1518

RECEIVED BY: — DATE/TIME:

RELINQUISHED BY: — DATE/TIME:

RECEIVED BY: — DATE/TIME:

RELINQUISHED BY: — DATE/TIME:

RECEIVED BY LAB: [signature] — DATE/TIME: 7/24/98 1515

SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____

AIR BILL #

REMARKS

HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
COC ✓
ANA REQ
CUST SEAL No
SAMPLE COND.
ICE No
TEMP ambient
PH NA

ENTERED INTO LIMS ____ COC REVIEWD ____

ASI

ANALYTICAL SERVICES, INC.

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(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

August 12, 1998

Attention: Mr. Terry Snell

Report No. 97693-1

Sample Description

Air, grab, 970272 NEWN SWMU 49 Closure, VEW-1 OFFGAS, 07/27/98, 10:45, received 07/27/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	20	2
Trichloroethene	3	2
Toluene	BDL	2
Xylenes	BDL	5
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson
Thomas W. Watson, Inc.

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

August 12, 1998

Attention: Mr. Terry Snell

Report No. 97693-2

Sample Description

Air, grab, 970272 NEWN SWMU 49 Closure, VEW-2 OFFGAS, 07/27/98, 11:05, received 07/27/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	15	2
Trichloroethene	BDL	2
Toluene	BDL	2
Xylenes	BDL	5
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson
Thomas W. Watson, Inc.

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

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(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

August 12, 1998

Attention: Mr. Terry Snell

Report No. 97693-3

Sample Description

Air, grab, 970272 NEWN SWMU 49 Closure, VEW-3 OFFGAS, 07/27/98, 11:20, received 07/27/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene............................	BDL	2
Ethylbenzene..................................	BDL	2
Tetrachloroethene.............................	14	2
Trichloroethene...............................	2	2
Toluene.......................................	BDL	2
Xylenes.......................................	BDL	5
Vinyl chloride................................	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson
Thomas W. Watson, Inc.

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

August 12, 1998

Attention: Mr. Terry Snell

Report No. 97693-4

Sample Description

Air, grab, 970272 NEWN SWMU 49 Closure, VEW-4 OFFGAS, 07/27/98, 11:30, received 07/27/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	25	2
Trichloroethene	3	2
Toluene	BDL	2
Xylenes	BDL	5
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson
Thomas W. Watson, Inc.

ASI
A N A L Y T I C A L S E R V I C E S , I N C .

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

August 12, 1998

Attention: Mr. Terry Snell

Report No. 97693-5

Sample Description

Air, grab, 970272 NEWN SWMU 49 Closure, VEW-6 OFFGAS, 07/27/98, 11:35, received 07/27/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	BDL	2
Trichloroethene	BDL	2
Toluene	BDL	2
Xylenes	BDL	5
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson
Thomas W. Watson, Inc.

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

August 12, 1998

Attention: Mr. Terry Snell

Report No. 97693-6

Sample Description

Air, grab, 970272 NEWN SWMU 49 Closure, VEW-5 OFFGAS, 07/27/98, 11:40, received 07/27/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	10	2
Trichloroethene	BDL	2
Toluene	BDL	2
Xylenes	BDL	5
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson
Thomas W. Watson, Inc.

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

August 12, 1998

Attention: Mr. Terry Snell

Report No. 97693-7

Sample Description

Air, grab, 970272 NEWN SWMU 49 Closure, Field Blank, 07/27/98, 11:50, received 07/27/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
1,1-Dichloroethene	BDL	2
Ethylbenzene	BDL	2
Tetrachloroethene	BDL	2
Trichloroethene	BDL	2
Toluene	BDL	2
Xylenes	BDL	5
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson
Thomas W. Watson, Inc.

