



URS Diamond

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June 16, 2005

Mr. Jim Barber  
 Branch Head – Division of Waste Management  
 North Carolina Department of Environment and Natural Resources (NCDENR)  
 401 Oberlin Road  
 Raleigh, NC 27605

**Construction Certification Report  
 DuPont Kinston Ash Landfill Cap Construction Project  
 Kinston, North Carolina**



Dear Mr. Barber:

This letter report summarizes construction activities associated with the DuPont Kinston Ash Landfill Cap Construction Project, located at the Unifi (formerly DuPont) Kinston Plant (Facility) in Kinston, North Carolina. The construction was performed based on the Design Drawings entitled, *Cap Construction Project, Kinston Ash Landfill, Kinston, North Carolina*, prepared by URS Corporation, dated February 25, 2003, and associated construction documents.

**Background Information**

The Facility is located northeast of Kinston, North Carolina on approximately 650 acres and is bounded by the Neuse River on the south and southeast; North Carolina Highway 11 on the north and northwest; and farmland on the north, northeast, and southwest.

The Kinston Plant began operations in 1953 and continues to manufacture *Dacron*<sup>®</sup> polyester resin and fibers. The Ash Landfill (Site) is located south of the Facility and covers an area of approximately six acres. The Ash Landfill contains the following wastes from the Kinston Plant: coal ash, wastewater sludge, asbestos containing materials (ACM), and miscellaneous debris. The wastewater sludge is located in a pond on the eastern half of the Ash Landfill, and the ACM is located within the ash and is concentrated along the western slope of the Ash Landfill.

The environmental setting of the site is described in detail in the Resources Conservation and Recovery Act (RCRA) Facility Assessment (CH2M-Hill, 1993) and the RCRA Facility Investigation Phase I Report (DuPont CRG, 2000).

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## Scope of Work

The objectives of the construction activities were to:

- ❑ Stabilize the sludge pond for placement of final cover and construction of all cap components.
- ❑ Install a collection and conveyance system for handling of leachate from consolidation of the sludge pond and transport the leachate to the on-site wastewater treatment facility.
- ❑ Regrade the existing slopes to facilitate construction of the cap.
- ❑ Regrade and consolidate ash material under the cap.
- ❑ Install the final cap over the entire Ash Landfill.

The definable features of the project were:

- ❑ Site Preparation, including installation of temporary site facilities and utilities, clearing and grubbing activities, and installation of erosion and sediment (E&S) control measures.
- ❑ Installation of a leachate collection/conveyance system.
- ❑ Consolidation of ash material onto the Ash Landfill.
- ❑ Installation of high strength geotextile over the sludge pond.
- ❑ Placement of consolidated ash material over the installed high strength geotextile as light weight fill.
- ❑ Installation of prefabricated vertical (PV) drains in the sludge pond area.
- ❑ Construction of site access roadways, drainage diversion ditches, sediment traps, and culverts.
- ❑ Installation of final cover, consisting of a minimum 24-inches of soil (cover and amended cover) from the on-site borrow areas.

A site location plan is presented as Drawing SU1.

## Project Participants

The following is a list of the significant participants in the Kinston Ash Landfill Closure Project and a description of their roles in the project:

- ❑ **The Kinston Plant (Facility).** As the Permit Owner, DuPont has overall responsibility for the closure of the Ash Landfill and communication with the NCDENR.
- ❑ **The DuPont Corporate Remediation Group (CRG).** The CRG had overall responsibility for the construction implementation of the Ash Landfill closure. The CRG was responsible for reporting to representatives of the Facility and the North Carolina Department of Environment and Natural Resources (NCDENR).

- **NCDENR.** State regulatory agency. All DuPont reporting during construction was addressed to John Crowder, the Eastern Regional Supervisor from the Wilmington, North Carolina Regional Office.
- **URS – Remediation and Operating Services (URS-ROS),** Willow Grove, Pennsylvania. Construction Contractor. The Construction Contractor (“Contractor”) had overall responsibility for construction and construction quality control in accordance with the Contract Documents.
- **URS Diamond (URSD).** Responsible for field engineering and quality assurance oversight of the project as the DuPont Site Representative (DSR), including providing site personnel and other resources to manage the construction and perform quality assurance responsibilities, maintaining budget and schedule control, and providing complete and timely reporting to the CRG and the Facility representatives.

