

Permit No.	Date	Document ID No.
32-01	December 10, 2010	12404

RECEIVED  
**December 10, 2010 via hand delivery**  
Solid Waste Section  
Raleigh Central Office



December 10, 2010

Mr. Ming Chao, P.E.  
*Environmental Engineer II*  
**NCDENR Division of Waste Management**  
**Solid Waste Section**  
1646 Mail Service Center  
Raleigh, North Carolina 27699-1646

**RE: Authorization Request for GCCS Expansion Project**  
**City of Durham Landfill (NC Solid Waste Permit No. 32-01)**  
**Durham, North Carolina**

Dear Ming:

On behalf of the City of Durham and MP Development, LLC., Richardson Smith Gardner and Associates, Inc. (RSG) is hereby providing notification of expansion of the LFG collection and control system (GCCS) at the above referenced site. Per our recent conversation, Methane Power intends to expand the existing wellfield at the site by installing eight (8) additional LFG extraction wells and constructing approximately 4,700 feet of HDPE header pipe. The proposed expansion is shown in the attached drawings entitled "Landfill Gas Collection and Control System Expansion" dated December 2010. The new wells and header pipe will connect with the existing GCCS and are intended to supply additional LFG to the existing generator.

#### **Asbestos Work Plan**

An Asbestos Work Plan will be prepared and submitted to NC DHHS/Division of Public Health. Approval documentation will be provided to the section.

#### **Existing Cover System**

The landfill is a closed facility, and includes two (2) cover sections. In the central part of the facility (with slopes less than 18%), the final cover system<sup>1</sup> includes an 18-inch thick, low-permeability, compacted soil layer; on slopes steeper than 18% the final cover system<sup>2</sup> includes 24-inches of soil cover. All disturbed areas of the final cover system will be restored to match the existing in-place conditions. RSG will provide certification and supporting documentation for all work and repairs to the landfill cover system and the existing GCCS. The information will be included in a record report following completion of construction.

#### **Material Testing**

Where appropriate, tests will be made on the materials and/or installations of components of the

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<sup>1</sup> The final cover system on slopes less than 18% is shown on Detail 4/D2 on Sheet 5 of the attached drawings.

<sup>2</sup> The final cover system on slopes steeper than 18% is shown on Detail 3/D2 on Sheet 5 of the attached drawings.

GCCS. The stone backfill in the LFG extraction wells will be tested to verify a carbonate content of less than 15% (as measured by ASTM D 4373). All pipes will be pressure tested in accordance with ASTM F 1417 to verify that no leaks are present. These test results will be submitted to NCDENR along with the other records and in the construction record report.

### Survey Documentation

Upon completion of the expansion, as-built information will be recorded by a licensed surveyor registered in the State of North Carolina documenting the layouts, details, alignments and slopes of all wells, pipes, valves, condensate traps, condensate pump stations, and other pertinent features of the GCCS. The survey will be provided in construction record report.

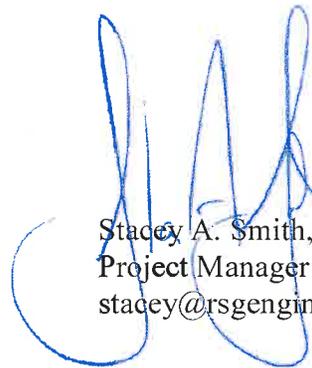
We appreciate your attention in this matter. If you have any questions, or require further information, please contact me at your convenience at (919) 828-0577, ext. 127 or by email below.

Cordially,

**Richardson Smith Gardner and Associates, Inc.**



Gregory G. Mills, P.E.  
Sr. Project Engineer  
gregm@rsgengineers.com



Stacey A. Smith, P.E.  
Project Manager  
stacey@rsgengineers.com

SAS/ggm

Att.

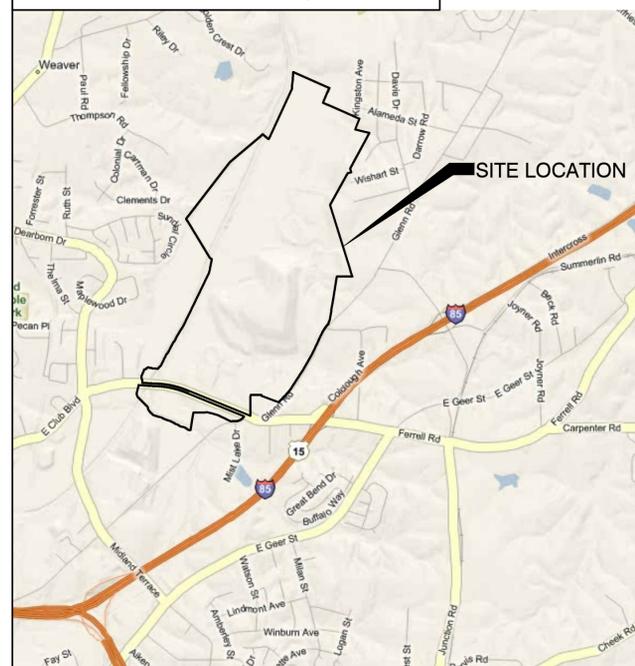
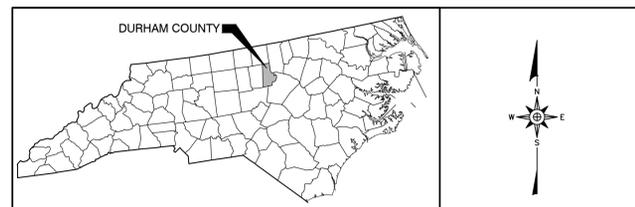
Cc: Amy Ratliff, P.E., Methane Power  
Simon Lobdell, P.E., C.E. III, City of Durham  
File

DURHAM MUNICIPAL SOLID WASTE LANDFILL FACILITY  
 DURHAM COUNTY, NORTH CAROLINA

# LANDFILL GAS COLLECTION AND CONTROL SYSTEM EXPANSION

DECEMBER 2010

REVISION
NO.
DATE



SITE LOCATION MAP  
 NOT TO SCALE

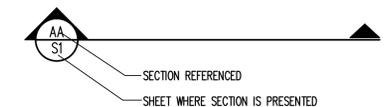
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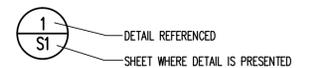
1511 NINETY SIX HIGHWAY  
 NINETY SIX, SOUTH CAROLINA  
 29666

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 GCCS DETAILS (SHEET 1 OF 3)	
7	D4	LANDFILL GCCS DETAILS (SHEET 2 OF 3)	
8	D5	LANDFILL GCCS DETAILS (SHEET 3 OF 3)	

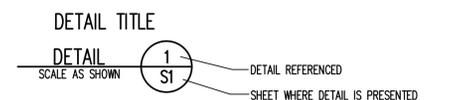
STANDARD SECTION LOCATION CALLOUT (SHEET AND DETAIL)



STANDARD DETAIL CALLOUT



STANDARD DETAIL LABEL AND CALLOUT



STANDARD REVISION CALLOUT (SHEET AND DETAIL)



