Building Metro Atlanta's Economy by Building Systems to Prevent Erosion

The "Dirt 2" Committee Recommends a Practical, Proven Approach to Keep Mud Out of Streams, Ponds, and Backyards

Construction sites don't have to turn our neighborhood streams brown, fill ponds with mud, ruin clean streams you played in as a child, bury backyards with sediments, and degrade habitat for fish and birds. The people of the Atlanta metropolitan area need no longer tolerate the kind of building practices that have allowed uncounted tons of mud to be scoured from the landscape and flushed into our streams. We now know how to do better—much better—how to build homes and schools, roads and utility corridors, shopping centers, offices, hospitals, and churches without significant erosion, without loosing mud-choked water on downstream homeowners, and without generating the enormous financial and environmental costs that spread with sedimentation.

Owners, builders, and site designers in the Atlanta region have already demonstrated that they can greatly reduce or virtually eliminate the muddy runoff that commonly accompanies excavation and site preparation today. Simply by using proven state-of-practice building techniques, they can dramatically reduce or eliminate all of the costs they now impose on downstream landowners, businesses, the general public, and the environment.

We know what to do to build metro Atlanta's economy while also cleaning our streams and protecting the property values of downstream residents, businesses, and towns. We now have in place the laws and regulations we need to achieve those goals. Those laws by themselves, however, will not transform how builders build. To make that happen, project owners and financiers, residents, business leaders, environmentalists, public-interest advocates, developers, and our elected and appointed public officials will have to expect—and then insist on—construction that does virtually nothing to accelerate the natural process of erosion.

Metro Atlanta—indeed, all of Georgia—should insist on nothing less. There is no reason to tolerate the status quo when we already know what practical steps to take to greatly reduce our costs and clean up our water.

According to news reports and editorials—as well as testimony by our resource agency officials and local government representatives—conventional construction practices in the metro Atlanta region are accelerating erosion and degrading water quality. Citizens and taxpayers see the results in the Chattahoochee and its tributaries after every rain. Despite what many people say, mud does not "just happen." Quite to the contrary, much of the cause of muddy, sand- and silt-laden streams—and resulting significant off-site costs to property owners, businesses, and towns—does result directly from a set of deliberate business choices made by developers and contractors resulting in mud in runoff from regulated construction projects.

For years, almost no one expected that the required "erosion control plans" for developments could actually protect the quality of our

streams. And we've gotten exactly what we expected. This is because too frequently the plans are not integrated into projects, not designed as coherent systems, and not expected to achieve a specified level of performance. In short, the plans are not using state-of-practice erosion control systems and recognized best practices that are now proven able to protect the quality of the state's waters.

In almost every other area of life and business, we expect reliable performance and sound value in the goods and services we purchase. And that could become the case with respect to controlling erosion and restoring and protecting water quality.

To accomplish this paradigm shift, the Erosion and Sedimentation Control Technical Study Committee, otherwise known as "Dirt 2," seeks a complete reorientation of erosion control planning and implementation.

The new paradigm is based on three strategies:

1. **thoughtful integration of erosion control into a construction project,**
2. **thoughtful design of a coherent system of controls by qualified design professionals, and**
3. **monitoring the system to assure performance in protecting water quality.**

This is a bold step away from the current approach with traditional erosion control plans. The current approach is exemplified by selecting control components and "practices" from a list, putting these on paper at minimal cost in compliance with traditional requirements and not inspecting the approved sites afterwards for performance in protecting water quality. The Dirt 2 approach is not rocket science for qualified design professionals. It is simply the state-of-practice in other parts of the nation that have put a higher premium on water quality than we have in metro Atlanta.

A caution is in order: nothing—not even this new paradigm—can fix the situation where a site is simply over-developed, where virtually every square foot is scraped bare. And construction sites are not the only human activities that accelerate erosion and add sediments to our streams and ponds. There are other major unregulated sources of erosion. Dirt 2 deals solely with (1) residential developments, (2) linear projects (including highways and utility corridors), and (3) commercial developments, which are subject to regulation.