## **Construction Documents**

The DuPont Kinston Ash Landfill closure plan was prepared by the CRG in accordance with the NCDENR requirements. The construction documents contained the following:

- Detailed technical specifications outlining all construction activities, including site preparation, leachate collection and conveyance systems installation, sludge pond stabilization, and final grading and cover installation.
- Construction drawings, including existing conditions, E&S control plan, sludge pond stabilization, final grading plan, borrow area development, cross-sections, and construction details.
- Identification of all known hazardous substances and/or waste at the landfill.
- Previous investigation information.

The Construction Documents were presented to the NCDENR in March 2003 and approved.

## **Safety**

URS-ROS conducted a Project Safety Analysis (PSA) at the site on September 2, 2003. Representatives from the CRG, URSD, the Facility, and URS-ROS were in attendance. The PSA identified potential physical and chemical hazards associated with the scope of work and outlined plans for eliminating or managing these hazards. A site-specific Health and Safety Plan (HASP) was developed by URS-ROS in accordance with the DuPont safety and health standard operating procedures and in compliance with the requirements set forth in 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response. A site orientation and HASP review were conducted by URS-ROS on September 3, 2003 with representatives from the CRG, URSD, the Facility, and URS-ROS present. Additional site orientations and HASP reviews were conducted as new personnel arrived on-site and for additional stages of construction.

## **Waste Management Plan**

A site-specific Waste Management Plan (WMP) was prepared in accordance with the DuPont waste management standard operating procedures. All waste generated during this project was handled and disposed of in accordance with the WMP.

## **Sequence of Construction**

The following sections provide a description of the construction activities. Construction operations were completed in two stages. Stage 1 was initiated on September 3, 2003, and completed with the Stage 1 ash placement on January 24, 2004. Following Stage 1 construction, there was a demobilization period from January 24 through August 2, 2004, to allow for settlement monitoring over the sludge pond area.

Stage 2 construction operations were initiated on August 2, 2004, and finished with the completion of final cover and seeding on September 25, 2004. Since the Ash Landfill vegetation was not established at this time, the temporary E&S control measures were left in place.

All remaining temporary E&S control measures were removed between March 2 and 7, 2005. All disturbed areas were seeded and mulched. This completed construction associated with the capping of the Ash Landfill.

Quality control reports for the work were completed on a daily basis by the QC contractor. In addition, the QC contractor prepared photographic documentation of certain construction activities, which is located in the CRG files.

## **Pre-construction Meeting**

A pre-construction meeting was held at the Site on September 2, 2003, to review the scope of work and to address any health and safety and construction-related concerns. Representatives from the CRG, URSD, the Facility, and URS-ROS were in attendance and participated. URS-ROS explained construction procedures and sequences, along with quality control (QC) testing methods.

## **Mobilization and Site Preparation**

URS-ROS initiated mobilization of equipment and personnel to the Site on September 3, 2003. A total of 11 personnel, two tracked hydraulic excavators, two bulldozers, a front-end loader, a smooth drum roller with vibratory capability, two construction trailers, and miscellaneous support equipment and supplies were mobilized over the course of the project.

The Site survey, clearing and grubbing operations, E&S controls installation, and installation of other site control structures were performed between September 3 and 24, 2003. Existing conditions surveys of the West Borrow Area, East Borrow Area, and Ash Landfill are presented as Drawings SU2A, SA3A, and SU4A respectively.

During clearing and grubbing operations, a "soft soil area" was discovered at the base of the western slope of the Ash Landfill. Prior to initiating construction of the flattened

slope, the area was reinforced with a geogrid mat. To facilitate drainage of the subgrade as the slope was constructed, a 2-foot thick sand drainage layer was installed directly on top of the geogrid. All cleared and grubbed material was stockpiled in an open field east of the landfill. All E&S controls were installed and approved before major earthwork activities were begun.