DATE	NO.	REVISION DESCRIPTION	REVISION
	1		

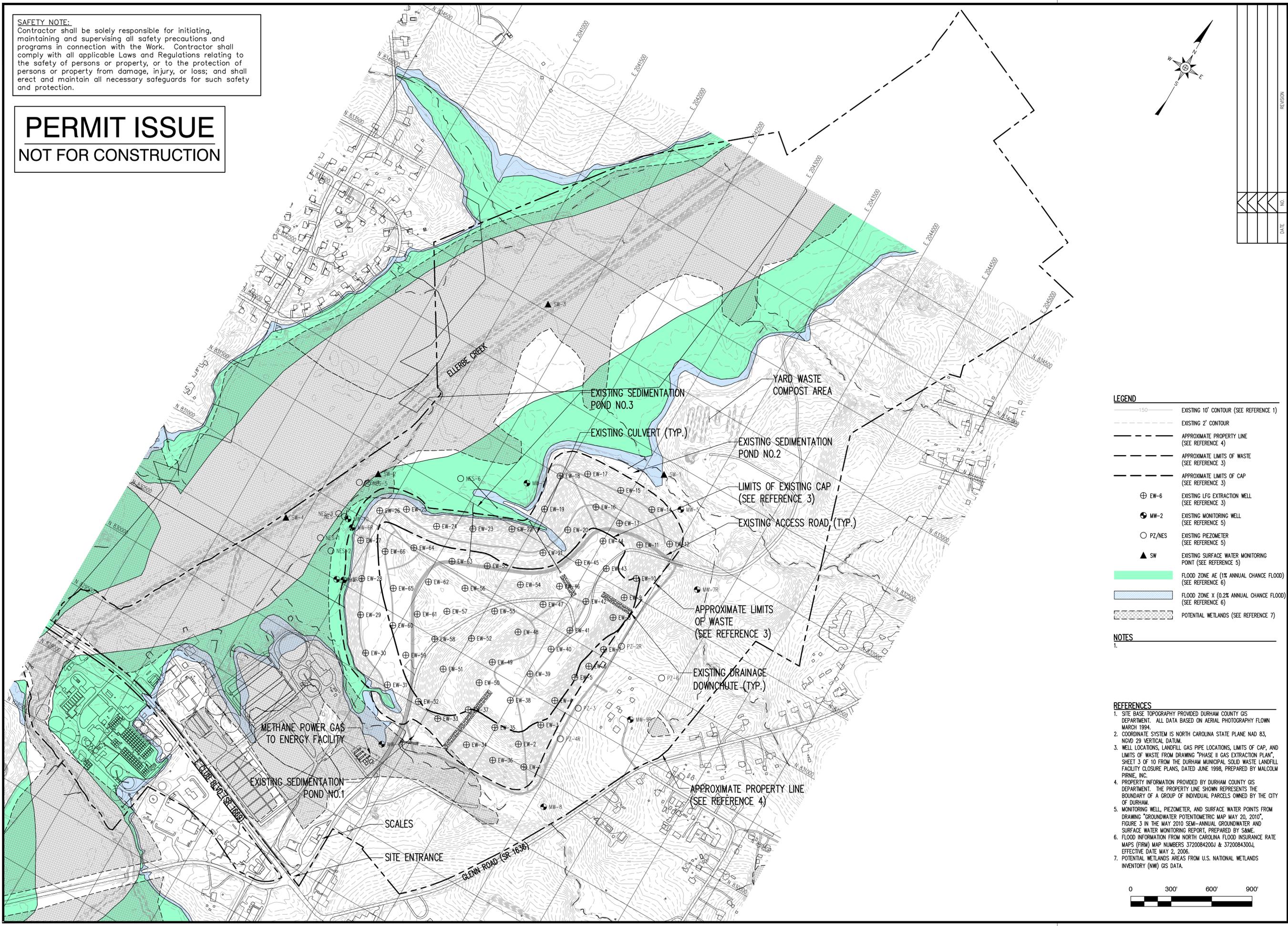
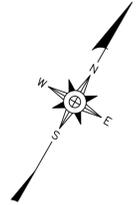
**PERMIT ISSUE**  
 NOT FOR CONSTRUCTION

**RICHARDSON SMITH GARDNER  
 & ASSOCIATES**  
 14 N. Boylan Ave. Raleigh, N.C. 27603  
 NC LIC. NO. C-0828 (Engineering) www.rsgengineers.com  
 ph: 919-828-0577 fax: 919-828-3899

**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.

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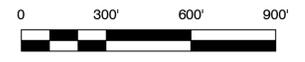
**PERMIT ISSUE  
NOT FOR CONSTRUCTION**



- 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.



PROJECT NO.	NO.	REVISION
DATE		

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

**EXISTING CONDITIONS**

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

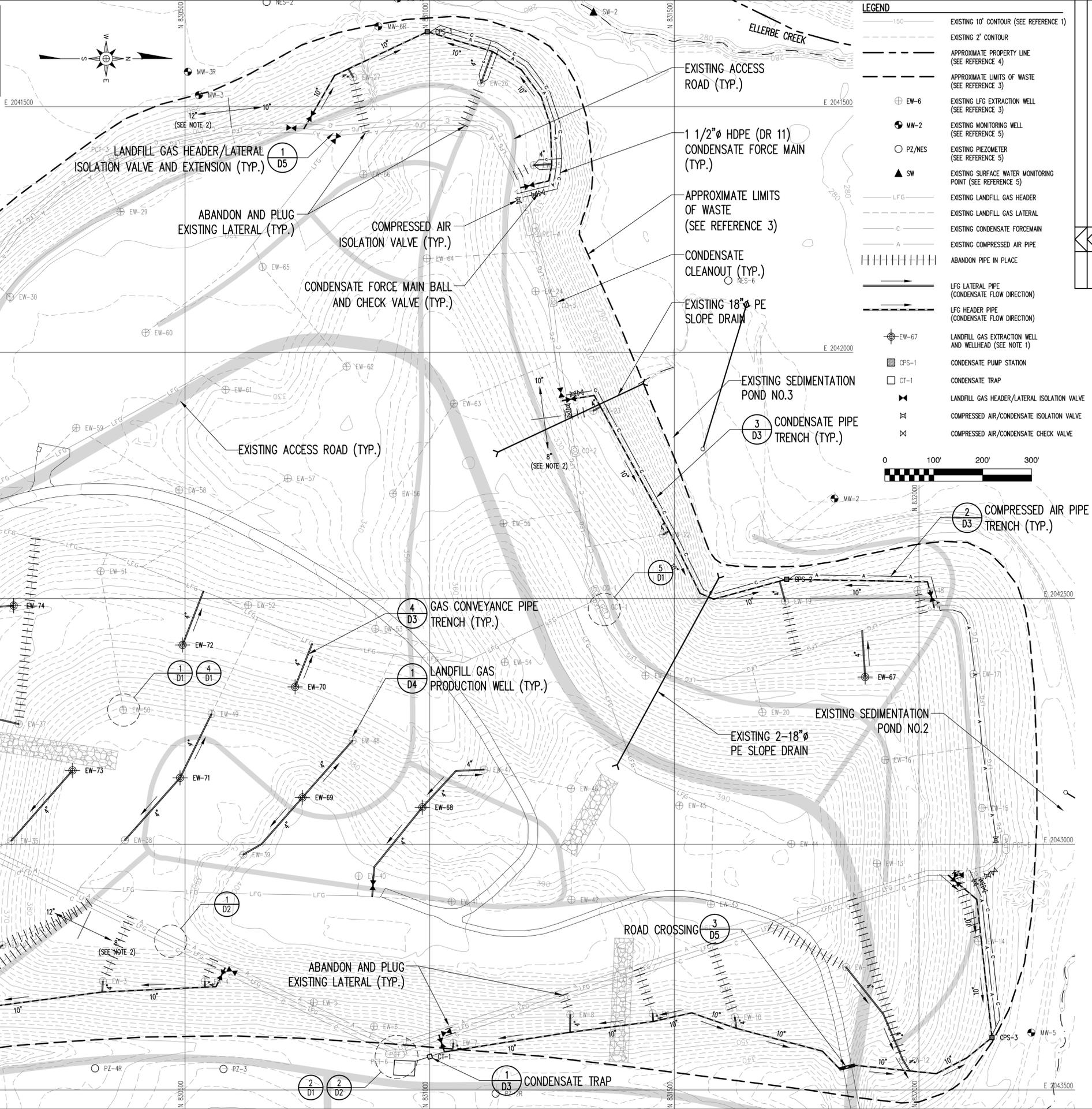
- REFERENCES**
1. SITE BASE TOPOGRAPHY PROVIDED DURHAM COUNTY GIS DEPARTMENT. ALL DATA BASED ON AERIAL PHOTOGRAPHY FLOWN MARCH 1994.
  2. COORDINATE SYSTEM IS NORTH CAROLINA STATE PLANE NAD 83, NGVD 29 VERTICAL DATUM.
  3. WELL LOCATIONS, LANDFILL GAS PIPE LOCATIONS, AND LIMITS OF WASTE FROM DRAWING "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.
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  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.

