


RICHARDSON SMITH GARDNER
& ASSOCIATES
ENGINEERING & GEOLOGICAL
SERVICES

January 24, 2011

Permit No.	Date	Document ID No.
32-01	January 25, 2011	12783

Mr. Joel Idol
Environmental Specialist
Division of Land Resources
Raleigh Regional Office
1628 Mail Service Center
Raleigh, NC 27699-1628

RECEIVED
January 24, 2011 via an e-mail
Solid Waste Section
Raleigh Central Office

RE: Erosion and Sedimentation Control Plan Submittal
Gas Collection and Control System Expansion
Durham Municipal Solid Waste Landfill Facility

Dear Mr. Idol:

On behalf of MP Durham, LLC, Richardson Smith Gardner & Associates (RSG) is submitting the enclosed erosion and sedimentation control plan for the referenced project. As stated in the narrative on the enclosed drawings, the proposed construction consists primarily of installing landfill gas conveyance pipes in shallow trenches and backfilling to original grades. Disturbed areas are limited to a 25-foot width along trench alignments. All work will occur within the landfill's existing perimeter drainage channels, which convey runoff to one of three existing sedimentation ponds. The project will not affect runoff rates and drainage patterns. Therefore, no stormwater calculations are included with this submittal.

The following items are enclosed: Erosion and Sedimentation Control Plan Preliminary Review Checklist, Financial Responsibility/Ownership Form, deed, and drawings. A soil survey map is also included per the checklist; however, it is not accurate since it does not reflect that the area is a landfill covered by a clay cap.

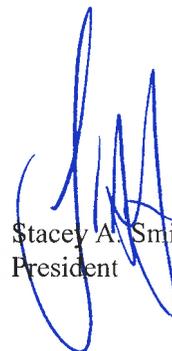
The proposed area of disturbance is 6.4 acres. The application fee of \$455 is enclosed.

If you require additional information or clarification, please contact us at (919) 828-0577.

Sincerely,
Richardson Smith Gardner & Associates, Inc.



Thomas B. Maier, P.E. (ext. 128)
Senior Project Engineer



Stacey A. Smith, P.E. (ext. 127)
President

Copy to: Amy Ratliff, P.E., Methane Power
Simon Lobdell, City of Durham
Ming Chao, P.E., NCDENR
File

H:\Projects\Methane Power\MP Durham County, LLC\E&S\letter.Idol.E&S submittal.doc

**NORTH CAROLINA DEPARTMENT OF ENVIRONMENT & NATURAL RESOURCES
LAND QUALITY SECTION
EROSION and SEDIMENTATION CONTROL PLAN PRELIMINARY REVIEW CHECKLIST**

The following items shall be incorporated with respect to specific site conditions, in an erosion & sedimentation control plan:

LOCATION INFORMATION

- Project location & labeled vicinity map (roads, streets, landmarks)
 - North arrow and scale
- Identify River Basin.
- Provide a copy of site located on applicable USGS quadrangle and NRCS Soils maps if it is in a River Basin with Riparian Buffer requirements.

GENERAL SITE FEATURES (Plan elements)

- Property lines & ownership ID for adjoining properties
- Existing contours (topographic lines)
- Proposed contours
- Limits of disturbed area (provide acreage total, delineate limits, and label). Be sure to include all access to measures, lots that will be disturbed, and utilities that may extend offsite.
- Planned and existing building locations and elevations
- Planned & existing road locations & elevations, including temporary access roads
- Lot and/or building numbers
- Hydrogeologic features: rock outcrops, seeps, springs, wetland and their limits, streams, lakes, ponds, dams, etc. (include all required local or state buffer zones and any DWQ Riparian Buffer determinations)
- Easements and drainageways, particularly required for offsite affected areas. Include copies of any recorded easements and/or agreements with adjoining property owners.
- Profiles of streets, utilities, ditch lines, etc.
- Stockpiled topsoil or subsoil locations
- If the same person conducts the land-disturbing activity & any related borrow or waste activity, the related borrow or waste activity shall constitute part of the land-disturbing activity unless the borrow or waste activity is regulated under the Mining Act of 1971, or is a landfill regulated by the Division of Waste Management. If the land-disturbing activity and any related borrow or waste activity are not conducted by the same person, they shall be considered separate land-disturbing activities and must be permitted either through the Sedimentation Pollution Control Act as a one-use borrow site or through the Mining Act.
- Location and details associated with any onsite stone crushing or other processing of material excavated. If the affected area associated with excavation, processing, stockpiles and transport of such materials will comprise 1 or more acres, and materials will be leaving the development tract, a mining permit will be required.
- Required Army Corps 404 permit and Water Quality 401 certification (e.g. stream disturbances over 150 linear feet)

EROSION & SEDIMENT CONTROL MEASURES (on plan)

- Legend (provide appropriate symbols for all measures and reference them to the construction details)
- Location of temporary measures
- Location of permanent measures
- Construction drawings and details for temporary and permanent measures. Show measures to scale on plan and include proposed contours where necessary. Ensure design storage requirements are maintained through all phases of construction.
- Maintenance requirements for measures
- Contact person responsible for maintenance

SITE DRAINAGE FEATURES

- Existing and planned drainage patterns (include off-site areas that drain through project and address temporary and permanent conveyance of stormwater over graded slopes)
- Method used to determine acreage of land being disturbed and drainage areas to all proposed measures (e.g. delineation map)
- Size, pipe material and location of culverts and sewers
- Soil information: type, special characteristics
- Soil information below culvert storm outlets

- Name and classification of receiving water course or name of municipal operator (only where stormwater discharges are to occur)

STORMWATER CALCULATIONS

- Pre-construction runoff calculations for each outlet from the site (at peak discharge points). Be sure to provide all supporting data for the computation methods used (rainfall data for required storm events, time of concentration/storm duration, and runoff coefficients).
- Design calculations for peak discharges of runoff (including the construction phase & the final runoff coefficients for the site)
- Design calcs for culverts and storm sewers (include HW, TW and outlet velocities)
- Discharge and velocity calculations for open channel and ditch flows (easement & rights-of-way)
- Design calcs for cross sections and method of stabilization for existing and planned channels (include temporary linings). Include appropriate permissible velocity and/or shear stress data.
- Design calcs and construction details for energy dissipaters below culvert and storm sewer outlets (include stone/material specs & apron dimensions). Avoid discharges on fill slopes.
- Design calcs and dimension of sediment basins (note current surface area and dewatering standards as well as diversion of runoff to the basins). Be sure that all surface drains, including ditches and berms, will have positive drainage to the basins.

VEGETATIVE STABILIZATION

- Area & acreage to be stabilized with vegetation
- Method of soil preparation
- Seed type & rates (temporary & permanent)
- Fertilizer type and rates
- Mulch type and rates (include mulch anchoring methods to be used)

NOTE: Plan should include provisions for groundcover on exposed slopes within 21 calendar days following completion of any phase of grading; permanent groundcover for all disturbed areas within 15 working days or 90 calendar days (whichever is shorter) following completion of construction or development.

FINANCIAL RESPONSIBILITY/OWNERSHIP FORM

- Completed, signed & notarized FR/O Form
- Accurate application fee payable to NCDENR (\$65.00 per acre rounded up the next acre with no ceiling amount)
- Certificate of assumed name, if the owner is a partnership
- Name of Registered Agent (if applicable)
- Copy of the most current Deed for the site. Please make sure the deed(s) and ownership information are consistent between the plan sheets, local records and this form.
- Provide latitude & longitude (in decimal degrees) at the project entrance.

NOTE: For the Express Permitting Option, inquire at the local Regional Office for availability.

NARRATIVE AND CONSTRUCTION SEQUENCE

- Narrative describing the nature & purpose of the construction activity
 - Construction sequence related to erosion and sediment control (including installation of critical measures prior to the initiation of the land-disturbing activity & removal of measures after areas they serve are permanently stabilized). Address all phases of construction and necessary practices associated with temporary stream bypasses and/or crossings.
- See Dwgs Bid specifications related only to erosion control

2. (a) If the Financially Responsible Party is not a resident of North Carolina, give name and street address of the designated North Carolina Agent:

_____			_____		
Name			E-mail Address		
_____			_____		
Current Mailing Address			Current Street Address		
_____	_____	_____	_____	_____	_____
City	State	Zip	City	State	Zip
Telephone _____			Fax Number _____		

(b) If the Financially Responsible Party is a Partnership or other person engaging in business under an assumed name, **attach a copy of the Certificate of Assumed Name**. If the Financially Responsible Party is a Corporation, give name and street address of the Registered Agent:

_____			_____		
Name of Registered Agent			E-mail Address		
_____			_____		
Current Mailing Address			Current Street Address		
_____	_____	_____	_____	_____	_____
City	State	Zip	City	State	Zip
Telephone _____			Fax Number _____		

The above information is true and correct to the best of my knowledge and belief and was provided by me under oath (This form must be signed by the Financially Responsible Person if an individual or his attorney-in-fact, or if not an individual, by an officer, director, partner, or registered agent with the authority to execute instruments for the Financially Responsible Person). I agree to provide corrected information should there be any change in the information provided herein.