ASI ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

CHAIN OF CUSTODY RECORD

CLIENT NAME: BONNELL

CLIENT ADDRESS AND PHONE NUMBER: NEWNAN

PROJECT MANAGER: T D SNELL

COPY TO (if applicable): T. WATSON

REQUESTED COMPLETION DATE: 5 DAY TA

SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☑ OTHER ____

PROJECT NAME: SWMU 49 CLOSURE

PROJECT NUMBER:

ANALYSES REQUESTED: PERMIT VOCS*

PURCHASE ORDER NO.:

FOR LAB USE ONLY
LAB # 971693
PROJECT NO.:
ACK | VERIFIED
QUOTE # | BS
NO. OF SAMP 7 | PG 1 | OF 1

SAMPLE ID	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	PERMIT VOCS*	LAB ID	REMARKS/ADDITIONAL INFORMATION
1	7/27/98	1045		✓		Soil GAS	1	✓	-1	980727NEWNSWMU49 CLOSUREVEW1 OFFGAS
2	7/27/98	1105		✓		" "	1	✓	-2	980727NEWNSWMU49 CLOSUREVEW2OFFGAS
3	7/27	1120		✓		" "	1	✓	-3	980727NEWNSWMU49 CLOSUREVEW3 ~~SWMU~~ OFFGAS
4	7/27	1130		✓		" "	1	✓	-4	980727NEWNSWMU49 CLOSUREVIEW 4 OFFGAS
5	7/27	11:35		✓		" "	1	✓	-5	980727NEWNSWMU49 CLOSUREVEW6 OFFGAS
6	"	1140		✓		" "	1	✓	-6	980727NEWNSWMU49 CLOSUREVEW5 OFFGAS
7	"	1150		✓		" "	1	✓	-7	980727NEWNSWMU49 CLOSUREFIELDBLANK

SAMPLED BY AND TITLE: T. Watson — DATE/TIME: 7/27/98

RELINQUISHED BY: T. Watson — DATE/TIME: 7/28/98 15:17

RECEIVED BY: — DATE/TIME:

RELINQUISHED BY: — DATE/TIME:

RECEIVED BY: — DATE/TIME:

RELINQUISHED BY: — DATE/TIME:

RECEIVED BY LAB: RJ — DATE/TIME: 7/27/98 15:17

SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____

AIR BILL #:

HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
COC
ANA REQ
CUST SEAL no
SAMPLE COND.
ICE no
TEMP ambient
PH n/a

ENTERED INTO LIMS ____ COC REVIEWD ____

REMARKS: * 1-1 dichloroethylene, ethylbenzene, PCE, TCE, toluene, xylenes, vinyl chloride & cmt

ASI

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ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

August 17, 1998

Attention: Mr. Terry Snell

Report No. 97802-1

Sample Description

Air, grab, 980729 NEWN SWMU 49 Closure, VEW-1 OFFGAS, 07/28/98, 10:10, received 07/30/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
Ethylbenzene	BDL	2
Tetrachloroethene	18	2
Toluene	BDL	2
Trichloroethene	3	2
Xylenes	BDL	5
1,1-Dichloroethene	BDL	2
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

August 17, 1998

Attention: Mr. Terry Snell

Report No. 97802-2

Sample Description

Air, grab, 980729 NEWN SWMU 49 Closure, VEW-2 OFFGAS, 07/28/98, 10:30, received 07/30/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
Ethylbenzene	BDL	2
Tetrachloroethene	13	2
Toluene	BDL	2
Trichloroethene	BDL	2
Xylenes	BDL	5
1,1-Dichloroethene	BDL	2
Vinyl chloride	BDL	2

BDL - Below Detection Limit

cc: Mr. Tom Watson

Respectfully submitted,

Project Manager

Quality Assurance

ASI

A N A L Y T I C A L S E R V I C E S , I N C .

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

August 17, 1998

Attention: Mr. Terry Snell

Report No. 97802-3

Sample Description

Air, grab, 980729 NEWN SWMU 49 Closure, VEW-6 OFFGAS, 07/28/98, 10:35, received 07/30/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
Ethylbenzene	BDL	2
Tetrachloroethene	BDL	2
Toluene	BDL	2
Trichloroethene	BDL	2
Xylenes	BDL	5
1,1-Dichloroethene	BDL	2
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

cc: Mr. Tom Watson

Project Manager

Quality Assurance

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

August 17, 1998

Attention: Mr. Terry Snell

Report No. 97802-4

Sample Description

Air, grab, 980729 NEWN SWMU 49 Closure, VEW-4 OFFGAS, 07/28/98, 10:45, received 07/30/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
Ethylbenzene	BDL	2
Tetrachloroethene	23	2
Toluene	BDL	2
Trichloroethene	3	2
Xylenes	BDL	5
1,1-Dichloroethene	BDL	2
Vinyl chloride	BDL	2