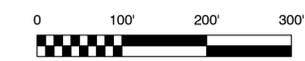
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**PERMIT ISSUE  
NOT FOR CONSTRUCTION**

**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**
- 150- EXISTING 10' CONTOUR (SEE REFERENCE 1)
  - 200- 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
  - ||||| 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



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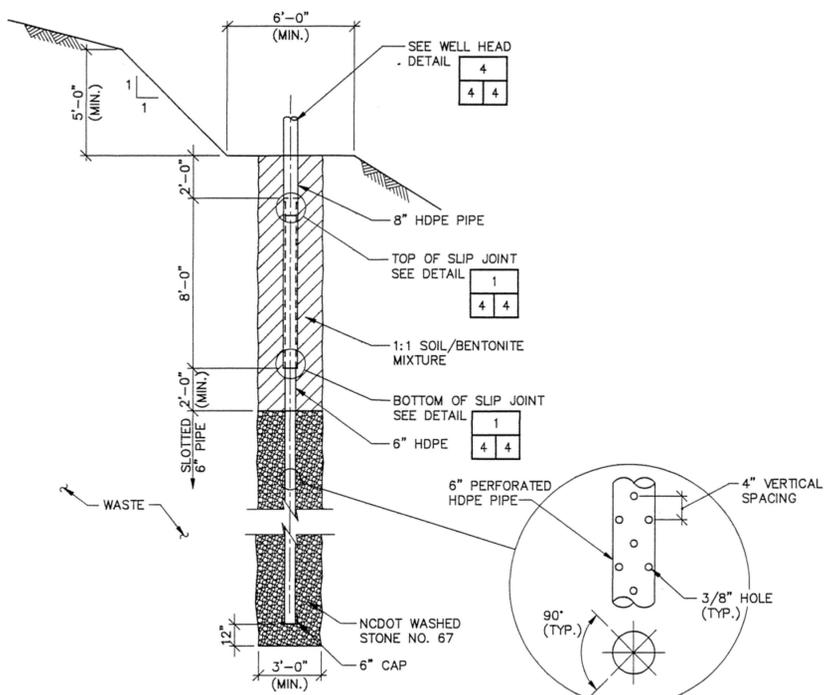
PROJECT NO.	NO.	DATE

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

**PROPOSED MODIFICATIONS TO EXISTING LANDFILL GAS COLLECTION SYSTEM**

DESIGNED BY: S.A.S.	DRAWN BY: C.T.J.
CHECKED BY:	PROJECT NO.: MPD 10-1
SCALE: AS SHOWN	DATE: DEC. 2010
FILE NAME: MPD-00007	DRAWING NO.:
<b>3</b>	<b>S3</b>

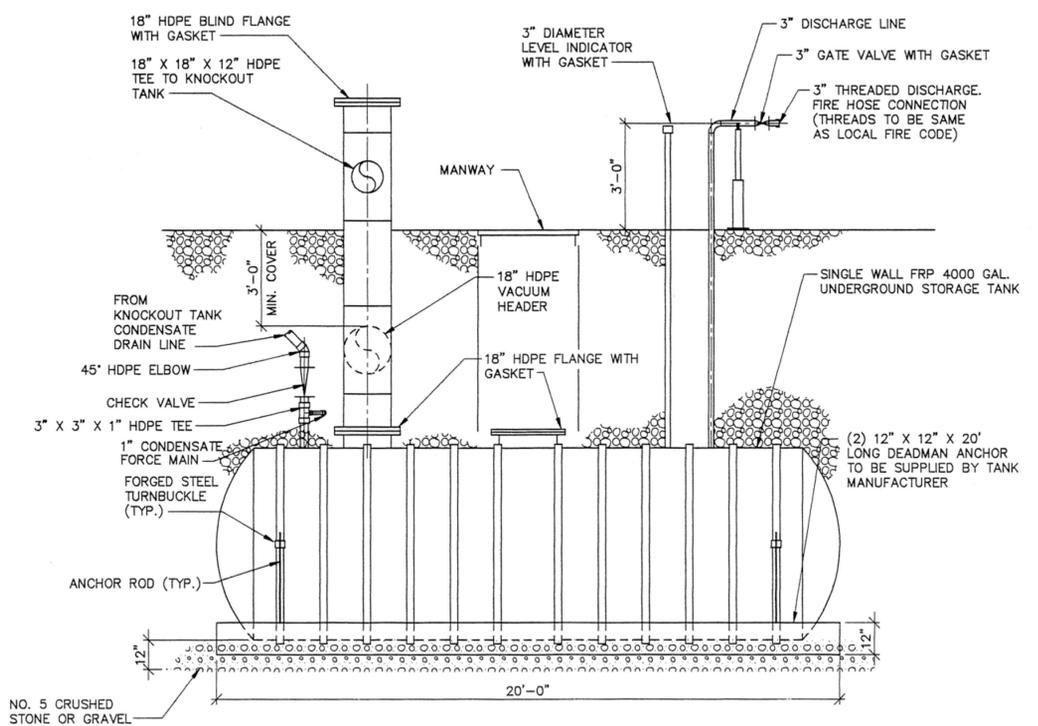
G:\CAD\MP Durham County\MPD 10-1\honest\MPD-00007.dwg - 12/29/2010 1:35 PM



- NOTES:
1. WELL DEPTHS ARE APPROXIMATE AND SHALL BE ADJUSTED UPON INSTALLATION AS NECESSARY.
  2. 1:1 SOIL/BENTONITE MIXTURE SHALL EXTEND AT LEAST 1/2 OF THE WELL DEPTH FROM THE SURFACE OR UNTIL THE DEPTH OF GROUNDWATER IS DISCOVERED, WHICHEVER IS FIRST.