Nevertheless, the members of the Dirt 2 committee are excited! The new paradigm will save the region money. It will improve water quality at the same time. It will protect the environment. And it can do that starting now.

Dirt 2's new paradigm produces systems that work. The new paradigm is socially responsible and technically sound; it will protect the legitimate interests of all property owners and other stakeholders; it will ensure that those whose intent is to purchase erosion-control services that perform will get the value and performance they pay for. The approach will help good developers effectively manage their business risk.

And it should greatly increase the basis for trust and respect of all the parties with responsibilities for protecting the quality of the waters of the state.

If the will exists, the change from the failed paradigm to the "new" one can begin right now. There are no significant barriers in the way, no need for more study. Dirt 2 has brought some good news to the table. Now it is up to the public- and private-sector policy-level decision makers to take up the call for action.

We can clean up our water while also reducing the real private and public hard-dollar costs associated with development.

The Committee

In 1993, the Georgia General Assembly created the original "Dirt Committee" chaired by Dr. Jim Kundell to study the impacts of sedimentation on Georgia's waterways. We in Dirt 2 accepted the follow-up charge, in 1996, of determining if it would be technically possible to protect water quality to the full extent that Georgians want and, if so, to see if it could be done "cost effectively."

Dirt 2 has included a variety of credible senior business association representatives, business owners, business and corporate representatives, contractors, design professionals, developers and homebuilders, engineers, environmental advocates, planners, resource scientists, and state and local officials. From the beginning, while having some rather different perspectives, we agreed that the traditional approach had produced much frustration, wasted money, and degraded water quality.

We sponsored cutting-edge technical research and policy analysis by nationally recognized experts. We discovered that the answer to our charge is an emphatic, confident, resounding YES! We can clean up our water while also reducing the real private and public hard-dollar costs associated with development.

We don't base that conclusion on a theory or a model or a wish. We base it on the results of actual construction projects. For example, Dirt 2 participated with the Fulton County Board of Education in the construction of the Big Creek Elementary School in Alpharetta. The project was a demonstration of the practical steps owners, designers, builders, and landowners can take to prevent erosion and control sedimentation for a major high-profile development under challenging site conditions and with intense oversight by the neighborhood, regulators, and effective public-interest advocates. Big Creek showed that the prevailing attitude in the region that "mud happens" is as anachronistic as it is irresponsible. We don't have to keep on settling for gross failure.

We All Pay The Costs When "Mud Happens"

When Dirt 2 set out to consider "cost effectiveness" we quickly confronted some obvious and important questions: Which costs? And to whom? What costs should drive erosion control plans, their implementation, and the resulting quality of the waters of the state?

Dirt 2 members heard people predict that erosion control systems that perform might cost more (in terms of on-site "erosion-control" costs) than traditional plans that are not performance oriented and don't work. We also heard some people say that any on-site costs for erosion control—regardless how small or how cost effective—are too high.

> "Whether the actual loss is closer to $100 million or $200 million, this admittedly crude estimate is a useful reminder that construction activities that degrade ponds and streams impose economic losses on those who have already invested in the area."
>
> *—The National Academy of Public Administration*

Dirt 2 believes that comparison of the "cost" of an erosion prevention and sediment control system that performs—that is, that can be expected to protect off-site water quality—with an "erosion control plan" that doesn't perform is not a valid or meaningful comparison. "Cost effectiveness" is meaningless if something doesn't perform its intended function. We believe the proper purpose of erosion control is to protect the quality of the waters of the state. And "cost" and "cost effectiveness" must not ignore real economic costs to others off-site—as well as needless on-site costs where construction work in progress is damaged due to ineffective erosion control.

The table located on page 8 of this report identifies some of the hard-dollar costs we all bear in

the metro Atlanta region because many developers have failed to prevent development-caused erosion and control sedimentation. We pay to dredge small ponds and larger public water-supply reservoirs. We pay higher electric rates because sediments reduce capacity at hydro-electric facilities and damage equipment. We pay higher fees for water because mud raises the cost of making it fit to drink. We pay in lost recreational opportunities and property values.