BDL - Below Detection Limit

cc: Mr. Tom Watson

Respectfully submitted,

Project Manager

Quality Assurance

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

August 17, 1998

Attention: Mr. Terry Snell

Report No. 97802-5

Sample Description

Air, grab, 980729 NEWN SWMU 49 Closure, VEW-3 OFFGAS, 07/28/98, 10:50, received 07/30/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
Ethylbenzene	BDL	2
Tetrachloroethene	16	2
Toluene	BDL	2
Trichloroethene	2	2
Xylenes	BDL	5
1,1-Dichloroethene	BDL	2
Vinyl chloride	BDL	2

BDL - Below Detection Limit

cc: Mr. Tom Watson

Respectfully submitted,

Project Manager

Quality Assurance

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

August 17, 1998

Attention: Mr. Terry Snell

Report No. 97802-6

Sample Description

Air, grab, 980729 NEWN SWMU 49 Closure, VEW-5 OFFGAS, 07/28/98, 11:00, received 07/30/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
Ethylbenzene	BDL	2
Tetrachloroethene	3	2
Toluene	BDL	2
Trichloroethene	BDL	2
Xylenes	BDL	5
1,1-Dichloroethene	BDL	2
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

August 17, 1998

Attention: Mr. Terry Snell

Report No. 97802-7

Sample Description

Air, grab, 980729 NEWN SWMU 49 Closure, Field Blank, 07/28/98, 11:15, received 07/30/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
Ethylbenzene	BDL	2
Tetrachloroethene	BDL	2
Toluene	BDL	2
Trichloroethene	BDL	2
Xylenes	BDL	5
1,1-Dichloroethene	BDL	2
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson

ASI ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

CHAIN OF CUSTODY RECORD

CLIENT NAME: BONNELL

CLIENT ADDRESS AND PHONE NUMBER: NEWNAN

PROJECT MANAGER: T. D. Snell

COPY TO (if applicable): T. Watson

REQUESTED COMPLETION DATE: 5 Day T.A.

SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☒ OTHER ____

PROJECT NAME: SWMU 49

PROJECT NUMBER:

PURCHASE ORDER NO.:

FOR LAB USE ONLY: LAB # 97802 | PROJECT NO. | ACK | VERIFIED | QUOTE # | BS | NO. OF SAMP 7 | PG 1 OF 1

ANALYSES REQUESTED: Permit VOCs

SAMPLE ID	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	Permit VOCs	LAB ID	REMARKS/ADDITIONAL INFORMATION
1	7/28/98	1010		X		Soil gas		✓	-1	980729NEWNSWMU49 CLOSURE VEW1 OFFGAS
2	"	1030		X		"		✓	-2	980729NEWNSWMU49 CLOSURE VEW2 OFFGAS
3	"	1035		X		"		✓	-3	980729NEWNSWMU49 CLOSURE VEW6 OFFGAS
4	"	1045		X		"		✓	-4	980729NEWNSWMU49 CLOSURE VEW4 OFFGAS
5	"	1050		X		"		✓	-5	980729NEWNSWMU49 CLOSURE VEW3 OFFGAS
6	"	1100		X		"		✓	-6	980729NEWNSWMU49 CLOSURE VEW5 OFFGAS
7	"	1115		X		"		✓	-7	980729NEWNSWMU49 CLOSURE ~~VEW~~ FIELDBLANK

SAMPLED BY AND TITLE: Tom Watson — DATE/TIME: 7/29/98

RELINQUISHED BY: Tom Watson — DATE/TIME: 7/30/98 1145

RECEIVED BY: — DATE/TIME:

RELINQUISHED BY: — DATE/TIME:

RECEIVED BY: — DATE/TIME:

RELINQUISHED BY: — DATE/TIME:

RECEIVED BY LAB: [signature] Phillips — DATE/TIME: 7/30/98 11:46

SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____

AIR BILL #

HAZWRAP/NEESA Y N | QC LEVEL 1 2 3 | COC ✓ | ANA REQ | CUST SEAL NO | SAMPLE COND. | ICE NO | TEMP ambient | PH N/A

ENTERED INTO LIMS ____ COC REVIEWD ____

REMARKS

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

August 17, 1998

Attention: Mr. Terry Snell

Report No. 97900-1

Sample Description

Air, grab, 980731 Neun SWMU 49 Closure, VEW-1 OFFGAS, 07/31/98, 11:45, received 07/31/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
Ethylbenzene	BDL	2
Tetrachloroethene	BDL	2
Toluene	BDL	2
Trichloroethene	BDL	2
Xylenes	BDL	5
1,1-Dichloroethene	BDL	2
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

August 17, 1998

Attention: Mr. Terry Snell

Report No. 97900-2

Sample Description

Air, grab, 980731 Neun SWMU 49 Closure, VEW-2 OFFGAS, 07/31/98, 12:00, received 07/31/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
Ethylbenzene	BDL	2
Tetrachloroethene	5	2
Toluene	BDL	2
Trichloroethene	BDL	2
Xylenes	BDL	5
1,1-Dichloroethene	BDL	2
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

August 17, 1998

Attention: Mr. Terry Snell

Report No. 97900-3

Sample Description

Air, grab, 980731 Neun SWMU 49 Closure, VEW-3 OFFGAS, 07/31/98, 12:15, received 07/31/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
Ethylbenzene	BDL	2
Tetrachloroethene	6	2
Toluene	BDL	2
Trichloroethene	BDL	2
Xylenes	BDL	5
1,1-Dichloroethene	BDL	2
Vinyl chloride	BDL	2

BDL - Below Detection Limit

cc: Mr. Tom Watson

Respectfully submitted,

Project Manager

Quality Assurance

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

August 17, 1998

Attention: Mr. Terry Snell

Report No. 97900-4

Sample Description

Air, grab, 980731 Neun SWMU 49 Closure, VEW-5 OFFGAS, 07/31/98, 12:30, received 07/31/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
Ethylbenzene..............................	BDL	2
Tetrachloroethene.........................	3	2
Toluene...................................	BDL	2
Trichloroethene...........................	BDL	2
Xylenes...................................	BDL	5
1,1-Dichloroethene........................	BDL	2
Vinyl chloride............................	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

cc: Mr. Tom Watson

Project Manager

Quality Assurance

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

August 17, 1998

Attention: Mr. Terry Snell

Report No. 97900-5

Sample Description

Air, grab, 980731 Neun SWMU 49 Closure, VEW-6 OFFGAS, 07/31/98, 12:32, received 07/31/98

RESULTS

›latile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
Ethylbenzene..................................	BDL	2
Tetrachloroethene.............................	BDL	2
Toluene.......................................	BDL	2
Trichloroethene...............................	BDL	2
Xylenes.......................................	BDL	5
1,1-Dichloroethene............................	BDL	2
Vinyl chloride................................	BDL	2

BDL - Below Detection Limit

cc: Mr. Tom Watson

Respectfully submitted,

Project Manager

Quality Assurance

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

August 17, 1998

Attention: Mr. Terry Snell

Report No. 97900-6

Sample Description

Air, grab, 980731 Neun SWMU 49 Closure, VEW-4 OFFGAS, 07/31/98, 12:35, received 07/31/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
Ethylbenzene	BDL	2
Tetrachloroethene	2	2
Toluene	BDL	2
Trichloroethene	BDL	2
Xylenes	BDL	5
1,1-Dichloroethene	BDL	2
Vinyl chloride	BDL	2

BDL - Below Detection Limit

Respectfully submitted,

cc: Mr. Tom Watson

Project Manager

Quality Assurance

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

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LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

August 17, 1998

Attention: Mr. Terry Snell

Report No. 97900-7

Sample Description

Air, grab, 980731 Neun SWMU 49 Closure, Field Blank, 07/31/98, 12:40, received 07/31/98