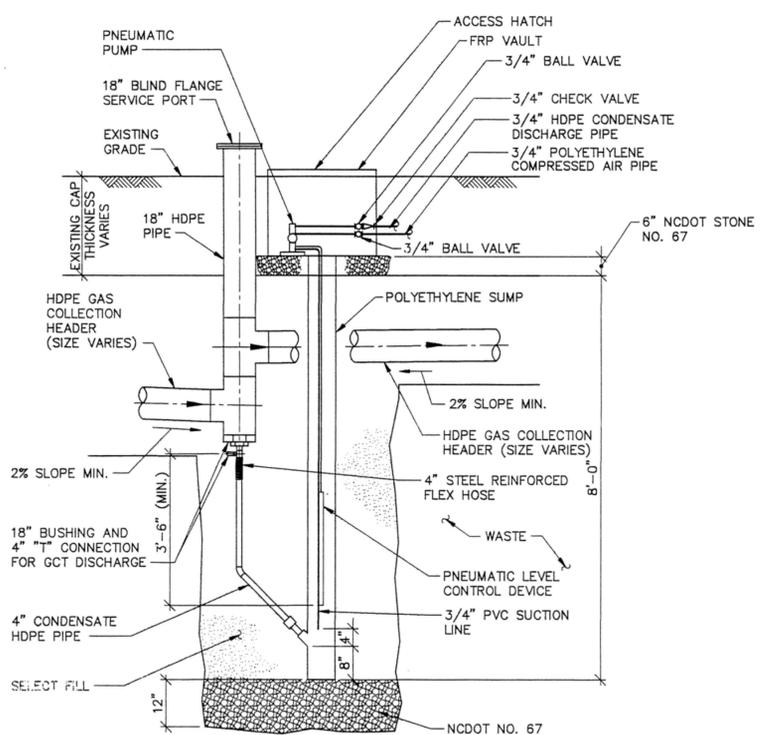
GAS EXTRACTION WELL

DETAIL 1  
NOT TO SCALE  
(SEE NOTE 1)



CONDENSATE TANK

DETAIL 2  
NOT TO SCALE  
(SEE NOTE 2)

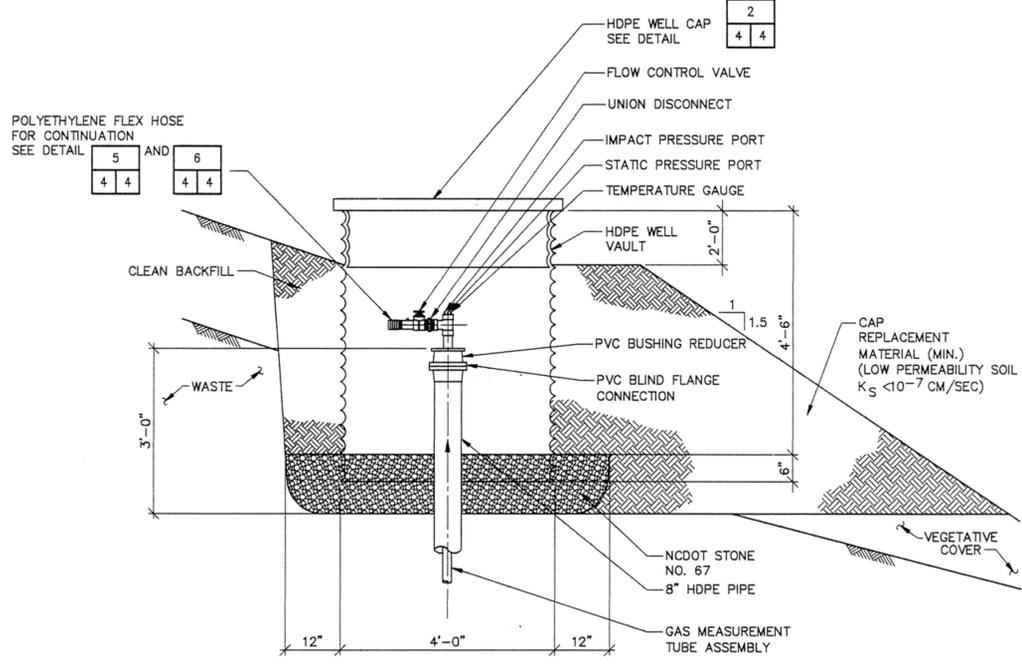


ELEVATION

NOTE: CONCRETE BALLAST REQUIRED WHERE CONDENSATE TRAP BREACHES WATER TABLE. METHOD FOR ATTACHMENT OF CONDENSATE TRAP TO CONCRETE BALLAST SHALL BE PER MANUFACTURER RECOMMENDATIONS.

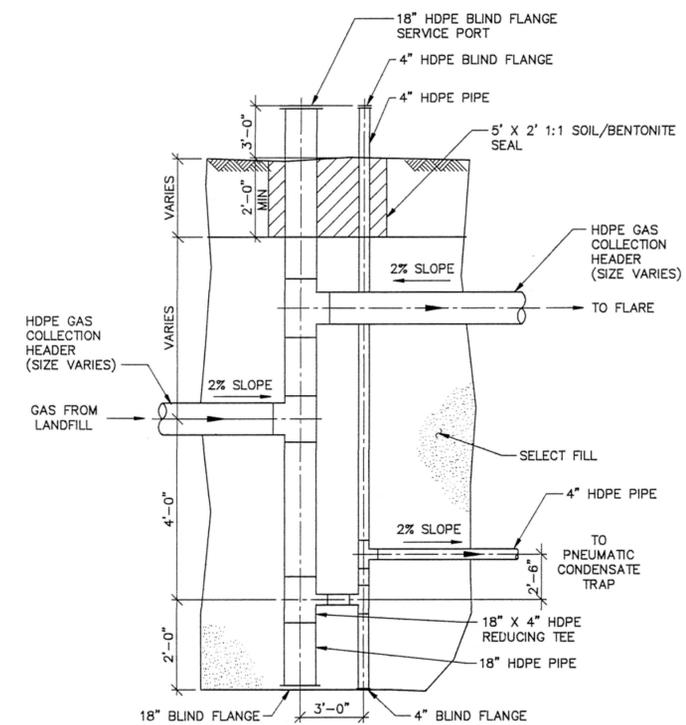
PNEUMATIC CONDENSATE TRAP

DETAIL 3  
NOT TO SCALE  
(SEE NOTE 1)



WELL HEAD AND WELL VAULT

DETAIL 4  
NOT TO SCALE  
(SEE NOTE 1)



GRAVITY CONDENSATE TRAP

DETAIL 5  
NOT TO SCALE  
(SEE NOTE 1)

**SAFETY NOTE:**  
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**PERMIT ISSUE**  
**NOT FOR CONSTRUCTION**

- NOTES
1. EXISTING DETAILS 1, 3-5 FROM DRAWING "GAS MANAGEMENT DETAILS", SHEET 4 OF 6 IN THE DURHAM MUNICIPAL SOLID WASTE FACILITY LANDFILL FACILITY CLOSURE DRAWINGS DATED SEPTEMBER 1996, PREPARED BY MALCOLM PIRNIE, INC., CHARLOTTE, NC.
  2. EXISTING DETAIL 2 FROM DRAWING "FLARE PAD PARTIAL PLAN AND DETAILS", SHEET 3 OF 6 IN THE DURHAM MUNICIPAL SOLID WASTE FACILITY LANDFILL FACILITY CLOSURE DRAWINGS DATED SEPTEMBER 1996, PREPARED BY MALCOLM PIRNIE, INC., CHARLOTTE, NC.

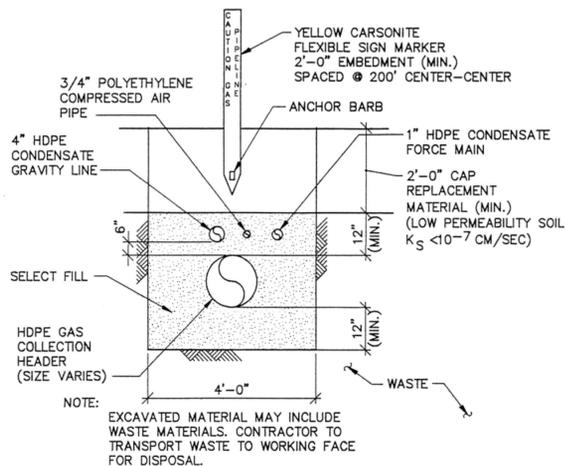
G:\CD\MP Durham County\MPD 10-10\west\MPD-00002.dwg - 12/27/10 10:41 AM

**RICHARDSON SMITH GARDNER & ASSOCIATES**  
14 N. Boylan Ave.  
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DURHAM MUNICIPAL SOLID WASTE LANDFILL FACILITY GAS COLLECTION AND CONTROL SYSTEM EXPANSION