James Voss
 Type or print name

[Signature]
 Signature

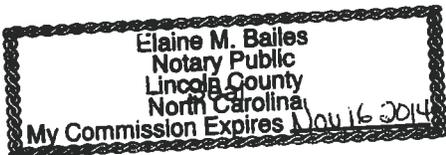
President
 Title or Authority

3 Jan 2011
 Date

I, Elaine M Bailes, a Notary Public of the County of Lincoln

State of North Carolina, hereby certify that James Voss appeared personally before me this day and being duly sworn acknowledged that the above form was executed by him.

Witness my hand and notarial seal, this 3rd day of January, 2011



Elaine M Bailes
 Notary

My commission expires Nov 16 2014

This deed prepared by Douglas A. Johnston, Attorney At Law.

NORTH CAROLINA DURHAM COUNTY

700 This Deed, made and entered into this, the 20th day of December, 1973, by and between JESSE B. VEASEY (SINGLE), SALLIE BELLE VEASEY (SINGLE), and SALLIE OTIE VEASEY (SINGLE).

part ies of the first part, and CITY OF DURHAM, a municipal corporation, party of the second part, WITNESSETH: That for and in consideration of the sum of Fifty Thousand and No/100 (\$50,000.00)

Dollars to them in hand paid, the receipt of which is hereby fully acknowledged, said part ies of the first part have given, granted, bargained and sold and do by these presents, give, grant, bargain, sell and convey unto it, said party of the second part, and its successors and assigns, the following lot or parcel of land, lying and being in Oak Grove Township, in said County and State bounded and described as follows, to-wit:

BEGINNING at an iron pin on the western property line of Jimmy Glenn Road and the northern property line of Mary J. Holloway Heirs and running N 86° 07' 19" W along said northern property line of Mary J. Holloway Heirs, a distance of 995.30 feet to a rock on the eastern property line of City Tract 562; thence N 3° 20' 00" E along said eastern property line of City Tract 562, a distance of 1099.75 feet to an iron pin on the northern property line of City Tract 562; thence N 86° 45' 51" W along said northern property line of City Tract 562, a distance of 1832.00 feet to an iron pin on the eastern property line of City Tract 525; thence N 34° 57' 40" E with said eastern property line of City Tract 525 along Old Run Ellerbee Creek, a distance of 1200.00 feet to a monument on the southern property line of Leon Weaver; thence S 86° 51' 41" E along said southern property line of Leon Weaver a distance of 2958.14 feet to an iron pin; thence S 12° 53' 53" W along the western property line of Leon Weaver, George C. Emory, and Wilton T. Hicks, a distance of 568.62 feet to a monument on the northern property of Jesse B. Veasey; thence N 89° 34' 26" W along said northern property line of Jesse B. Veasey, a distance of 677.05 feet to a monument on the western property line of Jesse B. Veasey; thence S 7° 39' 30" W along said western property line of Jesse B. Veasey, a distance of 820.69 feet to a monument on the southern property line of Jesse B. Veasey; thence S 90° 00' 00" E along the southern property line of Jesse B. Veasey, a distance of 448.37 feet to a monument on the western property line of Jimmy Glenn Road; thence S 29° 53' 37" W along said western property line of Jimmy Glenn Road, a distance of 839.14 feet to an iron pin, the place and point of beginning. For further description, see map showing City Tract 884, prepared by the Department of Transportation and Utilities, City of Durham, N.C., said map dated October 26, 1973, and recorded in the Office of the Register of Deeds of Durham County in Plat Book 79, Page 64.

To Have and To Hold said lot or parcel of land, together with all privileges and appurtenances thereon and thereto belonging unto it, said party of the second part, and its successors and assigns forever in fee simple.

And said parties of the first part for themselves and their heirs covenant to and with said party of the second part and its successors and assigns that they are seized of said premises in fee, and have VE good right to convey the same in fee simple; that the same are free and clear of all encumbrances, and that they will forever warrant and defend the said title to the same against the claims of all persons whomsoever.

In Testimony Whereof, The said part ies of the first part have set their hands and seal S, the day and year first above written.
Sallie Otie Veasey (SEAL)
Sallie Belle Veasey (SEAL)
Jesse B. Veasey (SEAL)

NORTH CAROLINA Durham County, Carly G. Hendon, a Notary Public of Durham

County, N. C., do hereby certify that Jesse B. Veasey (Single), Sallie Belle Veasey (Single), and Sallie Otie Veasey (Single) personally appeared before me this day and acknowledged the due execution of the foregoing deed.

Witness my hand and notarial seal this the 20 day of DECEMBER, 1973
My Commission Expires May 3, 1978
Carly G. Hendon Notary Public

Carly G. Hendon a Notary Public of Durham County, State of North Carolina do hereby certify that Jesse B. Veasey (Single), Sallie Belle Veasey (Single), and Sallie Otie Veasey (Single) appeared before me this day and acknowledged the due execution of the

NORTH CAROLINA — DURHAM COUNTY
The foregoing certificate of Carly G. Hendon Notary Public of Durham State of North Carolina is certified to be correct.
Let this instrument with all certificates be registered.
This 20 day of December, 1973

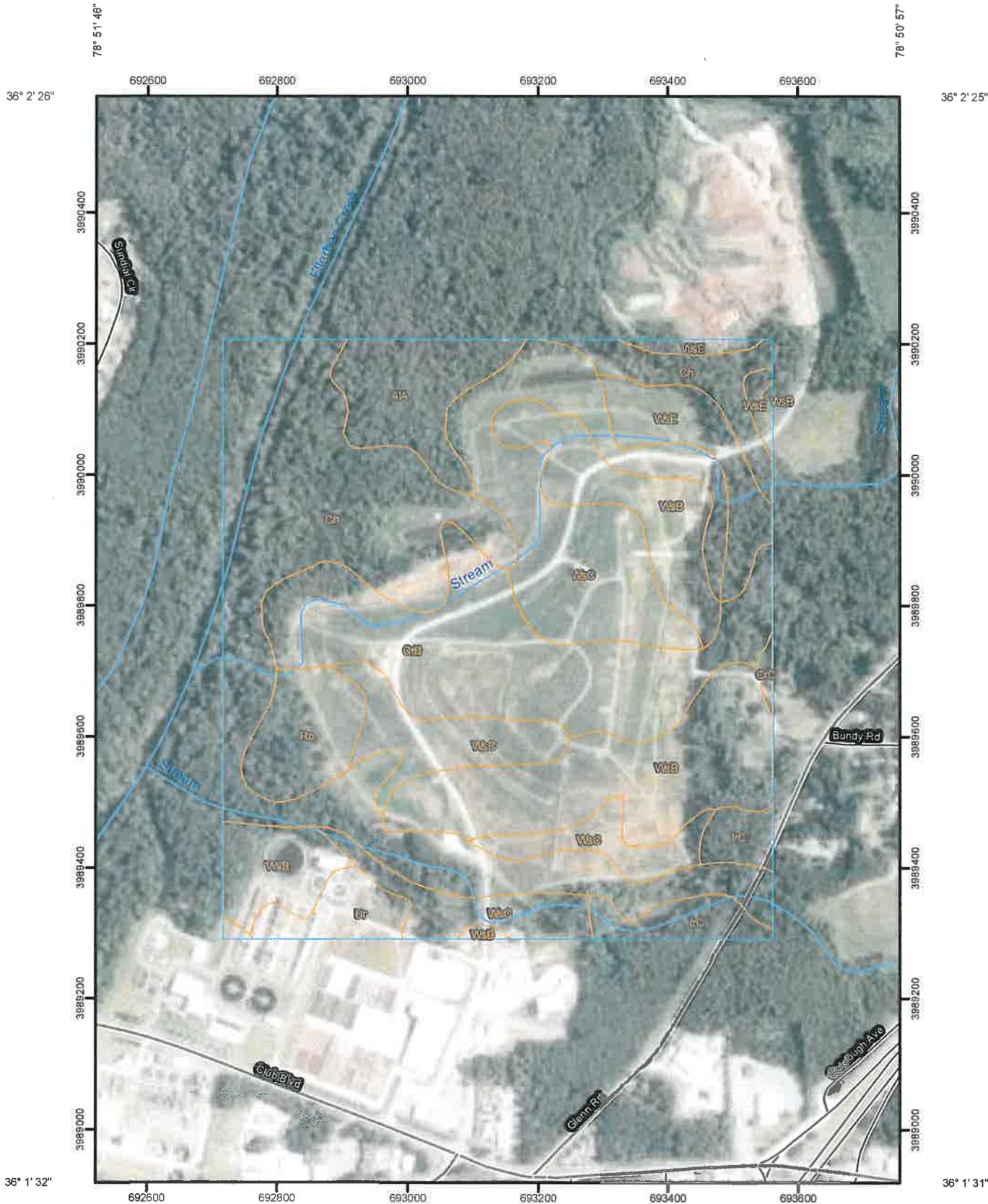
Mildred D. Bunt Register of Deeds
Deputy Register of Deeds

NORTH CAROLINA — DURHAM COUNTY
Filed for registration in my office on 20 day of Dec, 1973 at 3:45 o'clock P.M. and registered on the 20 day of Dec, 1973 in Book 409 of Deeds for said County on Page 211.