RESULTS

Volatile Organics (EPA 8260B)	Result (mg/m>3)	Detection Limit (mg/m>3)
Ethylbenzene	BDL	2
Tetrachloroethene	BDL	2
Toluene	BDL	2
Trichloroethene	BDL	2
Xylenes	BDL	5
1,1-Dichloroethene	BDL	2
Vinyl chloride	BDL	2

BDL - Below Detection Limit

cc: Mr. Tom Watson

Respectfully submitted,

Project Manager

Quality Assurance

ASI ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

CHAIN OF CUSTODY RECORD

CLIENT NAME: Bonnell
CLIENT ADDRESS AND PHONE NUMBER: Newnan
PROJECT MANAGER: T. D. Snell
COPY TO (if applicable): T. Watson
REQUESTED COMPLETION DATE: 5 Day TA
SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☒ OTHER ____
PROJECT NAME: SWMU 49 Close
PROJECT NUMBER:
ANALYSES REQUESTED: Permit VOCs

PURCHASE ORDER NO.:

FOR LAB USE ONLY
LAB # 97900
PROJECT NO.
ACK | VERIFIED
QUOTE # | BS
NO. OF SAMP 7 | PG 1 | OF 1

SAMPLE ID	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	Permit VOCs	LAB ID	REMARKS/ADDITIONAL INFORMATION
1	7/31/98	1145		✓		offgas	1	✓	-1	980731NEWNSWMU49CLOSURE VEW1 OFFGAS
2	"	1200		✓		"	1	✓	-2	980731NEWNSWMU49 CLOSUREVEW2OFFGAS
3	"	1215		✓		"	1	✓	-3	980731NEWNSWMU49 CLOSURE VEW3OFFGAS
4	"	1230		✓		"	1	✓	-4	980731NEWNSWMU49 CLOSURE VEW5 OFFGAS
5	"	1232		✓		"	1	✓	-5	980731NEWNSWMU49 CLOSURE VEW6 OFFGAS
6	"	1235		✓		"	1	✓	-6	980731NEWNSWMU49 CLOSURE VEW4 OFFGAS
7	"	1240		✓		"	1	✓	-7	980731 NEWNSWMU49 CLOSUREFIELDBLANK

SAMPLED BY AND TITLE: T. Watson | DATE/TIME: 7/31/98
RELINQUISHED BY: T. Watson | DATE/TIME: 1529
RECEIVED BY: | DATE/TIME:
RELINQUISHED BY: | DATE/TIME:
RECEIVED BY: | DATE/TIME:
RELINQUISHED BY: | DATE/TIME:
RECEIVED BY LAB: [signature] | DATE/TIME: 7/31/98 15:30
SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____
AIR BILL #
REMARKS

HAZWRAP/NEESA Y N
QC LEVEL 1 2 3
COC | ICE ✓
ANA REQ | TEMP ambient
CUST SEAL NO | PH N/A
SAMPLE COND.
ENTERED INTO LIMS ____ COC REVIEWD ____

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

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(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

September 10, 1998

Attention: Mr. Terry Snell

Report No. 98437-3

Sample Description

Soil, grab, SWMU 49, 980816 Closure VEW 1-5, 4'-6', 08/16/98, 10:40, received 08/17/98

RESULTS

Volatile Organics (EPA 8260B)	Result (ug/kg)	Detection Limit (ug/kg)
Ethylbenzene	BDL	5
Tetrachloroethene	2600	5
Trichloroethene	11	5
Toluene	BDL	5
Xylenes	BDL	5
Vinyl chloride	BDL	5
1,1-Dichloroethene	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

September 10, 1998

Attention: Mr. Terry Snell

Report No. 98437-4

Sample Description

Soil, grab, SWMU 49, 980816 Closure VEW 1-10, 8'-10', 08/16/98, 10:50, received 08/17/98

RESULTS

'olatile Organics (EPA 8260B)	Result (ug/kg)	Detection Limit (ug/kg)
Ethylbenzene	BDL	5
Tetrachloroethene	5	5
Trichloroethene	BDL	5
Toluene	BDL	5
Xylenes	BDL	5
Vinyl chloride	BDL	5
1,1-Dichloroethene	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