URS-ROS encountered several days of down time due to adverse weather conditions. Hurricane Isabel shutdown construction activities from September 16 through 21, 2003. URS-ROS spent September 22 repairing E&S controls and dewatering excavations.

## **Earthworks**

Earthwork operations commenced at the landfill on September 25, 2003, and continued until the demobilization period on January 24, 2004. After remobilization on August 2, 2004, URS-ROS continued with final cover and topsoil placement activities through Stage 2 completion on September 25, 2004. A total of approximately 47,000 cubic yards (yd<sup>3</sup>) of soil were excavated from the two borrow areas (East and West) and placed as cover soil on the Ash Landfill.

At the beginning of the earthwork operations, URS-ROS placed borrow material at the toe of the slope along the eastern and southern ends of the landfill. Borrow material was placed in approximately 1-foot loose lifts and compacted using the smooth drum roller. For safety reasons associated with the slopes of the cap, use of the smooth drum roller was discontinued. Compaction was subsequently achieved using the available on-site earthmoving equipment.

During placement and compaction activities for each lift, the Contractor's QC representative performed nuclear density and moisture content testing. The test results were compared to the requirements of the specifications to verify the compacted condition was satisfactory before an additional lift was constructed. Placement of the borrow material along the slopes continued from the toe of slope to the crest. During the course of borrow material placement along the slopes, URS-ROS consolidated ash material from 'off-cap' areas (areas outside the limits of the permitted Ash Landfill), the existing slopes of the landfill, and areas on top of the landfill. This material was stockpiled and placed as lightweight fill on top of the high-strength (Type 1) geotextile over the sludge pond area.

When the sludge pond area was relatively stable under the initial layer of cover, URS-ROS continued to place borrow material on top of the landfill for the final cover.

When final cover placement was completed, the Contractor used cotton compost to amend borrow material for use as topsoil. This amended cover soil was placed and seeded on the Ash landfill and in disturbed areas adjacent to the landfill.

During the course of the cover soil placement operations, debris was encountered during development of the Original (East) Borrow Area, and it was determined that an additional borrow material source was needed to complete the final cover over the Ash landfill. To address this problem, an additional on-site borrow area was identified and was located

west of the original area. URS-ROS used material from this area (the Western Borrow Area) to complete all earthwork operations required for the closure of the Ash Landfill.

URS-ROS' surveying subcontractor, The East Group, performed layout of contour stakes and was responsible for grade control during all earthwork operations. Daily grade control using these stakes was performed by URS-ROS.

### **Sludge Pond Stabilization**

As previously mentioned, the eastern half of the Ash Landfill contains a wastewater sludge pond. This sludge was in a "jello-like" condition and had essentially zero shear strength. As a result, to safely permit foot traffic or construction equipment to travel over the sludge pond, the area had to be structurally stabilized. The stabilization of the sludge pond area began on October 13, 2003, with the delivery of the high-strength (Type 1) geotextile manufactured by Huesker, Inc. of Gescher, Germany. URS-ROS employed subcontractor Flint Industries (Flint) to perform staging, sewing, and deployment of the high-strength geotextile. Flint staged each panel of prefabricated high-strength geotextile in the sequence provided in the panel layout submittal, then started to assemble the entire geotextile layer by sewing together each adjacent panel continuously in the warp (strong) direction using their industry standard sewing machine. Each seam consisted of double parallel stitches with high-strength polyester thread. The specified number of QC samples were taken and tested with each sample developing the required seam strengths. Once the high-strength geotextile was assembled, URS-ROS used two tracked hydraulic excavators and two high-strength cables to deploy the geotextile over the sludge pond area. URS-ROS then used a bulldozer and straps to set the geotextile into its final position over the sludge pond. The Type 1 geotextile was deployed to a distance of approximately 15 feet beyond the sludge pond limits. The approximate limits of the sludge pond are presented on the Ash Landfill Existing Conditions Drawing SU4A.