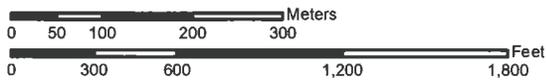
REGISTER OF DEEDS OF DURHAM COUNTY
BY Mildred D. Bunt
Deputy Register of Deeds

Handwritten notes: "The gift is to the City of Durham 1973" and "6-4-80"

Soil Map—Durham County, North Carolina
(Landfill Gas System Expansion)



Map Scale: 1:7,920 if printed on A size (8.5" x 11") sheet.



MAP LEGEND

 Area of Interest (AOI)	 Very Stony Spot
 Soils	 Wet Spot
 Soil Map Units	 Other
Special Point Features	Special Line Features
 Blowout	 Gully
 Borrow Pit	 Short Steep Slope
 Clay Spot	 Other
 Closed Depression	Political Features
 Gravel Pit	 Cities
 Gravelly Spot	Water Features
 Landfill	 Oceans
 Lava Flow	 Streams and Canals
 Marsh or swamp	Transportation
 Mine or Quarry	 Rails
 Miscellaneous Water	 Interstate Highways
 Perennial Water	 US Routes
 Rock Outcrop	 Major Roads
 Saline Spot	 Local Roads
 Sandy Spot	
 Severely Eroded Spot	
 Sinkhole	
 Slide or Slip	
 Sodic Spot	
 Spoil Area	
 Stony Spot	

MAP INFORMATION

Map Scale: 1:7,920 if printed on A size (8.5" x 11") sheet.
 The soil surveys that comprise your AOI were mapped at 1:15,840.
 Please rely on the bar scale on each map sheet for accurate map measurements.
 Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: UTM Zone 17N NAD83
 This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.
 Soil Survey Area: Durham County, North Carolina
 Survey Area Data: Version 14, Feb 19, 2010
 Date(s) aerial images were photographed: 6/19/2006
 The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

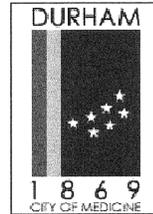
Durham County, North Carolina (NC063)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AIA	Altavista silt loam, 0 to 2 percent slopes, rarely flooded	9.3	4.8%
Ch	Chewacla and Wehadkee soils, 0 to 2 percent slopes, frequently flooded	51.0	26.6%
CrB	Creedmoor sandy loam, 2 to 6 percent slopes	29.1	15.2%
CrC	Creedmoor sandy loam, 6 to 10 percent slopes	0.4	0.2%
IrC	Iredell loam, 6 to 10 percent slopes	5.8	3.0%
Ro	Roanoke silt loam, 0 to 2 percent slopes, occasionally flooded	7.0	3.6%
Ur	Urban land	4.1	2.1%
WsB	White Store sandy loam, 2 to 6 percent slopes	35.7	18.7%
WsC	White Store sandy loam, 6 to 10 percent slopes	40.0	20.9%
WsE	White Store sandy loam, 10 to 25 percent slopes	9.0	4.7%
Totals for Area of Interest		191.4	100.0%

DURHAM MUNICIPAL SOLID WASTE LANDFILL FACILITY DURHAM COUNTY, NORTH CAROLINA

LANDFILL GAS COLLECTION AND CONTROL SYSTEM EXPANSION

DECEMBER 2010

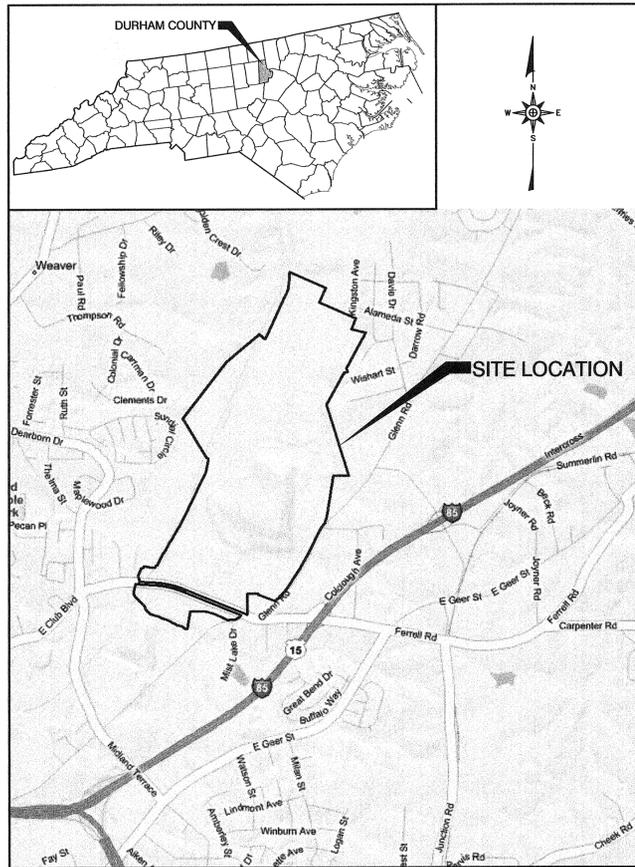
12/17/10	1	ADDED E&S MEASURES
DATE	NO.	REVISION



CH⁴POWER
smart energy
MP DEVELOPER, LLC

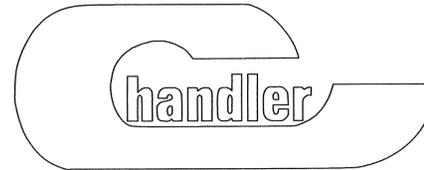
DISTURBED AREA: 6.41 AC.

E&S CONTACT PERSON:
AMY RATLIFF, P.E.
(919)-294-4770



SITE LOCATION MAP
NOT TO SCALE

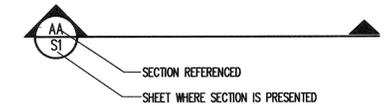
IN ASSOCIATION WITH:



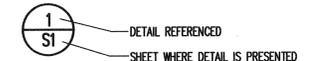
1511 NINETY SIX HIGHWAY
NINETY SIX, SOUTH CAROLINA
29666

SHEET NO.	DRAWING NO.	DRAWING TITLE	REVISION
1	-	TITLE - COVER SHEET	△
2	S1	EXISTING CONDITIONS	
3	S3	PROPOSED MODIFICATIONS TO EXISTING LANDFILL GAS COLLECTION SYSTEM	△
4	D1	EXISTING DETAILS (SHEET 1 OF 2)	
5	D2	EXISTING DETAILS (SHEET 2 OF 2)	
6	D3	LANDFILL GCGS DETAILS (SHEET 1 OF 3)	
7	D4	LANDFILL GCGS DETAILS (SHEET 2 OF 3)	
8	D5	LANDFILL GCGS DETAILS (SHEET 3 OF 3)	
9	EC1	EROSION AND SEDIMENTATION CONTROL DETAILS (SHEET 1 OF 2)	△
10	EC2	EROSION AND SEDIMENTATION CONTROL DETAILS (SHEET 2 OF 2)	△

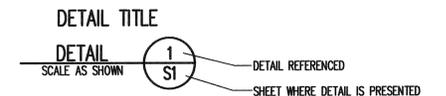
STANDARD SECTION LOCATION CALLOUT (SHEET AND DETAIL)



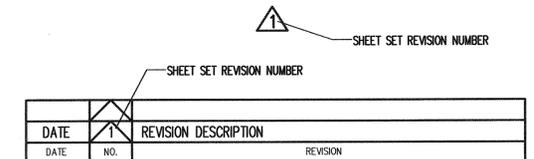
STANDARD DETAIL CALLOUT



STANDARD DETAIL LABEL AND CALLOUT



STANDARD REVISION CALLOUT (SHEET AND DETAIL)



PERMIT ISSUE
NOT FOR CONSTRUCTION

**RICHARDSON SMITH GARDNER
& ASSOCIATES**

14 N. Boylan Ave. Raleigh, N.C. 27603 ph: 919-828-0577 fax: 919-828-3899

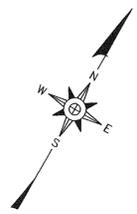
NC LIC. NO. C-0828 (Engineering) www.rsgengineers.com

SAFETY NOTE:
Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.