September 10, 1998

Attention: Mr. Terry Snell

Report No. 98437-5

Sample Description

Soil, grab, SWMU 49, 980816 Closure VEW 2-5, 4'-6', 08/16/98, 11:00, received 08/17/98

RESULTS

Volatile Organics (EPA 8260B)	Result (ug/kg)	Detection Limit (ug/kg)
Ethylbenzene	BDL	5
Tetrachloroethene	120	5
Trichloroethene	BDL	5
Toluene	BDL	5
Xylenes	BDL	5
Vinyl chloride	BDL	5
1,1-Dichloroethene	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

September 10, 1998

Attention: Mr. Terry Snell

Report No. 98437-6

Sample Description

Soil, grab, SWMU 49, 980816 Closure VEW 2-10, 8'-10', 08/16/98, 11:10, received 08/17/98

RESULTS

olatile Organics (EPA 8260B)	Result (ug/kg)	Detection Limit (ug/kg)
Ethylbenzene	BDL	5
Tetrachloroethene	5	5
Trichloroethene	BDL	5
Toluene	BDL	5
Xylenes	BDL	5
Vinyl chloride	BDL	5
1,1-Dichloroethene	BDL	5

BDL - Below Detection Limit

cc: Mr. Tom Watson

Respectfully submitted,

Project Manager

Quality Assurance

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

September 10, 1998

Attention: Mr. Terry Snell

Report No. 98437-7

Sample Description

Soil, grab, SWMU 49, 980816 Closure VEW 3-5, 4'-6', 08/16/98, 11:30, received 08/17/98

RESULTS

olatile Organics (EPA 8260B)	Result (ug/kg)	Detection Limit (ug/kg)
Ethylbenzene	BDL	5
Tetrachloroethene	BDL	5
Trichloroethene	BDL	5
Toluene	BDL	5
Xylenes	BDL	5
Vinyl chloride	BDL	5
1,1-Dichloroethene	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

cc: Mr. Tom Watson

Project Manager

Quality Assurance

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

September 10, 1998

Attention: Mr. Terry Snell

Report No. 98437-8

Sample Description

Soil, grab, SWMU 49, 980816 Closure VEW 3-10, 8'-10', 08/16/98, 11:40, received 08/17/98

RESULTS

Volatile Organics (EPA 8260B)	Result (ug/kg)	Detection Limit (ug/kg)
Ethylbenzene	BDL	5
Tetrachloroethene	8	5
Trichloroethene	BDL	5
Toluene	BDL	5
Xylenes	BDL	5
Vinyl chloride	BDL	5
1,1-Dichloroethene	BDL	5

BDL - Below Detection Limit

cc: Mr. Tom Watson

Respectfully submitted,

Project Manager

Quality Assurance

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

September 10, 1998

Attention: Mr. Terry Snell

Report No. 98437-1

Sample Description

Soil, grab, SWMU 49, 980816 Closure VEW 4-5, 4'-6', 08/16/98, 09:20, received 08/17/98

RESULTS

Volatile Organics (EPA 8260B)	Result (ug/kg)	Detection Limit (ug/kg)
Ethylbenzene	BDL	5
Tetrachloroethene	240E	5
Trichloroethene	130	5
Toluene	BDL	5
Xylenes	BDL	5
Vinyl chloride	BDL	5
1,1-Dichloroethene	BDL	5

BDL - Below Detection Limit
E - Estimated concentration

cc: Mr. Tom Watson

Respectfully submitted,

Project Manager

Quality Assurance

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

September 10, 1998

Attention: Mr. Terry Snell

Report No. 98437-2

Sample Description

Soil, grab, SWMU 49, 980816 Closure VEW 4-10, 8'-10', 08/16/98, 09:40, received 08/17/98

RESULTS

olatile Organics (EPA 8260B)	Result (ug/kg)	Detection Limit (ug/kg)
Ethylbenzene	BDL	5
Tetrachloroethene	27	5
Trichloroethene	13	5
Toluene	BDL	5
Xylenes	BDL	5
Vinyl chloride	BDL	5
1,1-Dichloroethene	BDL	5