We pay—not from our wallets but from our souls—when we gaze into water all across metro Atlanta that should be sparkling and full of life and see instead muddy, horribly impacted streams.

The table is reproduced from a white paper Dirt 2 commissioned from the National Academy of Public Administration. An excerpt from the Academy's report describes how the "mud happens" attitude infringes on our private-property rights. Although the Academy was deliberately very conservative in its assumptions, it nevertheless exposed the outrageous waste and inequity to all caused by sloppy construction and all that facilitates it:

"To get a sense of the order of magnitude of the damage caused by such sedimentation [the existing paradigm], consider that in the 18-county Atlanta metropolitan area, there were some 1.1 million housing units (850,000 of them were owner-occupied), with a median value of $105,000 in 1996. If approximately 5 percent of those units were close to ponds and 10 percent were close to streams or the Chattahoochee itself, the value of some 165,000 properties could be tied to the quality of those waters. At the median value of $105,000 per unit, the total value of those properties would exceed $17.3 billion. If degraded water quality reduced the value of those properties by just 1 percent—knocking down the value of a $105,000 home by $1,050—the total lost property value in the region would be on the order of $173 million…. Whether the actual loss is closer to $100 million or $200 million, this admittedly crude estimate is a useful reminder that construction activities that degrade ponds and streams impose economic losses on those who have already invested in the area."

Committing to Build It Right in Fulton County

A group of Atlanta's site planners, design professionals, and contractors has demonstrated that preventing development-caused or "accelerated" erosion and controlling sediments during construction is not an engineering problem or even much of an extra on-site expense. The approach they employed at the Big Creek Elementary School project in Alpharetta eliminated any damages or costs to downstream property owners. The general approach—the new paradigm—is straightforward, easily replicated, and highly effective. It should become standard throughout metro Atlanta.

The basic but new-to-Georgia approach includes simple technologies built into the Big Creek site such as "seep berms," "floating siphons," and "sand filters." The most important "innovation," however, had less to do with engineering and technology than commitment and intent. The entire team involved at Big Creek was committed from the start to developing a site plan and construction schedule that would work, that effectively integrated the sediment-control system into the project, that would sequence each phase of construction in ways that would minimize the amount of disturbed and erodible soil, and that would make good economic use of the site's existing vegetation. In short, they took a modern "systems approach" to designing and building the school and made erosion prevention a key element of that system.

No surprise: the team achieved what it intended to do. The system worked. For three zones (B1, B2, and B3) including most of the site's disturbed area, new-paradigm systems were designed and installed. No water and no measurable sediments reached the streams from these zones during most of the rainstorms while construction was under way. When some turbidity did reach the streams, it was insignificant compared to current common practice. For one zone (B4), more traditional erosion-control practices were intentionally used for comparison; and the effluent quality reaching the stream was also consistent with common current practice.

Fulton County invested about $12.5-million in building the Big Creek School. Of that, about $3-million went to preparing the site. The general contractor reports that, of that amount, $265,000 paid for the on-site erosion-control work, stabilizing the stream that was severely eroded by prior up-stream development, and a storm-water control that will remain in use once the project is completed. In reality, only $180,000 was spent on Dirt 2-sponsored on-site erosion prevention and sediment control measures. Developers typically expect erosion-control work to account for about 3%-5% of site work costs today. At Big Creek it was 8.5% (or 6% excluding the two items), a nominal increase considering that the Big Creek erosion-prevention and sediment-control plan was a first learning experience and incorporated permanent environmental educational features. Also, the rigorously implemented plan actually performed: it prevented erosion and kept sediments on site, protecting the neighborhood's streams, downstream property owners, and our water quality. Economic costs weren't transferred to others off-site. Also, no job disruptions occurred, work efficiency was increased, and less remobilization to repair erosion damage was required—all reducing on-site costs. And there were no erosion-related phone calls from the community.

And recall that Big Creek was a very high-profile project with challenging site conditions and with intense oversight by the neighborhood, regulators, and effective public-interest advocates—and on an aggressive schedule with limited options. There were real business risks to manage for the owner, and they were effectively managed. In contrast to the past, fines and other negative consequences associated with violation of one's NPDES permit can be substantial. Was it worth the several thousand extra dollars to finish on schedule and on budget with a clean environmental record? We believe it was—but feel free to ask the owner.