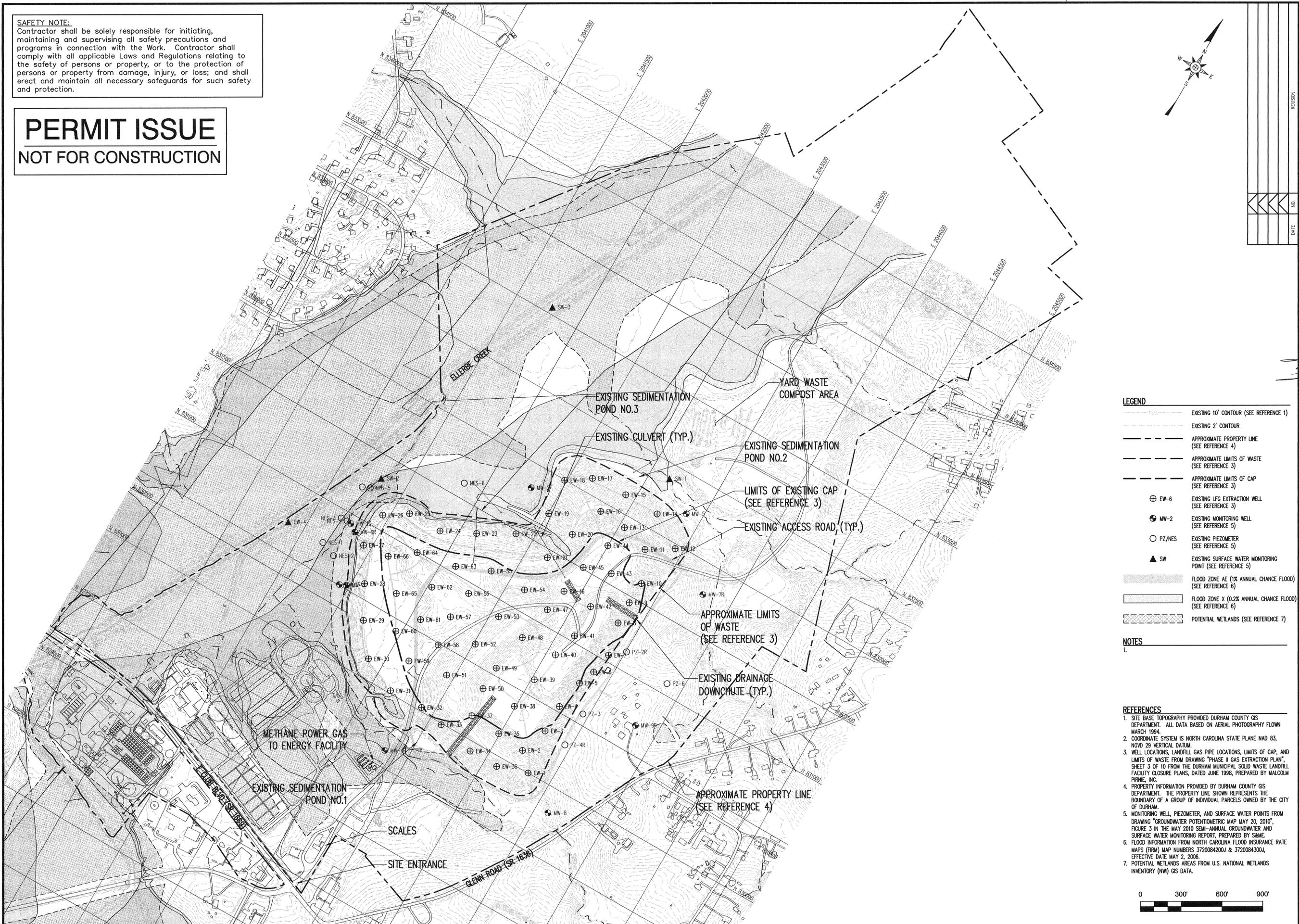
SAFETY NOTE:
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PERMIT ISSUE
NOT FOR CONSTRUCTION

RICHARDSON SMITH GARDNER & ASSOCIATES
www.rsgengineers.com
14 N. Boylan Ave. Raleigh, N.C. 27603
ph: 919-428-0577 fax: 919-428-3889



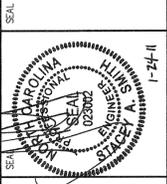
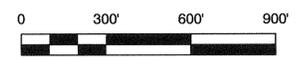
REVISION	NO.	DATE



- LEGEND**
- 150' --- EXISTING 10' CONTOUR (SEE REFERENCE 1)
 - EXISTING 2' CONTOUR
 - APPROXIMATE PROPERTY LINE (SEE REFERENCE 4)
 - APPROXIMATE LIMITS OF WASTE (SEE REFERENCE 3)
 - APPROXIMATE LIMITS OF CAP (SEE REFERENCE 3)
 - ⊕ EW-6 EXISTING LFG EXTRACTION WELL (SEE REFERENCE 3)
 - ⊕ MW-2 EXISTING MONITORING WELL (SEE REFERENCE 5)
 - PZ/NES EXISTING PIEZOMETER (SEE REFERENCE 5)
 - ▲ SW EXISTING SURFACE WATER MONITORING POINT (SEE REFERENCE 5)
 - ▨ FLOOD ZONE AE (1% ANNUAL CHANCE FLOOD) (SEE REFERENCE 6)
 - ▩ FLOOD ZONE X (0.2% ANNUAL CHANCE FLOOD) (SEE REFERENCE 6)
 - ▧ POTENTIAL WETLANDS (SEE REFERENCE 7)

NOTES
1.

- REFERENCES**
1. SITE BASE TOPOGRAPHY PROVIDED DURHAM COUNTY GIS DEPARTMENT. ALL DATA BASED ON AERIAL PHOTOGRAPHY FLOWN MARCH 1994.
 2. COORDINATE SYSTEM IS NORTH CAROLINA STATE PLANE NAD 83, NGVD 29 VERTICAL DATUM.
 3. WELL LOCATIONS, LANDFILL GAS PIPE LOCATIONS, LIMITS OF CAP, AND LIMITS OF WASTE FROM DRAWING "PHASE II GAS EXTRACTION PLAN", SHEET 3 OF 10 FROM THE DURHAM MUNICIPAL SOLID WASTE LANDFILL FACILITY CLOSURE PLANS, DATED JUNE 1998, PREPARED BY MALCOLM PIRNIE, INC.
 4. PROPERTY INFORMATION PROVIDED BY DURHAM COUNTY GIS DEPARTMENT. THE PROPERTY LINE SHOWN REPRESENTS THE BOUNDARY OF A GROUP OF INDIVIDUAL PARCELS OWNED BY THE CITY OF DURHAM.
 5. MONITORING WELL, PIEZOMETER, AND SURFACE WATER POINTS FROM DRAWING "GROUNDWATER POTENTIOMETRIC MAP MAY 20, 2010", FIGURE 3 IN THE MAY 2010 SEMI-ANNUAL GROUNDWATER AND SURFACE WATER MONITORING REPORT, PREPARED BY S&ME.
 6. FLOOD INFORMATION FROM NORTH CAROLINA FLOOD INSURANCE RATE MAPS (FIRM) MAP NUMBERS 3720084200J & 3720084300J, EFFECTIVE DATE MAY 2, 2006.
 7. POTENTIAL WETLANDS AREAS FROM U.S. NATIONAL WETLANDS INVENTORY (NW) GIS DATA.