BDL - Below Detection Limit

cc: Mr. Tom Watson

Respectfully submitted,

Project Manager

Quality Assurance

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

September 10, 1998

Attention: Mr. Terry Snell

Report No. 98437-9

Sample Description

Soil, grab, SWMU 49, 980816 Closure VEW 6-5, 4'-6', 08/16/98, 12:03, received 08/17/98

RESULTS

'olatile Organics (EPA 8260B)	Result (ug/kg)	Detection Limit (ug/kg)
Ethylbenzene..	BDL	5
Tetrachloroethene....................................	210E	5
Trichloroethene......................................	BDL	5
Toluene..	BDL	5
Xylenes..	BDL	5
Vinyl chloride.......................................	BDL	5
1,1-Dichloroethene...................................	BDL	5

BDL - Below Detection Limit
E - Estimated concentration

cc: Mr. Tom Watson

Respectfully submitted,

Project Manager

Quality Assurance

ASI

ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

William L. Bonnell Co. Inc.
PO Box 428
Newnan, GA 30264

September 10, 1998

Attention: Mr. Terry Snell

Report No. 98437-10

Sample Description

Soil, grab, SWMU 49, 980816 Closure VEW 6-10, 8'-10', 08/16/98, 12:10, received 08/17/98

RESULTS

Volatile Organics (EPA 8260B)	Result (ug/kg)	Detection Limit (ug/kg)
Ethylbenzene	BDL	5
Tetrachloroethene	25	5
Trichloroethene	BDL	5
Toluene	BDL	5
Xylenes	BDL	5
Vinyl chloride	BDL	5
1,1-Dichloroethene	BDL	5

BDL - Below Detection Limit

Respectfully submitted,

Project Manager

Quality Assurance

cc: Mr. Tom Watson

ASI ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
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CHAIN OF CUSTODY RECORD

CLIENT NAME: Bonnell 1 of 2

CLIENT ADDRESS AND PHONE NUMBER: Newnan GA

PROJECT MANAGER: T. D. Snell

COPY TO (if applicable): T. Watson

REQUESTED COMPLETION DATE: Normal TA

SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☒ OTHER ____

PROJECT NAME: SWMU 49

PROJECT NUMBER:

PURCHASE ORDER NO.:

FOR LAB USE ONLY: LAB #: | PROJECT NO.: | ACK: | VERIFIED: | QUOTE #: | BS: | NO. OF SAMP: | PG: | OF:

ANALYSES REQUESTED: 8260*

SAMPLE ID	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	8260*	LAB ID	REMARKS/ADDITIONAL INFORMATION
VEW 4-5	8/16/98	0920 (1040 struck)		X	X	Soil Sample 4'-6'	4	✓		980816 NEWN SWMU 49 CLOSURE VEW 4-5 SOIL GRAB
VEW 4-10	"	0940		X	X	" " 8'-10'	4	✓		980816 NEWN SWMU 49 CLOSURE VEW 4-10 Soil Grab
VEW 1-5	"	1040		X	X	Soil, 4'-6'	4	✓		980816 NEWN SWMU 49 CLOSURE VEW 1-5 Soil Grab
VEW 1-10	"	1050		X	X	Soil, 8'-10'	4	✓		980816 NEWN SWMU 49 VEW 1-10 Soil Grab
VEW 2-5	"	1100		X	X	Soil, 4'-6'	4	✓		980816 NEWN SWMU 49 Closure VEW 2-5 Soil Grab
VEW 2-10	"	1110		X	X	Soil, 8'-10'	4	✓		980816 NEWN SWMU 49 CLOSURE VEW 2-10 Soil Grab
VEW 3-5		1130		X	X	Soil, 4'-6'	4	✓		980816 NEWN SWMU 49 CLOSURE VEW 3-5 Soil Grab

SAMPLED BY AND TITLE: [signature]	DATE/TIME: 8/16/98	RELINQUISHED BY: [signature]	DATE/TIME: 8/16/98 1047	HAZWRAP/NEESA Y N	QC LEVEL 1 2 3
RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME	COC	ICE
				ANA REQ	TEMP
RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME	CUST SEAL	PH
				SAMPLE COND.	
RECEIVED BY LAB: [signature]	DATE/TIME: 8/17/98 1050	SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____	AIR BILL #		

