Georgia Department of Natural Resources

Environmental Protection Division • Land Protection Branch
Solid Waste Management Program
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INERT LANDFILL
DESIGN AND OPERATION PLAN

SUPPLEMENTAL DATA FOR SOLID WASTE HANDLING PERMIT

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Much of the following formatting is suggestive. However, adherence can result in more complete D&O plans and will generally help reduce EPD review time.

GENERAL

1. All sheets in the plan should be the same size and have a standard title block
2. Sheet dimensions should be between 24"x30" and 24"x36”
3. The plan should be complete in and of itself, without auxiliary manuals
4. A professional engineer registered to practice in Georgia must stamp and sign all sheets

TITLE SHEET

1. Official site name
2. Table of contents
3. Location map
    a. DOT county map or equivalent
    b. Updated through local reconnaissance
    c. Includes at least a five-mile radius from the site
    d. Direction of stream flow indicated within five-mile radius
4. North arrow
5. Responsible official: Title, address and telephone number
6. Property owner: Name, address and telephone number
7. Consultant: Name, address and telephone number

SITE DESIGN SHEETS MINIMUM REQUIREMENTS

1. Indicate north arrow
2. Scale: 1 inch = 100 feet
3. Contour interval: Two feet unless otherwise approved by EPD
4. Property lines:
    a. Show permitted property lines with bearings and lengths
    b. Include legal description of permitted property boundary
5. Show 100-year floodplain limits
6. Soil boring information to be shown:
    a. Show soil boring locations
    b. Depth to groundwater/refusal
    c. Total boring depth
7. Survey benchmarks:
    a. Show locations of survey benchmarks to be used for site survey control
    b. Provide permanent benchmark detail
8. Limited vehicular access: Show gates, fencing, berms, natural barriers (e.g. forests), etc.
9. Undisturbed buffers:
    a. These areas are to be left in a natural state unless otherwise approved or varied by EPD

    b. In general, no clearing and grubbing are to take place in these areas, except as required for construction of methane monitoring wells and access roads
    c. A minimum of 100 feet between the property line and the disposal area boundary is required
    d. A minimum of 100 feet between any enclosed structures and the disposal area boundary is also required
10. Easements and rights-of-way: If used, letters granting the applicant right of use must be submitted to EPD, and these areas must be designated on the site design sheets.
11. Show drainage structures:
    a. Natural
    b. Constructed: Spring captures, berms, terraces, culverts, headwalls, ditches, French drains, manholes, etc.
12. Disposal area boundaries must be shown
13. Topography:
    a. Extend at least 50 feet beyond property lines
    b. Existing topography: Identify existing physical/land features and previously filled areas
    c. Intermediate topography must be shown on fill sequence drawings
    d. Final topography must be shown
14. Waste disposal areas:
    a. Should show sequence of filling – detailed progression of filling the entire site
    b. Multiple lifts: On a site-specific basis, a separate plan view sheet may be required for each lift. In this case, the final contours of each completed lift will become the initial contours of the subsequent lift.
    c. Lifts: 8 feet nominal, 15 feet maximum
15. Match lines:
    a. On a site-specific basis, the use of match lines may be necessary
    b. Match lines should break at phase boundaries so that a mosaic of two or more sheets need not be constructed for a phase
16. On-site borrow areas
    a. Excavation plan: Show sequence of excavation with initial and final topography
    b. Show temporary and permanent erosion and sedimentation control
17. On-site stockpile areas:
    a. Locate at least 25 feet from the top of constructed side slopes
    b. Topsoil stockpile: For revegetation as upper 6 inches of 2 feet of final cover
    c. Operational stockpile: Minimum 25 cubic yards of soil in addition to topsoil stockpile; this stockpile may be used for fighting on-site fires
    d. Erosion and sediment control
18. Terraces/stormwater diversion berms: Should be used for side slopes longer than 100 feet or rising more than 20 feet in elevation
19. Sediment basins:
    a. Due to the long-term nature of disturbed soil activities at a disposal site, use of a “permanent pool” (3-4 feet in depth) sediment basin is generally the most efficient approach for reducing sediment in stormwater runoff from the site
    b. The basin must be designed to handle both the hydraulic loading for the 25-year, 24-hour storm and the sediment loading from the disturbed area for the life of the site
    c. The basin should be designed and oriented to maximize the effectiveness of the structure
    d. The basin should be separated from a waste disposal area by a minimum 25-foot buffer
20. Methane monitoring points (if applicable):
    a. Permanent marker detail must be shown
    b. If required, methane monitoring well detail identification: MM-1, MM-2…
21. On-site access roads to all phases: Show cross section detail (typical)
22. All weather roads: Show cross section detail (typical)