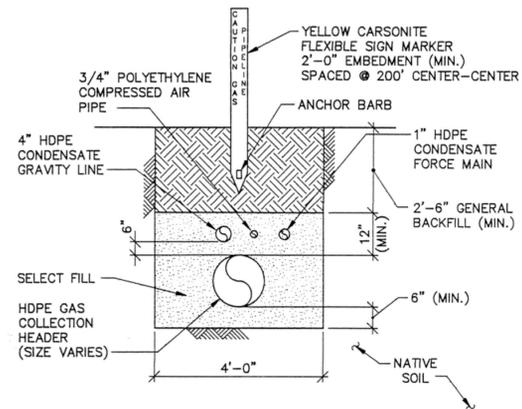
EXISTING DETAILS (SHEET 1 OF 2)

DESIGNED BY: S.A.S.	DRAWN BY: C.T.J.
CHECKED BY:	PROJECT NO.: MPD 10-1
SCALE: AS SHOWN	DATE: DEC. 2010
FILE NAME: MPD-00002	DRAWING NO.:
SHEET NO.: 4	D1



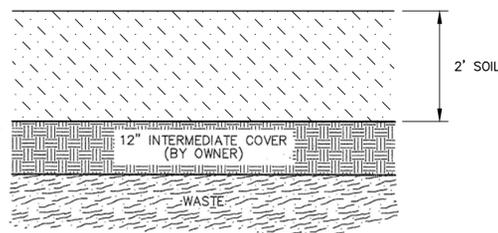
TYPICAL TRENCH INSIDE LANDFILL EXCAVATION LIMITS

DETAIL 1  
NOT TO SCALE  
(SEE NOTE 1)



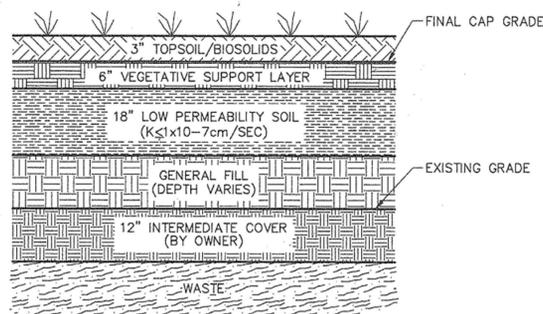
TYPICAL TRENCH OUTSIDE LANDFILL EXCAVATION LIMITS

DETAIL 2  
NOT TO SCALE  
(SEE NOTE 1)



TYPICAL CAP SYSTEM - TYPE 1

DETAIL 3  
NOT TO SCALE  
(SEE NOTE 2)



TYPICAL CAP SYSTEM - TYPE 2

DETAIL 4  
NOT TO SCALE  
(SEE NOTE 2)

- NOTES:
- FINAL GRADES SHOWN ON SITE PLAN, SHEET 2, ARE TO THE FINAL CAP GRADE SHOWN ON THIS DETAIL.
  - TOP SOIL/BIOSOLIDS SHALL ONLY BE ADDED TO TOP DECK OF LANDFILL WHERE SLOPES ARE 18% OR LESS. TOPSOIL NOT REQUIRED UNDER DRAINAGE STRUCTURES OR ROADS.
  - THE COVERAGE OF TOPSOIL/BIOSOLIDS MIX WILL BE GOVERNED BY AVAILABILITY OF BIOSOLIDS BY OWNER. THE TOPSOIL/BIOSOLIDS MIX SHALL BE 10:1 ON A VOLUMETRIC BASIS.
  - CONTRACTOR SHALL FINEGRADE EXISTING INTERMEDIATE COVER TO REGULAR SURFACE AND MAKE TWO PASSES WITH COMPACTION EQUIPMENT PRIOR TO PLACING GENERAL FILL OR CAP.

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**PERMIT ISSUE**  
**NOT FOR CONSTRUCTION**

- NOTES**
- EXISTING DETAILS 1 & 2 FROM DRAWING "GAS MANAGEMENT DETAILS", SHEET 4 OF 6 IN THE DURHAM MUNICIPAL SOLID WASTE FACILITY LANDFILL FACILITY CLOSURE DRAWINGS DATED SEPTEMBER 1996, PREPARED BY MALCOLM PIRNIE, INC., CHARLOTTE, NC.
  - EXISTING DETAIL 4 FROM DRAWING "STORMWATER AND CAP SYSTEM DETAILS", SHEET 7 OF 10 IN THE DURHAM MUNICIPAL SOLID WASTE FACILITY LANDFILL FACILITY CLOSURE DRAWINGS DATED JUNE 1998, PREPARED BY MALCOLM PIRNIE, INC., CHARLOTTE, NC.

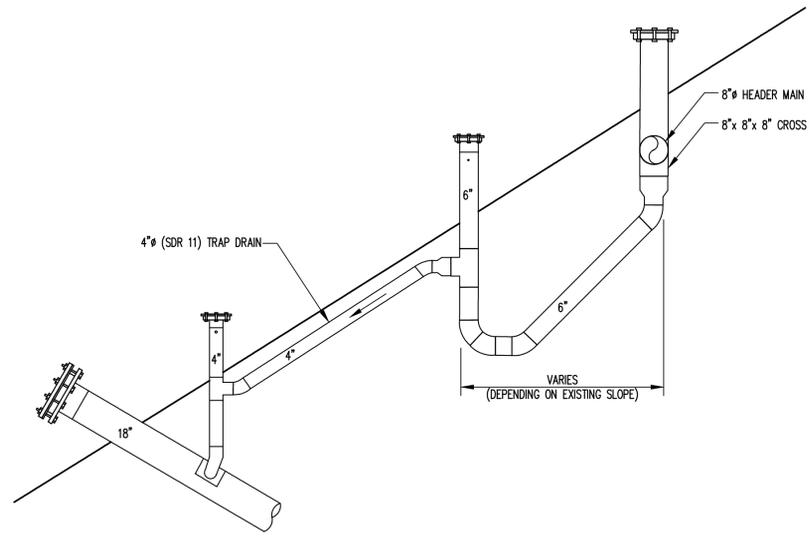
REVISION	NO.	DATE

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

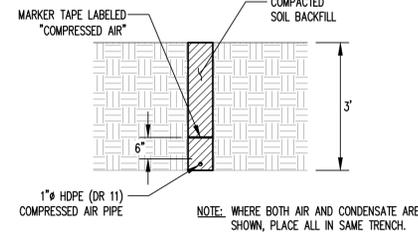
EXISTING DETAILS  
(SHEET 2 OF 2)

DESIGNED BY: S.A.S.	DRAWN BY: C.T.J.
CHECKED BY:	PROJECT NO.: MPD 10-1
SCALE: AS SHOWN	DATE: DEC. 2010
FILE NAME: MPD-00009	
SHEET NO. 5	DRAWING NO. D2