DURHAM MUNICIPAL SOLID WASTE LANDFILL FACILITY GAS COLLECTION AND CONTROL SYSTEM EXPANSION

EXISTING CONDITIONS

DESIGNED BY:	DRAWN BY:
S.A.S.	C.T.J.
CHECKED BY:	PROJECT NO.:
TRM	MPD 10-1
SCALE:	DATE:
AS SHOWN	DEC. 2010
FILE NAME:	
MPD-00001	
SHEET NO.	DRAWING NO.
2	S1

G:\CAD\MP-Durham County\MPD 10-1\Inhouse\MPD-0001.dwg - 12/27/2010 11:04 AM

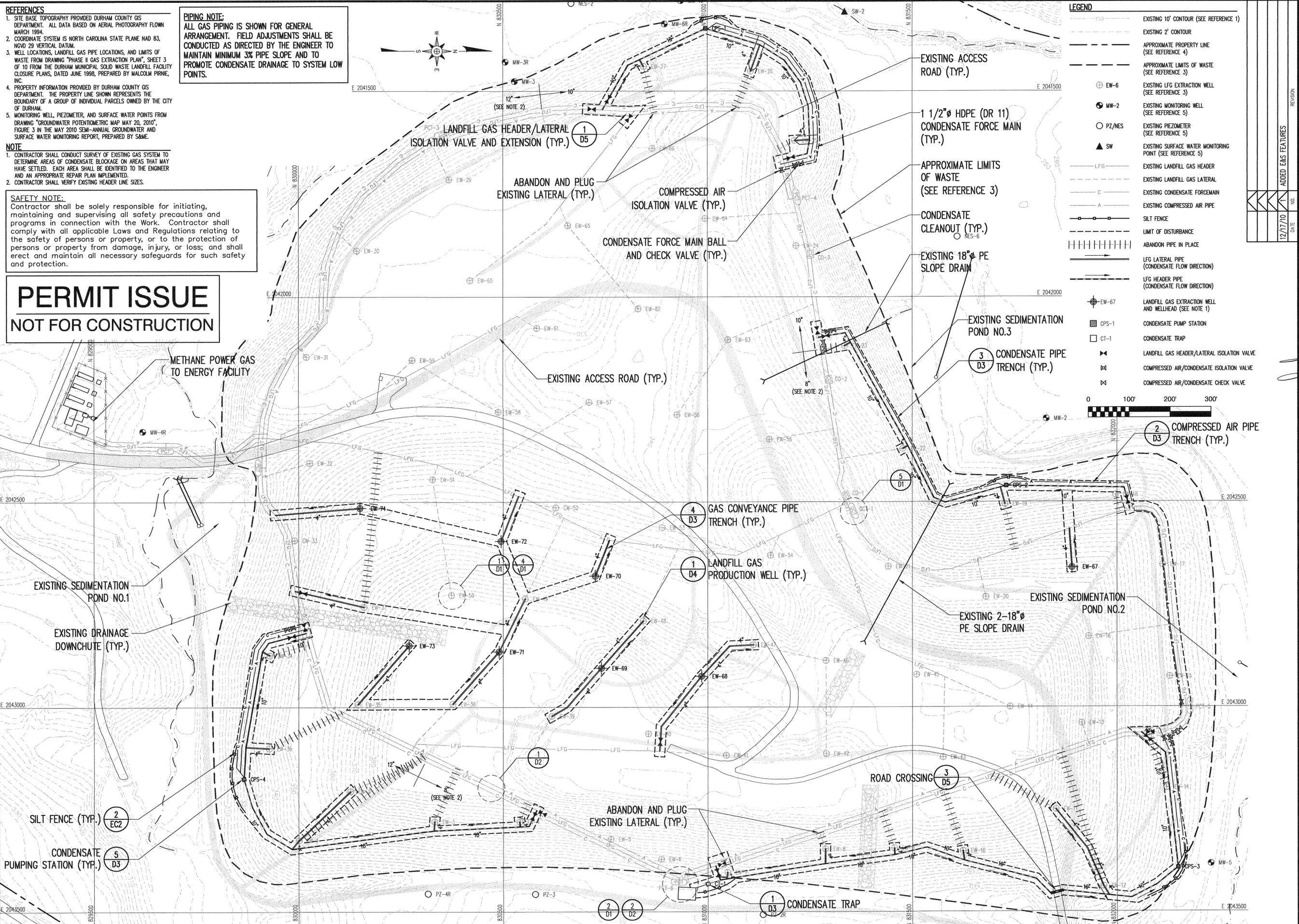
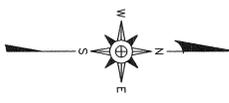
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 3. WELL LOCATIONS, LANDFILL GAS PIPE LOCATIONS, AND LIMITS OF WASTE FROM DRAWING "PHASE II GAS EXTRACTION PLAN", SHEET 3 OF 10 FROM THE DURHAM MUNICIPAL SOLID WASTE LANDFILL FACILITY CLOSURE PLANS, DATED JUNE 1998, PREPARED BY MALCOLM PIRNIE, INC.
 4. PROPERTY INFORMATION PROVIDED BY DURHAM COUNTY GIS DEPARTMENT. THE PROPERTY LINE SHOWN REPRESENTS THE BOUNDARY OF A GROUP OF INDIVIDUAL PARCELS OWNED BY THE CITY OF DURHAM.
 5. MONITORING WELL, PIEZOMETER, AND SURFACE WATER POINTS FROM DRAWING "GROUNDWATER POTENTIOMETRIC MAP MAY 20, 2010", FIGURE 3 IN THE MAY 2010 SEMI-ANNUAL GROUNDWATER AND SURFACE WATER MONITORING REPORT, PREPARED BY S&ME.

- NOTE**
1. CONTRACTOR SHALL CONDUCT SURVEY OF EXISTING GAS SYSTEM TO DETERMINE AREAS OF CONDENSATE BLOCKAGE ON AREAS THAT MAY HAVE SETTLED. EACH AREA SHALL BE IDENTIFIED TO THE ENGINEER AND AN APPROPRIATE REPAIR PLAN IMPLEMENTED.
 2. CONTRACTOR SHALL VERIFY EXISTING HEADER LINE SIZES.

SAFETY NOTE:
Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.

**PERMIT ISSUE
NOT FOR CONSTRUCTION**

PIPING NOTE:
ALL GAS PIPING IS SHOWN FOR GENERAL ARRANGEMENT. FIELD ADJUSTMENTS SHALL BE CONDUCTED AS DIRECTED BY THE ENGINEER TO MAINTAIN MINIMUM 3% PIPE SLOPE AND TO PROMOTE CONDENSATE DRAINAGE TO SYSTEM LOW POINTS.



LEGEND

- EXISTING 10' CONTOUR (SEE REFERENCE 1)
- EXISTING 2' CONTOUR
- - - - - APPROXIMATE PROPERTY LINE (SEE REFERENCE 4)
- - - - - APPROXIMATE LIMITS OF WASTE (SEE REFERENCE 3)
- ⊕ EW-6 EXISTING LFG EXTRACTION WELL (SEE REFERENCE 3)
- ⊕ MW-2 EXISTING MONITORING WELL (SEE REFERENCE 5)
- PZ/NES EXISTING PIEZOMETER (SEE REFERENCE 5)
- ▲ SW EXISTING SURFACE WATER MONITORING POINT (SEE REFERENCE 5)
- LFG EXISTING LANDFILL GAS HEADER
- C EXISTING LANDFILL GAS LATERAL
- A EXISTING CONDENSATE FORCE MAIN
- EXISTING COMPRESSED AIR PIPE
- SILT FENCE
- - - - - LIMIT OF DISTURBANCE
- ||||| ABANDON PIPE IN PLACE
- LFG LATERAL PIPE (CONDENSATE FLOW DIRECTION)
- LFG HEADER PIPE (CONDENSATE FLOW DIRECTION)
- ⊕ EW-67 LANDFILL GAS EXTRACTION WELL AND WELLHEAD (SEE NOTE 1)
- ⊕ CPS-1 CONDENSATE PUMP STATION
- CT-1 CONDENSATE TRAP
- ⊕ LANDFILL GAS HEADER/LATERAL ISOLATION VALVE
- ⊕ COMPRESSED AIR/CONDENSATE ISOLATION VALVE
- ⊕ COMPRESSED AIR/CONDENSATE CHECK VALVE

0 100' 200' 300'

RICHARDSON SMITH GARDNER & ASSOCIATES
14 N. Boylan Ave., Raleigh, N.C. 27603
ph: 919-428-0577
fax: 919-428-3889
www.regengineers.com

PROJECT TITLE: DURHAM MUNICIPAL SOLID WASTE LANDFILL FACILITY GAS COLLECTION AND CONTROL SYSTEM EXPANSION

SCALE: 1"=24'-11"

DATE: 12/17/10

PROPOSED MODIFICATIONS TO EXISTING LANDFILL GAS COLLECTION SYSTEM

DESIGNED BY: S.A.S. DRAWN BY: C.T.J.