23. Erosion and sedimentation control: Refer to *Manual for Erosion and Sediment Control in Georgia* published by the State Soil and Water Conservation Committee
24. Directional and informational signs:
    a. Locations
    b. Details
25. Equipment shelter
26. Employee facilities
27. Existing and proposed utilities: Power, gas, water and sewerage lines, phone, cable, etc.
28. Scales (if not included, narrative must describe procedure for estimating weight of waste)

PROFILES AND CROSS-SECTIONS

Conceptual profiles and cross-sections will be necessary for the preliminary design review. However, the location and extent of these sections may require modifications as the facility design progresses. All sections should be chosen to show maximum detail, but should include at a minimum:

1. Vertical scale: 1 inch = 10 feet
2. Horizontal scale: 1 inch = 50 feet
3. Original grade
4. Existing grade, final grade
5. Excavation limits
6. Lift boundaries
7. 3:1 working face
8. Side slope inclinations
    a. Excavated side slopes: 2H:1V maximum
    b. Filled (waste) side slopes: 3H:1V maximum, 33H:1V minimum
9. Locations of intersecting, transverse cross-sections
10. Covers:
    a. Monthly: Minimum 1 foot of clean soil over all exposed waste
    b. Final: 2 feet minimum soil thickness and vegetative cover
11. Construction grades: 2% - 5% for sufficient drainage from each lift and/or fill area

DESIGN & CONSTRUCTION DETAILS

Show details for the following:

1. Sediment basin
2. Downdrains
3. Drainage structures
4. Roadways
5. Survey benchmarks
6. Markers
7. Erosion and sedimentation controls
8. Directional and information signs
9. Other, as needed

DESIGN & CONSTRUCTION DETAILS (NARRATIVE)

1. Description of wastes
2. Volume calculations:

Total volume of waste and cover	cubic yards
Soil volume for cover	cubic yards
Monthly cover	cubic yards
Final cover	cubic yards
Available on-site	cubic yards
Imported	cubic yards

Waste volume		cubic yards
Area of site:	Total	acres
	Usable	acres
Estimated life of site		years

3. Site suitability conditions
4. Controlled unloading of waste
5. Spreading and compaction
6. Monthly cover: Minimum one foot monthly
7. Final cover: Minimum two feet of clean soil on areas at final elevation
8. Fire protection: Minimum 25 cubic yards of soil within 200 feet of working face
9. Supervision
10. Continuity of operation
11. Erosion and sedimentation control: Discuss coordination of clearing and grading activities, installation of temporary/permanent vegetative and structural erosion and sediment control measures, and installation of roads
12. Vegetative plan (SCS, DOT, equivalent)
    a. Intermediate cover: Areas to be exposed for more than three months must be vegetated (or stabilized in accordance with the *Manual for E&S Control*)
    b. Mulching
    c. Temporary vegetation
    d. Final cover: Seeding in accordance with approved schedule to occur within two weeks after cover placement
    e. Borrow areas: Areas to be exposed for more than three months must be vegetated
    f. Temporary/permanent vegetation
    g. Schedule: Planting dates, species, temporary/permanent mix design, lime/fertilizer applications
13. Survey control
14. Site equipment
15. Backup equipment
16. Directional and informational signs
17. Litter control
18. Dust control
19. Operational records/daily logs
20. On-site first aid
21. Site communications
22. Employee facilities