Once deployment was complete, URS-ROS used two lightweight dump trucks and a lightweight bulldozer to haul and place the stockpiled ash material on top of the high strength geotextile in a three to six foot thick lift. This ash layer is referred to as the Stage 1 Fill. Stage 1 Fill placement operations were initiated on October 21 and continued through November 5, 2003. Due to the continued instability of the high-strength (Type 1) geotextile on top of the sludge pond, additional ash was placed in order to stabilize all areas so construction equipment could traverse over the sludge pond. As a result, URSD adjusted the final grading plans so that additional ash could be removed from the southwest corner of the landfill and used in the Stage 1 Fill. This area was chosen based on a lack of buried ACM in the area.

Once placement of the Stage 1 Fill was complete, URS-ROS employed subcontractor DGI, Inc. to install the prefabricated vertical drains (PVDs) through the sludge in the sludge pond. DGI mobilized to the site on November 18, 2003 and initiated equipment assembly. PVD installation began on November 20 and was completed on December 16, 2003. DGI installed a total of 5,955 PVDs with a combined length of over 105,000 lineal feet. Each PVD was spaced on 4-foot centers in a triangular pattern, and anchored at least 1-foot beneath the sludge material, and had between 6 and 12 inches of stickup above the Stage 1 Fill. As the installation of the PVDs was completed in a portion of the

sludge pond, settlement platforms were installed according to the drawings and surveyed for location and elevation.

After the Stage 1 demobilization, and prior to Stage 2 Fill placement, a field load test was performed in the sludge pond area of the Ash Landfill. During this load test, a soft mound or "pop-up" area was discovered in the northeast section of the sludge pond. The surface was raised in this area and was unstable. URSD recommended the installation of a second geotextile layer over the effected area. The geotextile was specified as Amoco Propex 2044 woven polypropylene geotextile. An area was surveyed for the limits of the second geotextile and the material was installed. The final cover was then installed over the geotextile and seeded.

The settlement platforms were surveyed on a regular basis to document settlement in different areas of the sludge pond. After a reasonable monitoring period, the sludge pond was considered to be stable enough to bear the weight of the construction equipment and remaining cover material. The settlement platform locations are presented on Drawing SU4B.

### **Leachate Collection and Conveyance System Installation**

The leachate collection and conveyance system installation was initiated on October 20 and completed on November 12, 2003. The system was constructed in accordance with the specifications and the contract drawings. The leachate collection and conveyance system collects leachate from the Ash Landfill and transports it by gravity flow to the on site wastewater treatment plant. The leachate collection trench was comprised of slotted and corrugated 4-inch diameter HDPE pipe embedded in AASHTO #57 crushed stone and surrounded by a geotextile to prevent sediment from clogging the pipe. The leachate conveyance pipe was constructed of 4-inch diameter PVC SDR-35 pipe and embedded in crushed stone to assure pipe stability. The conveyance pipe was pressure tested to verify that the conveyance system would not leak under the anticipated operating conditions. The conveyance system met the requirements of the pressure test, and the conveyance system alignment is presented on Drawing SU4B.

### **Final Site Restoration and Final Seeding**

A portion of the Ash Landfill Cap Construction Project scope of work included restoration of specific areas that were outside the limits of the landfill or "off-cap". These requirements included installing off-cap geotextile to the lines and limits of the drawings. Once the geotextile was installed, a 6-inch thick layer of topsoil (amended cover soil) was constructed to establish a permanent growth of grass.

Access roads were constructed of geotextile and crushed stone in accordance with the specifications. Permanent drainage features (ditches, outlet structures, and culverts) were also required and constructed to the lines and limits of the drawings. In accordance with the specifications, erosion control blanket (ECB) was installed on all slopes within the disturbance area with slopes of 4H:1V or steeper.

Site restoration concluded with final seeding across the entire site to establish a permanent growth of grass. The areas included were the final landfill cap, the off-cap areas, both borrow areas, and any other area disturbed by construction activity. Seeding operations were performed from September 13, 2004 to September 25, 2004 and March 7, 2005.

Post-closure condition surveys of the West Borrow Area, East Borrow Area, and Ash Landfill are presented on Drawings SU2B, SU3B, and SU4B respectively.