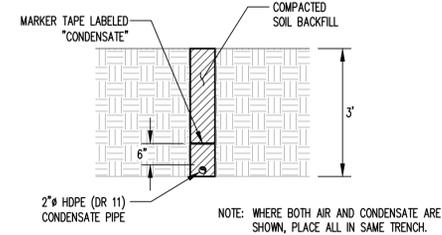
CONDENSATE TRAP

DETAIL 1  
NOT TO SCALE D3



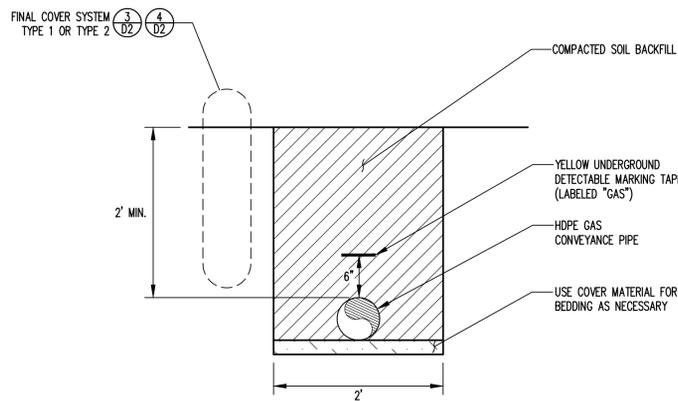
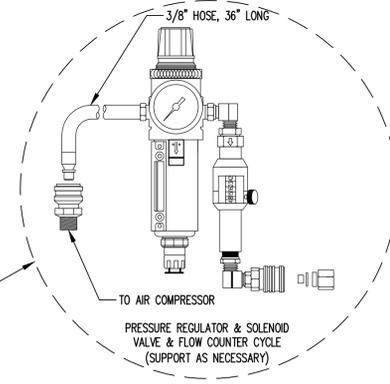
COMPRESSED AIR PIPE TRENCH

DETAIL 2  
NOT TO SCALE D3



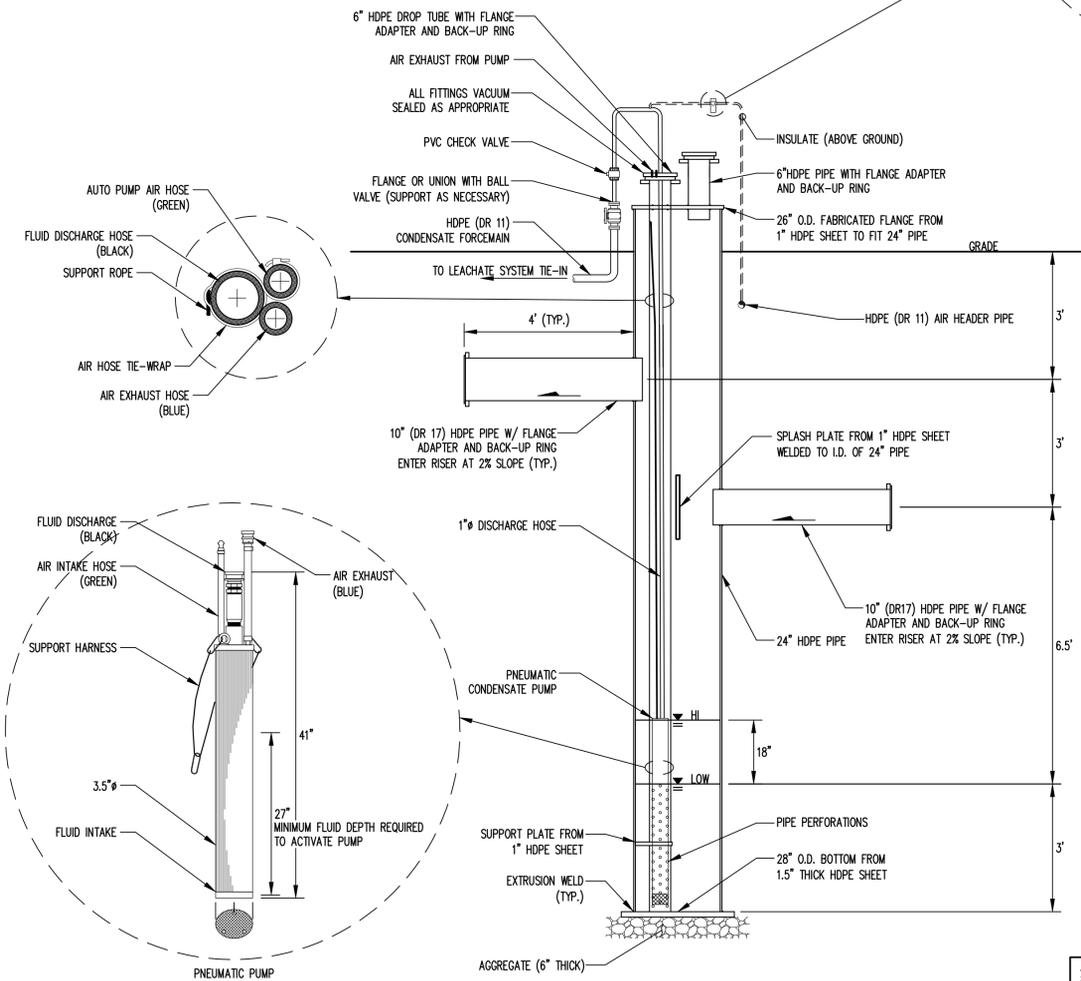
CONDENSATE PIPE TRENCH

DETAIL 3  
NOT TO SCALE D3



GAS CONVEYANCE PIPE TRENCH

DETAIL 4  
NOT TO SCALE D3



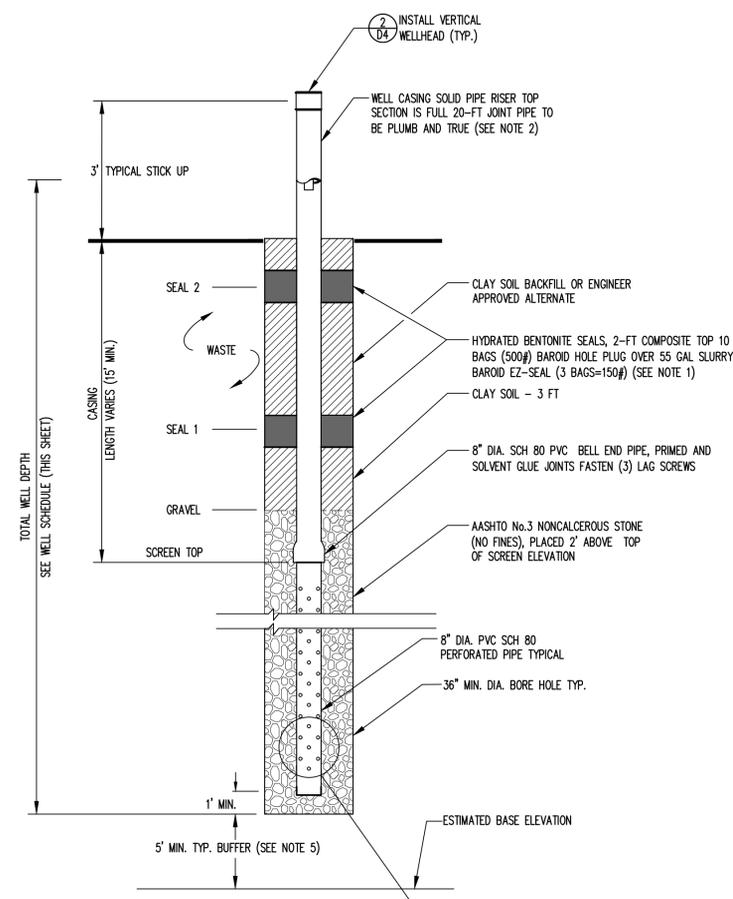
CONDENSATE PUMPING STATION

DETAIL 5  
NOT TO SCALE D3

**PERMIT ISSUE**  
**NOT FOR CONSTRUCTION**

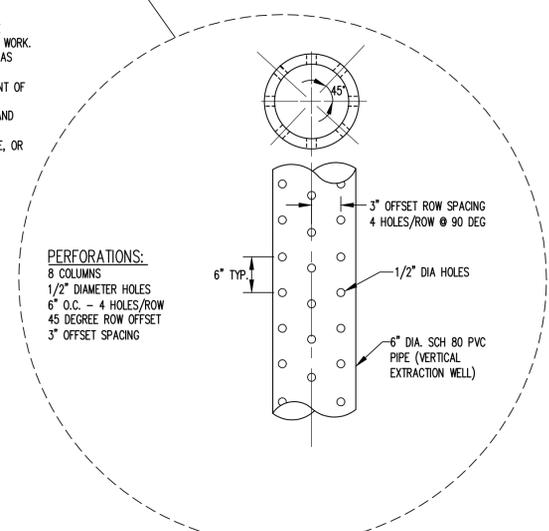
**SAFETY NOTE:**  
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DESIGNED BY: S.A.S.	DRAWN BY: C.T.J.
CHECKED BY:	PROJECT NO.: MPD 10-1
SCALE: AS SHOWN	DATE: DEC. 2010
FILE NAME: MPD-00004	DRAWING NO.:
SHEET NO. <b>6</b>	DRAWING NO. <b>D3</b>