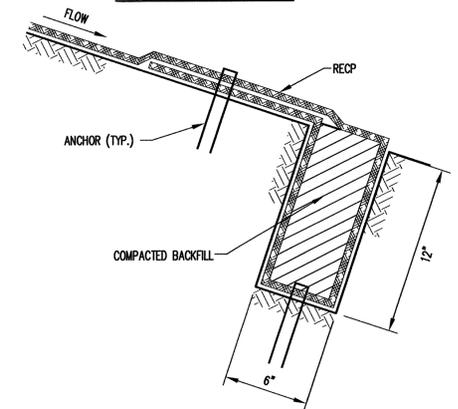
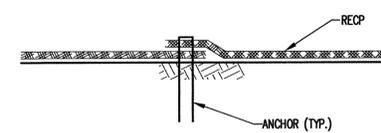
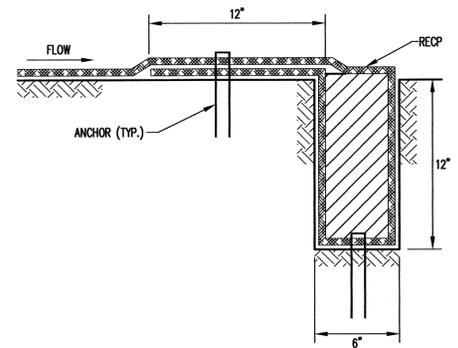
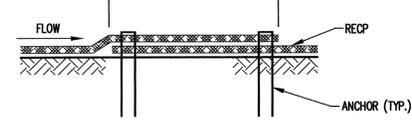
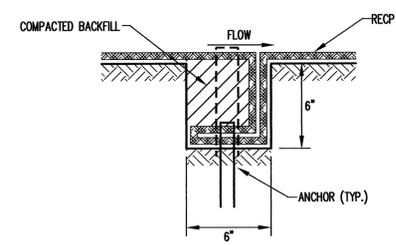
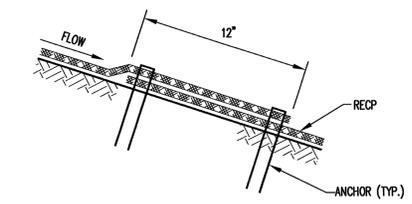
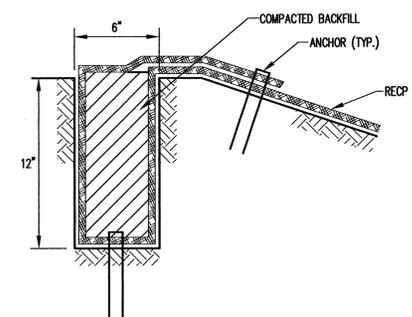
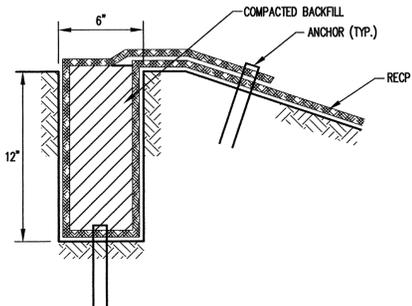
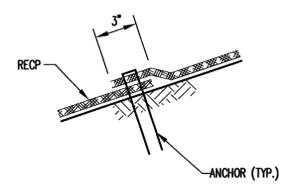
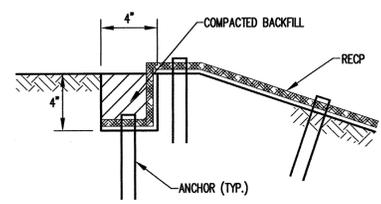
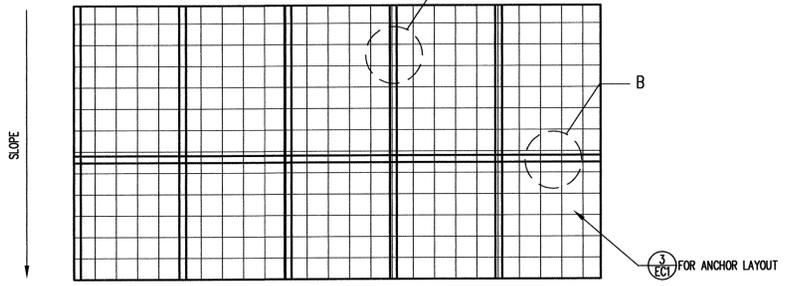
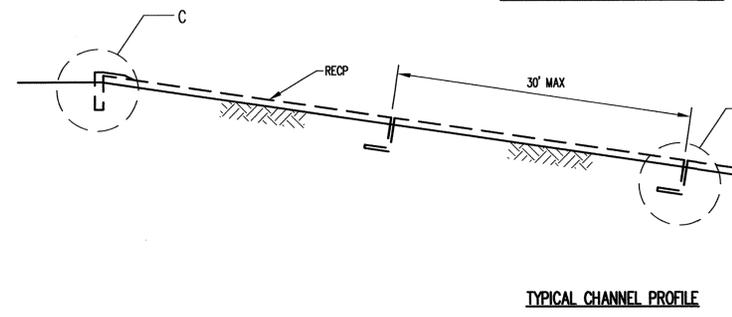
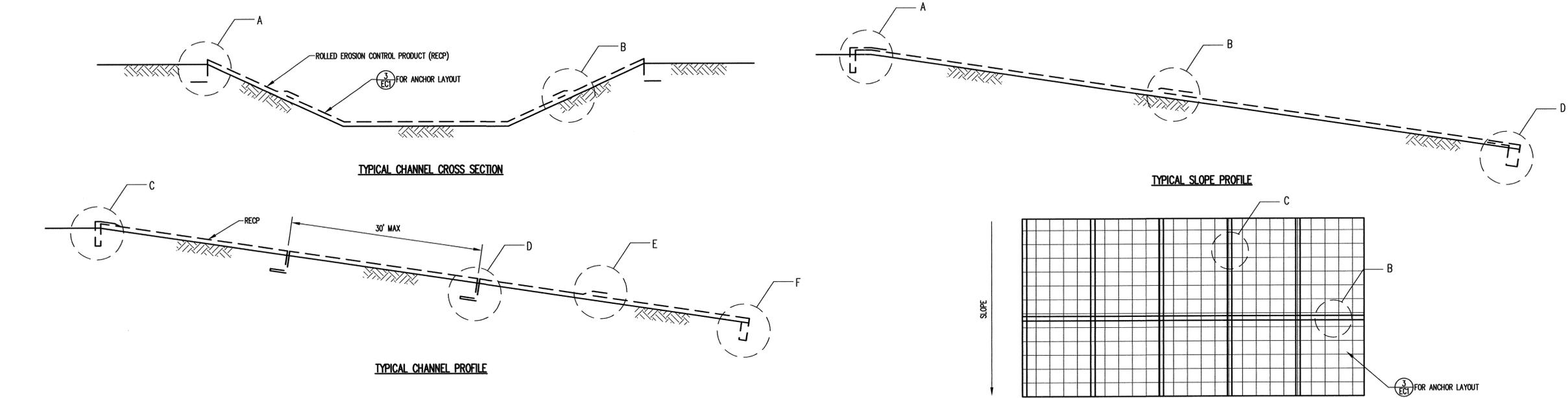
CHECKED BY: TBA PROJECT NO.: MPD 10-1

SCALE: AS SHOWN DATE: DEC. 2010

FILE NAME: MPD-00007A

SHEET NO. 3 DRAWING NO. S3

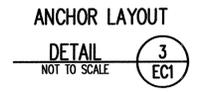
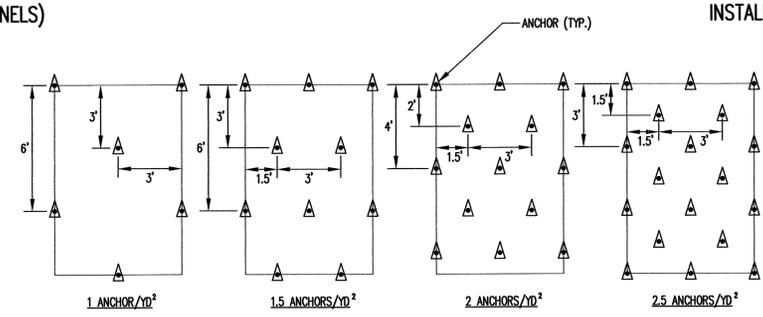
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NOTES:
 1. PLACE ANCHORS AT ANCHOR TRENCHES, OVERLAPS, AND CHECK SLOTS ON 1 FOOT CENTERS. IF APPLICABLE, STAGGER ANCHOR SPACING BETWEEN MULTIPLE ROWS OF ANCHORS.

NOTE:
 1. PLACE ANCHORS AT ANCHOR TRENCHES, OVERLAPS, AND CHECK SLOTS ON 1 FOOT CENTERS. IF APPLICABLE, STAGGER ANCHOR SPACING BETWEEN MULTIPLE ROWS OF ANCHORS.