The total value of construction in the metro Atlanta area is conservatively estimated at $1-billion to $2-billion per year. If all owners and developers followed Fulton County's example and increased their total (on-site) project costs by even one percentage point, that would require a regional investment of just $10-million to $20-million per year. This begins to offset the large financial costs now transferred to the down-stream users and general public. And net cost savings are possible. Doing the job right will not discourage or dampen development in the metro Atlanta region.

Owners and developers may have to pay slightly more for erosion-prevention systems that actually perform and manage their risk, but any additional on-site costs will be greatly exceeded by the equally real tens or hundreds of millions of dollars saved by off-site or downstream homeowners, towns, businesses, and taxpayers. And net on-site costs may well be reduced.

Most developers in the region still treat erosion prevention and sediment controls as an afterthought, just an on-site expense to be avoided or minimized, and paid without the expectation of any performance. Conventional practice assumes that "mud happens." As long as the developer buys an "erosion control plan" and installs a few basic containment devices from some list or document—silt fences and the like—he has been deemed worthy of a permit. This license to pollute effectively grants permission to transfer his costs to others off-site. That paradigm must now give way to the proven integrated systems performance approach advocated by Dirt 2.

Dirt 2 has worked extensively with site planners, design professionals, and contractors to make them aware of how they can achieve good results like those at Big Creek. Dirt 2 has produced training materials for design professionals including a video, and published reports rich with the information developers, designers, regulators, and contractors need to improve their performance. Developers and public officials will find Dirt 2's Development Guide to Risk Management and Cost Control particularly helpful. Even better would be to consult with the professionals who made the Big Creek Elementary School demonstration project a real winner:

- Collins Cooper Carusi, architects
- Beers-Moody joint venture, general contractor
- VECO, Inc., erosion control installation subcontractor
- Breedlove Land Planning, Inc., site designer

Owners and developers must work together to reduce business risk.

Old Paradigm: Mud Just Happens

- Maximize construction footprint at a site while minimizing the functioning buffers
- Clear the entire site of all vegetation
- Direct all sediment-laden surface flows to one or a few discharge points
- Purchase an “erosion-control plan” (that no one expects to perform) merely to secure a building permit, then implement the plan only as and if forced to do so
- Discharge most or much of eroded soil from “control measures” to streams
- Don’t evaluate performance in protecting off-site streams
- *Expectation and result: mud in the water; increased costs for downstream property owners, businesses, and towns; eroded respect for all those responsible for protecting the quality of the waters of the state*

New Paradigm: Meeting Performance Targets

- Develop erosion prevention and sediment control systems that are expected to perform to specified levels
- Implement and maintain the systems; ensure quality-control by monitoring their performance; adjust them as results indicate to assure value paid for is received
- Clear the site in phases to minimize exposed soils
- Encourage water to soak into the site; discharge water over wider areas through functioning stream buffers and at numerous points
- Use green space buffers; maximize economic use of vegetation on site to trap sediments and water before the treated water leaves the site
- *Result: little or no mud in the water; water quality protected; no costs transferred to off-site downstream private property owners, businesses, and towns; a process that works and a basis for respecting and trusting all involved parties*

Accelerating the Transition to Performance

Because most people assume that mud just "happens"—and because that attitude makes business-as-usual easier for some—changing construction techniques and cleaning up Georgia's streams will take a concerted public and private effort. As long as many developers perceive there to be little or no likelihood of adverse economic consequences to them from not protecting off-site water quality, the failed old paradigm will continue. Market forces will continue to encourage developers to cut corners on environmental protection and transfer large costs to others downstream. This won't change unless the region's leaders—and our public agencies—redirect those forces to consider the rights of and costs to off-site property owners, citizens, businesses, and towns—as well as the quality of our environment.