- NOTES**
- ADDITIONAL BENTONITE SEALS (AND SOLID CASING SECTIONS) MAY BE REQUIRED TO ISOLATE PERCHED LEACHATE ZONES AS SUPPLEMENTAL WORK.
  - DEWATERING AFTER SETTING CASING MAY BE DIRECTED BY ENGINEER AS SUPPLEMENTAL WORK.
  - A STICKUP OF 3' ABOVE FINAL COVER SHALL BE LEFT FOR PLACEMENT OF WELL HEAD.
  - EACH WELL LOCATION SHALL BE SURVEYED PRIOR TO INSTALLATION AND APPROVED BY THE ENGINEER.
  - DRILLING TO STOP 5' ABOVE GROUNDWATER POTENTIOMETRIC SURFACE, OR WHEN SOIL IS ENCOUNTERED, WHICHEVER OCCURS FIRST.

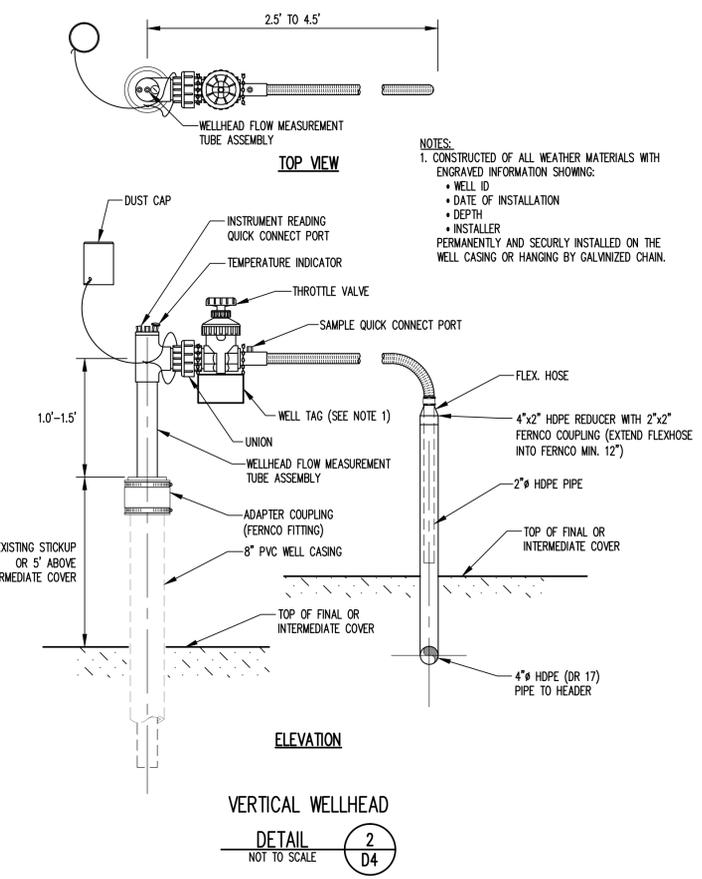
**LANDFILL GAS PRODUCTION WELL**  
 DETAIL 1  
 NOT TO SCALE



**WELL DRILLING SCHEDULE (SEE NOTE 4)**

WELL DESIGNATION	RSG POINT NO.	NORTHING	EASTING	EST. GROUND ELEVATION (FT) (REF. 1)	EST. BAE ELEVATION (FT) (REF. 3)	APPROX. BOREHOLE DEPTH (FT)
EW-1	1	830000.55	2043324.68	344.01	307.97	
EW-2	2	830126.80	2043205.36	367.80	310.05	
EW-3	3	830332.31	2043278.71	368.98	313.36	
EW-4	4	830540.24	2043279.16	373.86	313.36	
EW-5	5	830762.96	2043322.07	367.03	313.57	
EW-6	6	830886.28	2043370.87	357.38	315.16	
EW-7	7	831048.51	2043404.31	354.52	316.84	
EW-8	8	831287.26	2043346.71	371.53	313.31	
EW-9	9	831455.84	2043344.50	369.85	309.45	
EW-10	10	831623.55	2043351.63	364.62	304.66	
EW-11	11	831850.74	2043250.06	372.33	296.97	
EW-12	12	831967.25	2043438.78	332.73	296.22	
EW-13	13	831913.79	2043039.18	362.20	291.98	
EW-14	14	832121.14	2043197.66	316.09	289.63	
EW-15	15	832128.51	2042926.55	314.91		
EW-16	16	831930.33	2042828.63	352.71	287.91	
EW-17	17	832111.26	2042653.88	316.83		
EW-18	18	831996.70	2042483.69	309.73		
EW-19	19	831726.27	2042506.02	302.78	286.64	
EW-20	20	831679.75	2042731.79	351.37	291.48	
EW-21	21	831440.85	2042657.28	352.13	293.60	
EW-22	22	831476.99	2042370.21	313.07	287.44	
EW-23	23	831334.33	2042118.48	318.00	284.38	
EW-24	24	831216.18	2041875.65	319.95	282.14	
EW-25	25	831212.70	2041619.11	317.35		
EW-26	26	831105.03	2041452.37	316.52		
EW-27	27	830843.67	2041440.16	305.80		
EW-28	28	830604.48	2041587.54	315.81	282.84	
EW-29	29	830368.17	2041713.84	319.94	285.29	
EW-30	30	830142.23	2041887.16	320.21	287.53	
EW-31	31	830019.33	2042145.43	321.80	291.23	
EW-32	32	830027.36	2042405.00	318.10	295.90	
EW-33	33	829990.32	2042593.02	325.34	299.11	
EW-34	34	829929.89	2042873.83	332.95	302.75	
EW-35	35	830144.91	2042993.28	367.68	307.07	
EW-36	36	829928.13	2043099.63	339.91	304.47	
EW-37	37	830160.20	2042755.68	361.62	302.71	
EW-38	38	830377.02	2042991.95	387.41	307.73	
EW-39	39	830618.96	2043021.31	395.11	308.05	
EW-40	40	830854.96	2043064.73	400.47	307.19	
EW-41	41	831044.98	2043116.87	400.49	307.59	
EW-42	42	831289.54	2043112.94	398.00	306.55	
EW-43	43	831574.83	2043121.98	390.93	301.85	
EW-44	44	831738.85	2042999.60	391.56	295.47	
EW-45	45	831510.15	2042921.48	391.31	298.60	
EW-46	46	831288.77	2042887.06	387.33	300.20	
EW-47	47	831111.27	2042848.45	373.61	300.50	
EW-48	48	830842.42	2042789.37	372.19	301.78	
EW-49	49	830554.08	2042735.22	379.71	302.76	
EW-50	50	830373.65	2042726.68	382.70	302.80	
EW-51	51	830327.35	2042444.87	346.26	297.43	
EW-52	52	830628.86	2042513.82	346.41	298.13	
EW-53	53	830888.75	2042562.17	343.24	297.04	
EW-54	54	831153.27	2042629.88	364.98	295.69	
EW-55	55	831150.82	2042347.60	357.73	290.61	
EW-56	56	830925.10	2042287.07	343.59	291.61	
EW-57	57	830710.20	2042256.00	335.92	292.66	
EW-58	58	830487.93	2042280.18	325.45	294.16	
EW-59	59	830277.60	2042153.39	322.98	291.91	
EW-60	60	830419.25	2041959.85	322.72	288.54	
EW-61	61	830582.54	2042075.77	330.07	289.83	
EW-62	62	830830.28	2042028.64	338.13	287.76	
EW-63	63	831049.40	2042103.99	347.83	287.15	
EW-64	64	830994.02	2041808.94	335.72	283.19	
EW-65	65	830658.41	2041826.18	320.92	285.69	
EW-66	66	830864.27	2041637.59	318.63	282.05	
EW-67	400	831890.00	2042660.00	343.48	286.00	
EW-68	401	830985.00	2042925.00	379.35	303.17	
EW-69	402	830740.00	2042905.00	399.63	304.90	
EW-70	403	830725.00	2042680.00	360.30	300.69	
EW-71	404	830490.00	2042865.00	386.61	305.47	
EW-72	405	830495.00	2042595.00	356.50	300.24	
EW-73	406	830270.00	2042850.00	386.15	304.81	
EW-74	407	830150.00	2042515.00	349.67	298.35	