### **Contract Closeout**

On October 12, 2004, the Final Inspection of the Kinston Ash Landfill Cap Construction Project was conducted by John Crowder and Ray Williams of NCDENR, James Proctor from the Kinston Facility, and Jim Whitty of URSD. A list of incomplete and remaining work items was developed and submitted to following the inspection. Work items that needed to be addressed included potential for erosion at the southern end of the Ash Landfill between the western portion that was completed early in 2004 and the eastern portion that was completed in September 2004. Also, minimal grass growth on the off-pile area northwest of and adjacent to the Ash Landfill was observed. No immediate action was necessary for these items.

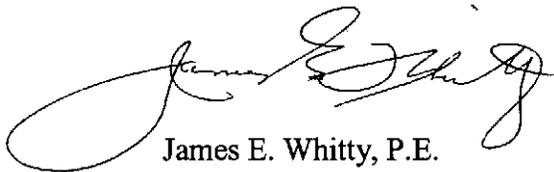
Since the vegetation was not established at the time of the Final Inspection, temporary E&S controls remained in place. In March 2005, temporary E&S controls (silt fence, closure of Sediment Traps 1 and 2) were removed, and erosional features that developed during the winter months were repaired. Work was completed on March 7, 2005.

### **Summary**

URSD, as the DSR, provided full-time construction oversight services during construction of the Kinston Ash Landfill Cap Construction Project. These services were provided from September 2003 through March 2005.

The observations made by URSD during closure of the Kinston Ash Landfill indicate that the work was performed in general conformance with the above referenced construction documents.

Sincerely,



James E. Whitty, P.E.  
Principal Engineer

North Carolina Professional Engineer License No. 28977





**THE EAST GROUP, P.A.**

DUPONT  
ASH LANDFILL  
KINSTON PLANT, LENOIR CO., N.C.

**SITE LOCATION PLAN**

SCALE: 1" = 100'

DATE: MAY 2003

SHEET 1 OF 7

PROJECT NO. 20030187

**SU1**

LEGEND:  
 MW = MONITORING WELL  
 CP = CONCRETE PAD  
 RCP = REINFORCED CONCRETE PIPE  
 CO = CLEAN OUT  
 PP = POWER POLE  
 SP = SETBACK SPOT  
 OE = OVERHEAD ELECTRIC LINE  
 SE = SETTLEMENT PLATE

GRAPHIC SCALE: 1" = 100'

NO.	DATE	DESCRIPTION	BY
1	05/19/03	DUPONT COMMENTS	MBH
2	05/19/03	DUPONT COMMENTS	MBH
3	05/19/03	DUPONT COMMENTS	MBH

PROJECT TITLE: DUPONT ASH LANDFILL KINSTON PLANT, LENOIR CO., N.C.



6/27/05

LEGEND

- 12" = 1" PROPOSED WELL
- 12" = 1" BOLLARD
- 12" = 1" CONCRETE PAV/ASPH. PAV
- 12" = 1" REINFORCED CONCRETE PIPE
- 12" = 1" SANDFILL SLEWER MANHOLE
- 12" = 1" CONCRETE PIPE
- 12" = 1" BRICKS 24" DIA. PIPE
- 12" = 1" LEACHATE CONFINEMENT PIPE
- 12" = 1" SETTLEMENT PLATE



NO.	DATE	DESCRIPTION	BY
1	06/02/05	SURVEY EXAMINER	MB
2	06/17/05	DRAWING COMMENTS	MB
3	06/19/05	SURVEY COMMENTS	MB
4		REVISIONS	



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 PROJECT FILE: 0030187  
 PRODUCT FILE: 0030187

DUPONT  
 ASH LANDFILL  
 KINSTON PLANT, LENOIR CO., N.C.