REMARKS: *ethylbenzene, tetrachloroethene, trichloroethene, toluene, xylenes, vinyl chloride

ENTERED INTO LIMS ____ COC REVIEWD ____

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CHAIN OF CUSTODY RECORD

CLIENT NAME: Bonnell 292

CLIENT ADDRESS AND PHONE NUMBER: Newnan

PROJECT MANAGER: T. D. Snell

COPY TO (if applicable): TW Watson

REQUESTED COMPLETION DATE: Normal TA

SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☒ OTHER ____

PROJECT NAME: Swmu 49

PROJECT NUMBER:

ANALYSES REQUESTED: 8260

SAMPLE ID	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	8260	LAB ID	REMARKS/ADDITIONAL INFORMATION
	8/16/98									
VEW3-10	"	1140		x	x	Soil Sample 8'-10'	4	✓		980816NewnSwmu49 Closure Vew 3-10 Soil Grab
VEW 6-5		1203		x	x	Soil 4'-6'	4	✓		980816NewnSwmu49 Closure VEW 6-5 Soil Grab
VEW 6-10	"	1210		x	x	" 8'-10'	4	✓		980816NewnSwmu49 Closure VEW 6-10 Soil Grab

SAMPLED BY AND TITLE: Tom Watson	DATE/TIME: 8/16/98	RELINQUISHED BY: Tom Watson 8/17/98	DATE/TIME: 1047
RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME
RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME
RECEIVED BY LAB: [signature]	DATE/TIME: 8/17/98 1050	SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____	AIR BILL #

REMA[RKS]: ebenzene, PCE, TCE, toluene, Xylenes, Vinyl chloride, 1,1-dichloroethene

FOR LAB USE ONLY

PURCHASE ORDER NO.

LAB #

PROJECT NO.

ACK | VERIFIED

QUOTE # | BS

NO. OF SAMP | PG | OF

HAZWRAP/NEESA Y N

QC LEVEL 1 2 3

COC | ICE

ANA REQ | TEMP

CUST SEAL | PH

SAMPLE COND.

ENTERED INTO LIMS ____ COC REVIEWD ____

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CHAIN OF CUSTODY RECORD

CLIENT NAME: BONNELL

CLIENT ADDRESS AND PHONE NUMBER: NEWNAN

PROJECT MANAGER: ~~5DAY TA~~ JP SNELL

COPY TO (if applicable): T WATSON

REQUESTED COMPLETION DATE: 5DAY T.A.

SAMPLING REQUIREMENTS: SDWA ☐ NPDES ☐ RCRA ☑ OTHER ____

PROJECT NAME: SWMU CLOSURE

PROJECT NUMBER:

PURCHASE ORDER NO.

FOR LAB USE ONLY

LAB #	
PROJECT NO.	
ACK	VERIFIED
QUOTE #	BS
NO. OF SAMP	PG / OF

ANALYSES REQUESTED: PERMIT VOC'S

SAMPLE ID	DATE	TIME	COMP	GRAB	SOIL	SAMPLE DESCRIPTIONS	# OF CONTAINERS	PERMIT VOC'S	LAB I D	REMARKS/ADDITIONAL INFORMATION
	7/22	1215		✓		Soil GAS	1			980722NEWNAN SWMU 49 CLOSURE FIELD BLANK

SAMPLED BY AND TITLE: TOM WATSON	DATE/TIME: 7/22/98	RELINQUISHED BY: Tom Watson	DATE/TIME: 7/22/98 1545
RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME
RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME
RECEIVED BY LAB: [signature]	DATE/TIME: 7/22/98 15:45	SAMPLE SHIPPED VIA: UPS BUS FED-EX (HAND) OTHER ____	AIR BILL #

HAZWRAP/NEESA Y N
QC LEVEL 1 (2) 3
COC | ICE NO
ANA REQ | TEMP ambient
CUST SEAL NO | PH N/A
SAMPLE COND.

ENTERED INTO LIMS ____ COC REVIEW ____

REMARKS: 1-1 dichloroethylene, ethylbenzene, PCE, TCE, toluene, xylene, Vinyl Chloride