Dirt 2 has concluded that a suite of public and private actions is in order to accelerate the transition to the proven and cost-effective new paradigm. We make the following recommendations, addressed to each of the players who can make the biggest difference in attaining the public's goals and expectations relative to water quality.

The Environmental Protection Division of the Georgia Department of Natural Resources (EPD):
EPD is responsible for implementing the new federal storm water pollution permit system that applies to all developments in Georgia involving more than five acres of land. That authority gives EPD enormous leverage over how developers will approach erosion prevention and sediment control. EPD needs to do three things to lead and accelerate the transition to performance:

Approve only those EP&SC plans that you expect to perform. Because the systems approach used and demonstrated at Big Creek has redefined the true state-of-practice and what constitutes best practice, insist that all projects use a comparable systems approach that integrates site design, erosion controls, and the sequencing of construction activities. Insist that those plans achieve performance levels that will protect streams and downstream properties.

Enforce the new permits vigorously. The new permit system requires a series of qualified licensed professionals involved in projects to certify that their work complies with the permit and state standards. That system can work efficiently, but only if EPD guarantees its integrity by exposing false certifications and deterring fraud.

Require frequent electronic reporting of monitoring results. The federal permit requires developers to monitor storm water runoff during construction and to report the results monthly to EPD. The permit gives EPD the authority to require more frequent reporting, however, and to specify the format of that reporting. EPD should require developers to post monitoring results on an EPD web page within a day or two of a storm. That nearly instantaneous information would help EPD—and the general public—see which developers and contractors are capable of managing a site and actually protecting the environment and the rights of and property of those downstream. That information should discourage corner cutting and bring economic rewards to developers, designers, and contractors who do a good job.

The Georgia General Assembly:
Strengthen EPD and the economy; reduce the large financial costs now transferred to the general public. EPD can do its job well only if the Georgia Legislature enables it. The Legislature will need to ensure that EPD has the qualified professional staff required to rigorously review the development permit applications and to effectively enforce them on the ground. The Legislature may have to lead the investments in enhanced water-quality monitoring and web-based reporting that will make a performance-driven system work. Ultimately, the Legislature will determine how aggressively EPD pursues cleaner water for Georgians. Because the net cost to developers of improving their performance is so low, and the economic and environmental gains resulting to the general public are so high, the Legislature's choice should be

simple and clear: Be aggressive! Support this win-win-win solution!

Counties, Communities, and State Agencies:
Contract for performance. Government agencies at every level in Metro Atlanta should follow the Fulton County School Board's lead and insist that any public construction project be designed and implemented so that mud doesn't "happen." Government agencies should write their bid specifications to ensure that only competent, committed firms compete, and then write their contracts to reward strong performance and penalize sloppiness or actions that result in failure to perform in protecting water quality.

Site-Designers, Licensed Design Professionals, Contractors, and Owners of Commercial Sites:
Learn the "new" techniques. All those who make a living developing land should learn how simple it is to do the job right, simultaneously protecting the environment, providing better value to their clients, and reducing their own liability exposure. Professional and trade associations should teach the well-recognized state-of-practice design approach and techniques to their members and help EPD expose any irresponsible members who would make the entire industry or profession look bad.

General Public:
Insist on action. No longer tolerate the "mud happens" attitude—from anyone. Let your local and state representatives know that you expect them to lead the transformation to a system of development permits that actually perform and that will reduce the significant dollar costs you and your fellow Georgia citizens and taxpayers end up paying for water, electricity, and municipal services. Protect your property and your property's value. Insist on beauty, on environmental integrity. And if that isn't enough, join the region's public-interest, neighborhood, or environmental organizations that are results-oriented and committed to clean water, a healthy sustainable economy, fairness, and the rights of citizens, consumers, homeowners, and taxpayers.

And, of course, the Governor and the leadership of the business community in the Atlanta metro area can have extraordinary influence by setting the tone and expectations for our resource agencies and for how business is conducted, thereby exerting a significant impact on cleaning up our streams.