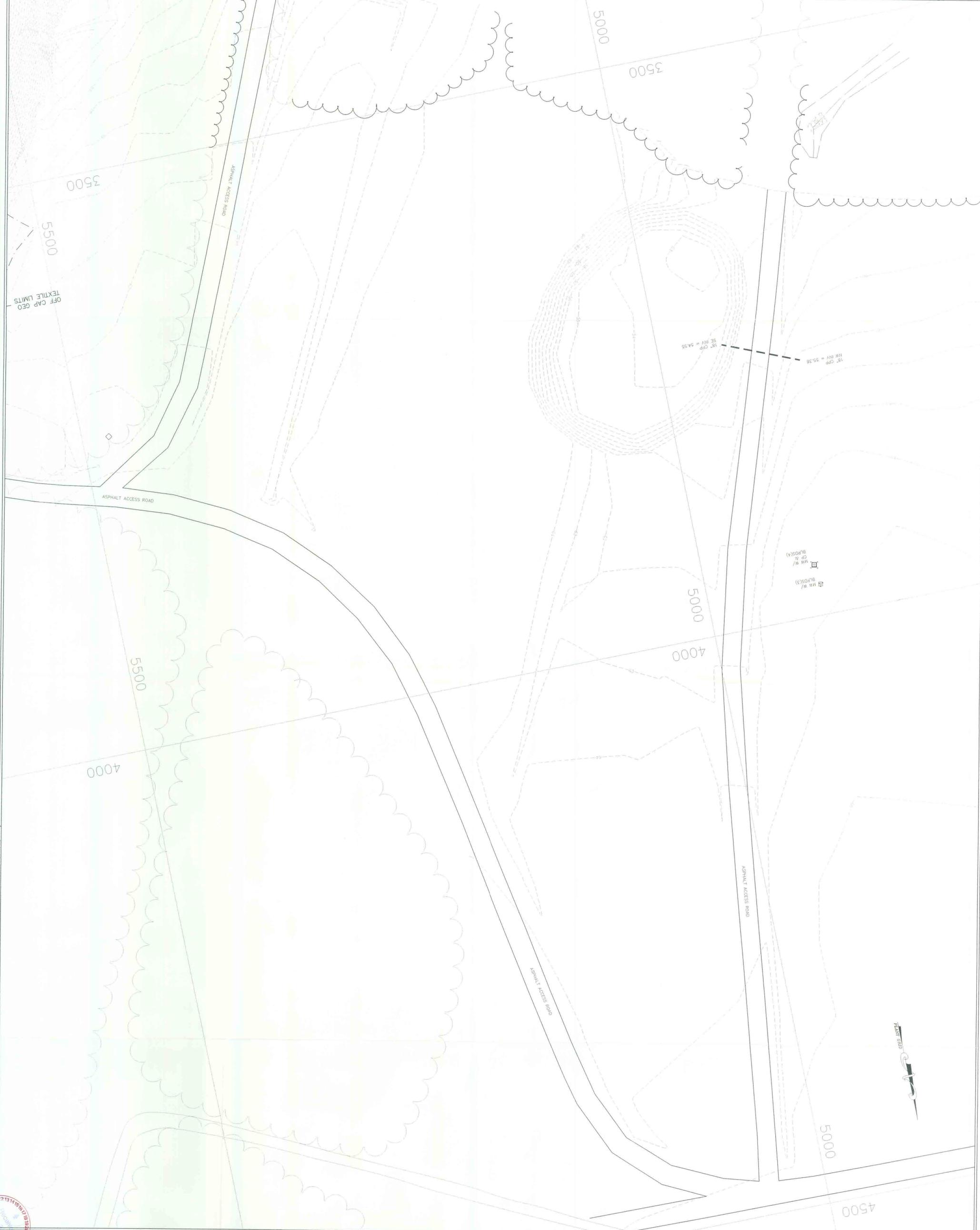
WEST BORROW AREA  
 EXISTING CONDITIONS

SCALE	DATE	BY
1" = 30'	06/17/05	MB
DATE	BY	
06/17/05	MB	
PROJECT FILE	0030187	
PROJECT DATE	AUGUST 2003 - MAY 2005	
DATE		
06/17/05		
DATE		
06/17/05		
DATE		
06/17/05		