INSTALLATION OF ROLLED EROSION CONTROL PRODUCTS (CHANNELS)



INSTALLATION OF ROLLED EROSION CONTROL PRODUCTS (SLOPES)



PERMIT ISSUE
 NOT FOR CONSTRUCTION

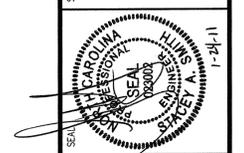
SAFETY NOTE:
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REVISION

NO.	DATE	ADDED E&S MEASURES
1	12/17/10	

12/17/10

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 fax: 919-228-3899
 www.regenengineers.com



DURHAM MUNICIPAL SOLID WASTE LANDFILL FACILITY GAS COLLECTION AND CONTROL SYSTEM EXPANSION

EROSION AND SEDIMENTATION CONTROL DETAILS (SHEET 1 OF 2)

DESIGNED BY: T.B.M.	DRAWN BY: W.R.B.
CHECKED BY: TBM	PROJECT NO.: MPD 10-1
SCALE: AS SHOWN	DATE: DEC. 2010
FILE NAME: MPD-D0010	DRAWING NO.:
SHEET NO. 9	EC1

DATA REQUIRED BY EAS CHECKLIST:

RIVER BASIN: NEUSE

NAME AND CLASSIFICATION OF RECEIVING WATER COURSE:
ELERBE CREEK, WS-IV, NSW

NATURE AND PURPOSE OF THE CONSTRUCTION ACTIVITY:
A RENEWABLE ENERGY PRODUCTION SYSTEM CURRENTLY OPERATES AT THE LANDFILL, WHICH INCLUDES LANDFILL GAS EXTRACTION WELLS, LANDFILL GAS CONVEYANCE PIPES, AND LANDFILL-GAS-POWERED GENERATORS. THE CONSTRUCTION ACTIVITY CONSISTS PRIMARILY OF INSTALLING NEW LANDFILL GAS CONVEYANCE PIPES IN SHALLOW TRENCHES AND BACKFILLING TO ORIGINAL GRADES. DISTURBED AREAS ARE GENERALLY LIMITED TO A 25-FOOT WIDTH ALONG TRENCH ALIGNMENTS. ALL WORK WILL OCCUR WITHIN THE LANDFILL'S EXISTING PERIMETER DRAINAGE CHANNELS, WHICH CONVEY RUNOFF TO ONE OF THREE EXISTING SEDIMENTATION PONDS. THE PROJECT WILL NOT AFFECT RUNOFF RATES AND DRAINAGE PATTERNS.

GENERAL EROSION AND SEDIMENTATION CONTROL NOTES

- ALL EROSION AND SEDIMENTATION CONTROL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL AS WELL AS APPLICABLE REGULATIONS.
- EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE ESTABLISHED PRIOR TO, OR AS SOON AS PRACTICAL THEREAFTER, ANY LAND CLEARING OR CONSTRUCTION ACTIVITIES MAY BEGIN.
- ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE CONSTRUCTED ACCORDING TO THE CONTRACT DRAWINGS AND SPECIFICATIONS.
- ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS AFTER ANY STORM EVENT OF GREATER THAN 0.5 INCHES OF RAIN PER 24 HOUR PERIOD AND APPROPRIATE MAINTENANCE CONDUCTED. MAINTENANCE SHALL INCLUDE, BUT NOT BE LIMITED TO:
 - THE REMOVAL AND SATISFACTORY DISPOSAL OF TRAPPED OR DEPOSITED SEDIMENTS FROM BASINS, TRAPS, BARRIERS, FILTERS, AND/OR DRAINAGE FEATURES/DEVICES;
 - REPLACEMENT OF FILTER FABRICS USED FOR SILT FENCES UPON LOSS OF EFFICIENCY; AND
 - REPLACEMENT OF ANY OTHER COMPONENTS WHICH ARE DAMAGED OR CANNOT SERVE THE INTENDED USE.
- THE CONTRACTOR SHALL PROVIDE TEMPORARY OR PERMANENT GROUND COVER (OR OTHER ACCEPTABLE MEASURES) IN ACCORDANCE WITH THE NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL ADEQUATE TO RESTRAIN EROSION ON ERODIBLE SLOPES OR OTHER AREAS WITHIN 21 CALENDAR DAYS FOLLOWING COMPLETION OF ANY PHASE OF DISTURBANCE. THE CONTRACTOR SHALL PROVIDE PERMANENT GROUND COVER FOR ALL DISTURBED AREAS WITHIN 15 WORKING DAYS OR 21 CALENDAR DAYS (WHICHEVER IS SHORTER) FOLLOWING THE COMPLETION OF CONSTRUCTION.
- CONTROL SEDIMENT TRACKING ON ROADS AND STREETS BY USE OF CONSTRUCTION ENTRANCES, SWEEPING AND/OR TRUCK WASHES.
- REMOVE ANY SEDIMENT THAT IS TRANSPORTED FROM DISTURBED AREAS TO EXISTING CHANNELS AND SEDIMENTATION PONDS.
- INSTALL EROSION CONTROL BLANKET AND ESTABLISH PERMANENT VEGETATIVE STABILIZATION ON ALL DISTURBED SURFACES.
- INSTALL STRAW WATTLES WHEREVER SEDIMENT TRANSPORT BEYOND LIMITS OF DISTURBANCE IS OBSERVED.
- AFTER SURFACES ARE STABILIZED, REMOVE SILT FENCE.

TEMPORARY SEEDING RECOMMENDATIONS FOR LATE WINTER AND EARLY SPRING

SEEDING MIXTURE SPECIES	RATE (LB/ACRE)
RYE (GRAIN)	120
ANNUAL LESPEDEZA (KOBÉ IN PIEDMONT AND COASTAL PLAIN, KOREAN IN MOUNTAINS)	50

OMIT ANNUAL LESPEDEZA WHEN DURATION OF TEMPORARY COVER IS NOT TO EXCEED BEYOND JUNE.

SEEDING DATES:

MOUNTAINS	ABOVE 2500 FEET: FEB. 15 - MAY 15
	BELOW 2500 FEET: FEB. 1 - MAY 1
PIEDMONT	JAN. 1 - MAY 1
COASTAL PLAIN	DEC. 1 - APR. 15

SOIL AMENDMENTS:

FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10-10-10 FERTILIZER.

MULCH:

APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE:

REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, REFERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.

TEMPORARY SEEDING RECOMMENDATIONS FOR SUMMER

SEEDING MIXTURE SPECIES	RATE (LB/ACRE)
GERMAN MILLET	40

IN THE PIEDMONT AND MOUNTAINS, A SMALL-STEMMED SUDANGRASS MAY BE SUBSTITUTED AT A RATE OF 50 LB/ACRE.

SEEDING DATES:

MOUNTAINS:	MAY 15 - AUG. 15
PIEDMONT:	MAY 1 - AUG. 15
COASTAL PLAIN:	APR. 15 - AUG. 15

SOIL AMENDMENTS:

FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10-10-10 FERTILIZER.

MULCH:

APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE:

REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, REFERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.

TEMPORARY SEEDING RECOMMENDATIONS FOR FALL

SEEDING MIXTURE SPECIES	RATE (LB/ACRE)
RYE (GRAIN)	120

SEEDING DATES:

MOUNTAINS	AUG. 15 - DEC. 15
COASTAL PLAIN AND PIEDMONT	AUG. 15 - DEC. 30

SOIL AMENDMENTS:

FOLLOW SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 1,000 LB/ACRE 10-10-10 FERTILIZER.

MULCH:

APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE:

REPAIR AND REFERTILIZE DAMAGED AREAS IMMEDIATELY. TOPDRESS WITH 50 LB/ACRE OF NITROGEN IN MARCH. IF IT IS NECESSARY TO EXTEND TEMPORARY COVER BEYOND JUNE 15, OVERSEED WITH 50 LB/ACRE KOBÉ (PIEDMONT AND COASTAL PLAIN) OR KOREAN (MOUNTAINS) LESPEDEZA IN LATE FEBRUARY OR EARLY MARCH.

SEEDING NO. 1P FOR STEEP SLOPES OR POOR SOILS: LOW MAINTENANCE

SEEDING MIXTURE SPECIES	RATE (LB/ACRE)
TALL FESCUE	100
SERICEA LESPEDEZA	30
KOBÉ LESPEDEZA	10

SEEDING NOTES:

- IN EASTERN PIEDMONT, ADD 25 LB/ACRE PENSACOLA BAHIAGRASS OR 10 LB/ACRE COMMON BERMUDAGRASS. USE COMMON BERMUDAGRASS ONLY WHERE IT IS UNLIKELY TO BECOME A PEST.
- AFTER AUG. 15, USE UNSCARIFIED SERICEA SEED.
- WHERE A NEAT APPEARANCE IS DESIRED, OMIT SERICEA AND SUBSTITUTE 40 LB/ACRE BAHIAGRASS OR 15 LB/ACRE BERMUDAGRASS.
- TO EXTEND SPRING SEEDING DATES INTO JUNE, ADD 15 LB/ACRE HULLED BERMUDAGRASS. HOWEVER, IT IS PREFERABLE TO SEED TEMPORARY COVER AND SEED FESCUE IN SEPT.