The Erosion and Sedimentation Control Technical Study Committee ("Dirt 2")
—Ben Dysart, chair
June 25, 2001

Impact	Approximate costs	Who pays
A. Local Damages		
Dredging small ponds & streams	$1M to $10M per year	Downstream landowners
Replacing inundated turf & shrubbery, landscaping	Probably <$1M per year	Downstream landowners
Property-value loss from degraded streams & ponds (see explanation in text)	$100M	Downstream landowners
B. Basinwide damages		
Dredging large lakes & reservoirs	$1M to $10M per year	Town, county taxpayers
Drinking-water treatment costs	$1M to $5M per year	Water ratepayers
Maintenance at hydroelectric facilities	$1M to $10M per year	Electricity ratepayers
Replacing lost-capacity at hydroelectric facilities	$25M to $50M per year	Electricity ratepayers
Recreation losses	<$1M per year	Recreation businesses & users
Aesthetic loss/muddy water	Unquantified "non-use" value	General population
Ecological damage: reduced or extirpated species	Unquantified "non-use" value	Ecosystem; general population
Ecological damage: potential remediation costs	>$50M	Taxpayers, private benefactors
C. Legal actions		
Damages awarded to downstream victims of sedimentation	$0.5M to $1M per year	Developers & subsequent owners
Stop-work orders (lost productivity)	<$1M per year	Developers & subsequent owners
Construction delays caused by litigation or attempts to stop project	Unknown	Developers & subsequent owners

* These estimates are explained in the Dirt 2 policy analysis produced by NAPA. It would be inappropriate to sum the costs.

For More Information ...

Dirt 2 has commissioned a set of technical papers, practical guides, and policy analyses. Those documents are the foundation upon which this summary report and our recommendations rest. We urge you to read—or watch—them. For copies of the videotape or any of the documents, please call the Chattahoochee-Flint Regional Development Center at 1-770-854-6026 or email at cfrdc@cfrdc.org. All of the written reports are also available on the Department of Natural Resources web site (www.dnr.state.ga.us/dnr/environ) as are links to other useful documents, including: the Georgia Department of Natural Resource's new federal storm water permit for controlling erosion; the Associated Counties of Georgia's "Call for Action"; and the Clean Water Initiative, sponsored by the Metro Atlanta Chamber of Commerce and the Regional Business Coalition.

For a complete list of publications and work products, please see the "Final Products" section of the "Technical Panel Completion Report," published by Dirt 2 in June 2001. The most significant products are:

Policies to Prevent Erosion in Atlanta's Watersheds: Accelerating the Transition to Performance — a white paper by the National Academy of Public Administration, a non-profit, non-partisan public-policy research organization based in Washington, DC, and chartered by Congress to improve governance in America (37 pp)

Erosion Prevention and Sediment Control in Georgia: A Development Guide to Risk Management and Cost Control — a booklet by Dirt 2 produced by Burst Video/Film, Inc. of Atlanta (22 pp)

Getting the Dirt on Clean Streams: Straight Talk on Preventing Erosion — video by Burst Video/Film, Inc. of Atlanta for Dirt 2's outreach effort (9.35 minutes)

Computer Modeling Report —- a report by Dr. Richard Warner of the Surface Mining Institute in Lexington, Ky. (Dr. Warner provided Dirt 2 with recognized state-of-practice computer modeling capabilities which he customized for the soil and other conditions within the Chattahoochee River basin.)

Storm Water, Erosion Prevention, and Sediment Control System: An Example at the Big Creek School Site — a Power Point presentation by Dr. Richard Warner

Design of an Erosion Prevention and Sediment Control System: An Illustration of a Paradigm Shift — a video of Dr. Richard Warner's presentation to design practitioners conducted during the week of February 5, 2001, produced by University of Georgia Center for Continuing Education

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The Dirt 2 Committee was authorized by an act of the Georgia General Assembly in 1993 and supported with a $400,000 grant from a Chattahoochee Basin Downstream Assistance grant authorized by the 1996 General Assembly. The members were appointed by Lt. Governor Pierre Howard. The Chattahoochee-Flint Regional Development Center, based in Franklin, Georgia, administered the grant.

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The Dirt 2 Panel Recommendations for Erosion Prevention and Control