SU2A







6/07/05



- LEGEND**
- MW = MONITORING WELL
  - GPB = GRANULAR BED
  - GP = CORRUGATED PLASTIC PIPE
  - CCP = CORRUGATED CONCRETE PIPE
  - CO = CLEAN OUT
  - SPM = SAND/SILT SCREEN MANHOLE
  - GW = DRY WIRE
  - CP = CONCRETE PIPE
  - CP = OPENENDED FLECTIC LINE
  - CP = LEACHATE CONVEYANCE PIPE
  - SE = SETTLEMENT PLATE

REV.	DATE	REVISIONS	BY
1	06/02/05	DRAWING COMMENTS	WH
2	06/19/05	DRAWING COMMENTS	WH
3	06/19/05	DRAWING COMMENTS	WH



**DUPONT  
ASH LANDFILL**  
KINSTON PLANT, LENOIR CO., N.C.

**EAST BORROW AREA  
EXISTING CONDITIONS**

SCALE	1" = 30'
DATE	AUGUST 2003 - MAY 2005
PROJECT NO.	00030187
PROJECT NAME	SU3A





NOTES:  
 1) THE LOCATION OF THE ASH LANDFILL CONVERSION COVERWALL AS DETERMINED BY SOIL BORINGS PERFORMED BY URS CORP AND OAKER INC.

- LEGEND
- MW = MONITORING WELL
  - CP = CONCRETE PAD
  - CLP = CONCRETE LAYER PIPE
  - CCP = REINFORCED CONCRETE PIPE
  - CO = CLEAN OUTF
  - CP = POWER POLE SEWER MANHOLE
  - SP = SPILLING SPOT
  - EL = OVERHEAD ELECTRIC LINE
  - SE = SETTLEMENT PLATE



NO.	DATE	DESCRIPTION	BY
0019130	04/19/03	ISSUED CONDITIONS	MM
0020105	04/20/03	ASPHALT ROAD AND PIPE 1 & 2 LINES TO SHEET 704	MM
0030005	05/02/03	REVISIONS	MM



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PROJECT TITLE  
 DUPONT  
 ASH LANDFILL  
 KINSTON PLANT, LENOIR CO., N.C.

ASH LANDFILL AREA  
 EXISTING CONDITIONS

SCALE 1" = 30'	DATE PLOTTED AUGUST 2003	DEPARTMENT SURVEY
DRAWN BY MMH	SHEET NO. 6 OF 7	DRAWING NO. SU4A
DATE AUGUST 2003	DATE MAY 2005	
PROJECT NO. 0030187		





NOTES:  
 1) THE LOCATION OF THE ASH LANDFILL CONCRETE IS LOCATED 0.5' BELOW THE LAMBERED ASH LANDFILL PERFORMED BY URS CORP AND OLIVER INC.

LEGEND

---	MW = MONITORING WELL
---	REFO = REINFORCED
---	PEP = OPENENDED PLASTIC PIPE
---	CO = CLEAN OUT CONCRETE PIPE
---	SSM = SAND PARY SENSER WASHWALE
---	GW = GWT WIRE POINT
---	--- = OVERHEAD ELECTRIC LINE
---	--- = LEAKAGE CONFORMANCE PIPE
---	--- = SETBACK 1' SIDE



NO.	DATE	REVISIONS
1	06/22/05	ISSUE FOR PERMITS
2	05/19/05	ISSUE FOR COMMENTS
3	05/01/05	ISSUE FOR COMMENTS
4	04/22/05	ISSUE FOR COMMENTS AND 1' X 1.5' LIMITS TO SHEET 544
5		REVISIONS
6		REV

**THE EAST GROUP, P.A.**  
 4301 Rte 108, Suite 200, Greensboro, NC 27409  
 PROJECT TITLE  
 DUPONT  
 ASH LANDFILL  
 LANDFILL AREA  
 POST ASH LANDFILL  
 CLOSURE CONDITIONS

DATE: 1" = 30'  
 DRAWN BY: DVE THAYER  
 SHEET: SHEET 7 OF 7  
 PROJECT TITLE: DUPONT ASH LANDFILL CLOSURE CONDITIONS  
 APPROVED: AUGUST 2003 - MAY 2005  
 DRAWING NO: 20030187  
**SU4B**