NURSE PLANTS:

BETWEEN MAY 1 AND AUG. 15, ADD 10 LB/ACRE GERMAN MILLET OR 15 LB/ACRE SUDANGRASS. PRIOR TO MAY 1 OR AFTER AUG. 15, ADD 40 LB/ACRE RYE (GRAIN).

SEEDING DATES:

	BEST	POSSIBLE
FALL:	AUG. 25 - SEPT. 15	AUG. 20 - OCT. 25
LATE WINTER:	FEB. 15 - MAR. 21	FEB. 1 - APR. 15

FALL IS BEST FOR TALL FESCUE, AND LESPEDEZAS IN LATE WINTER. OVERSEEDING OF KOBÉ LESPEDEZA OVER FALL-SEEDED TALL FESCUE IS VERY EFFECTIVE. USE UNHULLED BERMUDAGRASS SEED IN FALL.

SOIL AMENDMENTS:

APPLY LIME AND FERTILIZER ACCORDING TO SOIL TESTS OR APPLY 4,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 1,000 LB/ACRE 10-10-10 FERTILIZER.

MULCH:

APPLY 4,000-5,000 LB/ACRE GRAIN STRAW OR EQUIVALENT COVER OF ANOTHER SUITABLE MULCHING MATERIAL. ANCHOR MULCH BY TACKING WITH ASPHALT, ROVING, OR NETTING. NETTING IS THE PREFERRED ANCHORING METHOD ON STEEP SLOPES.

MAINTENANCE:

REFERTILIZE IN THE SECOND YEAR UNLESS GROWTH IS FULLY ADEQUATE. MAY BE MOWED ONCE OR TWICE A YEAR, BUT MOWING IS NOT NECESSARY. RESEED, FERTILIZE, AND MULCH DAMAGED AREAS IMMEDIATELY.

SEEDING NO. 2P FOR GENTLE SLOPES, AVERAGE SOIL: LOW MAINTENANCE

SEEDING MIXTURE SPECIES	RATE (LB/ACRE)
TALL FESCUE	80
SERICEA LESPEDEZA	20
KOBÉ LESPEDEZA	10

SEEDING NOTES:

- AFTER AUG. 15, USE UNSCARIFIED SERICEA SEED.
- WHERE PERIODIC MOWING IS PLANNED OR A NEAT APPEARANCE IS DESIRED, OMIT SERICEA AND INCREASE KOBÉ LESPEDEZA TO 40 LB/ACRE.
- TO EXTEND SPRING SEEDING DATES INTO JUNE, ADD 15 LB/ACRE HULLED BERMUDAGRASS. HOWEVER, AFTER MID-APR. IT IS PREFERABLE TO SEED TEMPORARY COVER.

NURSE PLANTS:

BETWEEN MAY 1 AND AUG. 15, ADD 10 LB/ACRE GERMAN MILLET OR 15 LB/ACRE SUDANGRASS. PRIOR TO MAY 1 OR AFTER AUG. 15, ADD 40 LB/ACRE RYE (GRAIN).

SEEDING DATES:

	BEST	POSSIBLE
FALL:	AUG. 25 - SEPT. 15	AUG. 20 - OCT. 25
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FALL IS BEST FOR TALL FESCUE AND LATE WINTER FOR LESPEDEZAS. OVERSEEDING OF KOBÉ LESPEDEZA OVER FALL-SEEDED TALL FESCUE IS VERY EFFECTIVE.

SOIL AMENDMENTS:

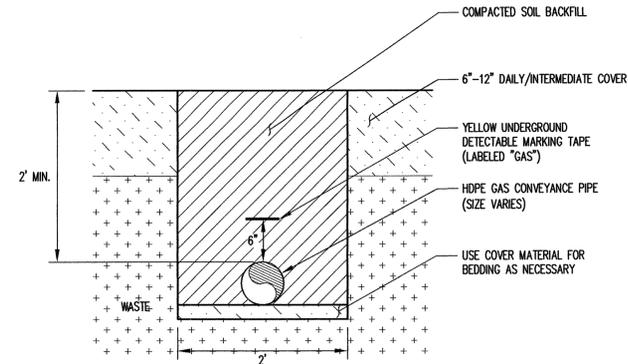
APPLY LIME AND FERTILIZER ACCORDING TO SOIL TESTS, OR APPLY 4,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 1,000 LB/ACRE 10-10-10 FERTILIZER.

MULCH:

APPLY 4,000 LB/ACRE GRAIN STRAW OR EQUIVALENT COVER OF ANOTHER SUITABLE MULCH. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR ROVING OR BY CRIMPING WITH A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE:

REFERTILIZE IN THE SECOND YEAR UNLESS GROWTH IS FULLY ADEQUATE. MAY BE MOWED ONCE OR TWICE A YEAR, BUT MOWING IS NOT NECESSARY. RESEED, FERTILIZE, AND MULCH DAMAGED AREAS IMMEDIATELY.

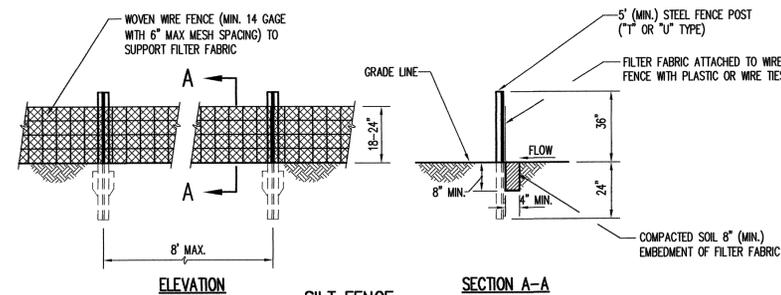


(IN WASTE)

NOTE:
1. WHERE AIR OR CONDENSATE ARE SHOWN, ALL PIPING CAN BE PLACED IN THE SAME TRENCH.

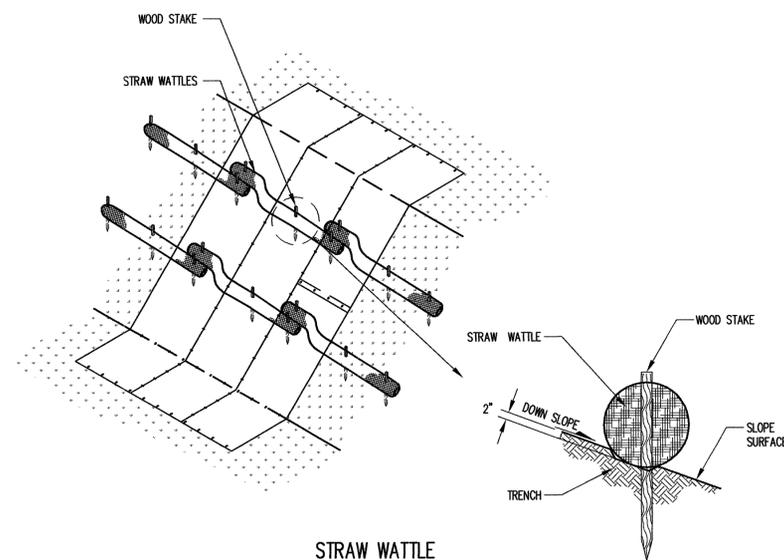
GAS CONVEYANCE PIPE TRENCH

DETAIL 1
NOT TO SCALE
EC2



SILT FENCE

DETAIL 2
NOT TO SCALE
EC2

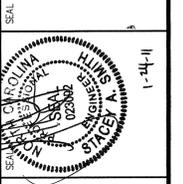


STRAW WATTLE

DETAIL 3
NOT TO SCALE
EC2

PERMIT ISSUE
NOT FOR CONSTRUCTION

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Chao, Ming-tai

From: Tom Maier [tom@rsgengineers.com]
Sent: Monday, January 24, 2011 4:51 PM
To: Idol, Joel
Cc: stacey@rsgengineers.com; amy@methanepower.net; Chao, Ming-tai; Simon.lobdell@durhamnc.gov
Subject: Erosion and Sedimentation Control Plan for Durham Landfill Gas System Expansion
Attachments: letter.Idol.012411.pdf; MP Durham E&S Plan Drawings.pdf

Joel:

Attached for your review is an electronic copy of the erosion and sedimentation control plan for the Durham Landfill Gas System Expansion. Hard copies of these documents, including two full-size sets of drawings, along with a check for \$455, will be delivered to your office shortly. We appreciate your efforts in reviewing these documents. Please contact me if you need additional information or clarification.

Thomas B. Maier
Senior Project Engineer
Richardson Smith Gardner & Associates
14 N. Boylan Ave., Raleigh, NC 27603
O: 919-828-0577
C: 919-815-0813