METHANE MONITORING PLAN

A complete methane monitoring plan should be developed in accordance with *EPD Guidance - Methane Gas Monitoring Program*, as most recently amended. *(A variance to this requirement can be requested if no vegetative waste has been, nor will be disposed, at the facility.)*

CLOSURE PLAN

The closure plan must describe the proposed procedures and schedule to close the disposal site in a manner that minimizes the need for further maintenance, and minimizes the risk of post-closure deterioration of the final cover system. At a minimum, closure must consist of:

1. Placement of a compacted layer of clean earth cover not less than two feet in depth over the final lift of waste, not later than one month following placement of solid waste within that lift;
2. Establishment of permanent vegetative cover, and;
3. Grading of the site to drain water from the surface of the site and minimize stormwater flow onto the site to prevent erosion.

The closure plan should include the following:

Typical drawings that depict:
1. Final grades after placement of final cover
2. Minimum and maximum slopes (between 3% and 33%)
3. Drainage structures
4. Erosion and sedimentation control structures and/or practices
5. The sequence of closure over the life of the facility

Discussion:
1. Final cover
2. The sequence and timing of closure during the life of the facility
3. Vegetation methods
4. Source of final cover
5. Equipment needed
6. Sediment basin clean-out
7. Erosion and sedimentation controls
8. Statement that the owner will provide a Construction Quality Assurance (CQA) report and Professional Engineer (P.E.) certification stating that the facility has been closed in accordance with the approved permit

Calculations and cost estimates:
1. Amount of soil necessary for cover
2. Amount of seed, fertilizer, soil conditioners, mulches, etc.
3. A detailed cost estimate based upon third party closure (costs that EPD can reasonably expect to incur if required to hire a contractor to close the facility) that includes, at a minimum, itemized costs for:
    a. Soil cover
    b. Soil transportation, placement and grading
    c. Seed
    d. Fertilizer
    e. Soil conditioners
    f. Mulches
    g. Labor
    h. Drainage structure construction
    i. Final disposition of waste and clean-up, if necessary
    j. Sedimentation basin clean-out
    k. Additional erosion and sedimentation control
    l. CQA services, engineering evaluations, report preparation, and final certification
    m. Conducting a survey and preparing complete legal descriptions of the property boundary and waste disposal boundary
    n. Construction manager to administer closure on behalf of EPD
    o. Any other anticipated closure items

POST-CLOSURE CARE PLAN
The post-closure care plan should describe in detail:

1. The steps necessary to maintain the integrity and effectiveness of the final cover, including making repairs to the cover as necessary to correct the effects of subsidence, erosion, or other issues that might damage the final cover
2. Monitoring and maintenance of methane wells in accordance with the approved methane monitoring plan (if required)

The post-closure care plan should include the following:

Discussion:

1. Post-closure use of the property
2. Methane monitoring schedules (if applicable) and maintenance of monitoring wells
3. Engineering inspections of final cover system
4. Repair and revegetation of damaged final cover areas
5. Revegetation of final cover areas
6. Mowing of vegetative cover
7. Sediment basin maintenance/clean-out
8. Maintenance and repair of drainage structures
9. Equipment needed for post-closure care
10. Limited access
11. Post-closure supervision

Cost estimates:

1. A detailed cost estimate based upon third-party closure (costs that EPD can reasonably expect to incur if required to hire a contractor to close the facility) that includes, at a minimum, itemized annual costs for the above items
2. The cost for an independent construction manager to administer post-closure care on behalf of EPD

FINANCIAL RESPONSIBILITY

All owners and operators of inert waste landfills must provide financial assurance for the estimated closure and post-closure care costs as provided in the Rules for Solid Waste Management, Chapter 391-3-4-.13, including annually increasing the cost estimates for inflation.

SUPPORTING DESIGN DATA

Supporting data may be submitted in a separate document, including but not limited to:

1. Sedimentation basin design calculations
2. Design calculations for drainage ditches, culverts, down drains, and other drainage structures
3. Local government approvals, as necessary