- REFERENCES**
- ESTIMATED GROUND ELEVATIONS FROM TOPOGRAPHY PROVIDED DURHAM COUNTY GIS DEPARTMENT. ALL DATA BASED ON AERIAL PHOTOGRAPHY FLOWN MARCH 1994.
  - COORDINATE SYSTEM IS NORTH CAROLINA STATE PLANE NAD 83, NGVD 29 VERTICAL DATUM.
  - ESTIMATED BASE ELEVATIONS FROM GROUNDWATER POTENTIOMETRIC SURFACE PRESENTED IN DRAWING "GROUNDWATER POTENTIOMETRIC MAP MAY 20, 2010" SHEET 3 OF 3, DATED JUNE 2010, PREPARED BY S&ME, INC., RALEIGH, NORTH CAROLINA.



- NOTES**
- CONSTRUCTED OF ALL WEATHER MATERIALS WITH ENGRAVED INFORMATION SHOWING:
    - WELL ID
    - DATE OF INSTALLATION
    - DEPTH
    - INSTALLER
 PERMANENTLY AND SECURELY INSTALLED ON THE WELL CASING OR HANGING BY GALVANIZED CHAIN.

**VERTICAL WELLHEAD**  
 DETAIL 2  
 NOT TO SCALE

**PERMIT ISSUE**  
 NOT FOR CONSTRUCTION

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 14 N. Boylan Ave.  
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 www.rsgengineers.com  
 ph: 919-228-0577  
 fax: 919-228-3899

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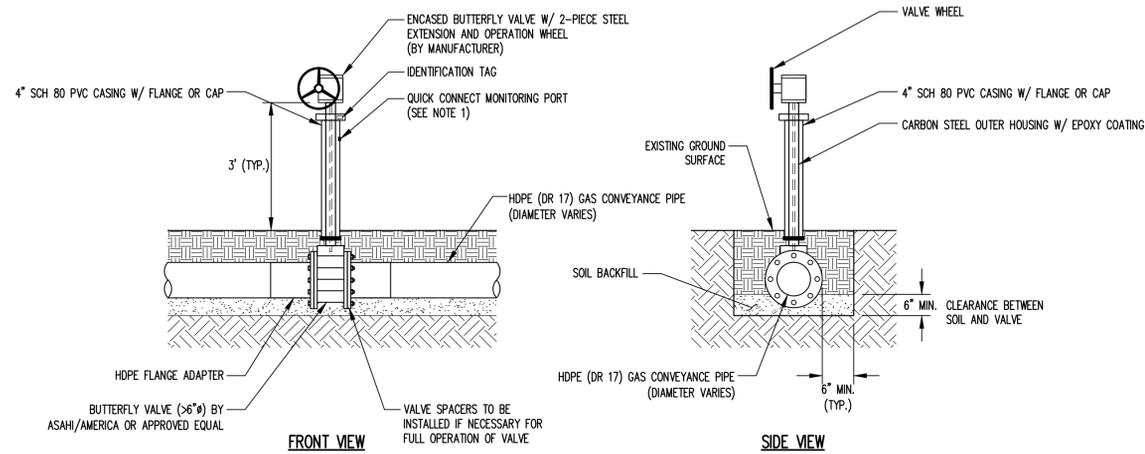
**DURHAM MUNICIPAL SOLID WASTE LANDFILL FACILITY GAS COLLECTION AND CONTROL SYSTEM EXPANSION**

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**LANDFILL GCCS DETAILS (SHEET 2 OF 3)**

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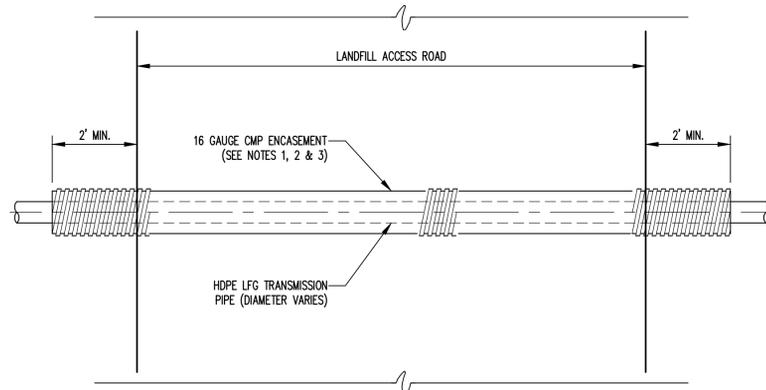
DESIGNED BY: S.A.S.	DRAWN BY: C.T.J.
CHECKED BY:	PROJECT NO.:
SCALE:	MPD 10-1
AS SHOWN	DATE: DEC. 2010
FILE NAME: MPD-00005	DRAWING NO.:
7	D4



NOTE:  
1. MONITORING PORT SHALL BE MANUFACTURED BY COLDER PRODUCTS COMPANY PMCD 12 SERIES QUICK CONNECT COUPLINGS OR EQUIVALENT.

ISOLATION VALVE AND EXTENSION

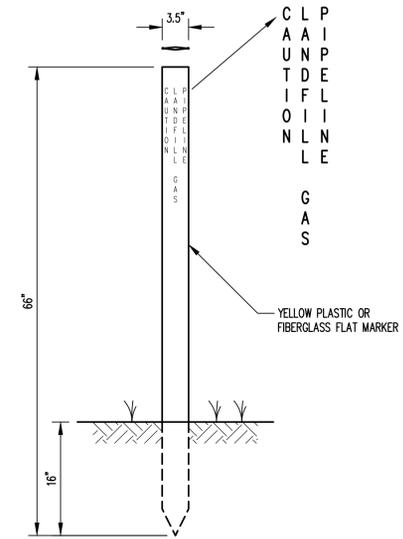
DETAIL 1  
NOT TO SCALE D5



NOTES:  
1. CMP ENCASEMENT DIAMETER SHALL BE AT LEAST 1.5x GAS PIPE DIAMETER.  
2. MIN. 1.5 FT. COVER REQUIRED OVER CMP.  
3. CONTRACTOR SHALL RESTORE ROAD TO ORIGINAL CONDITION, INCLUDING AGGREGATE SURFACING.

PIPE ENCASEMENT AT ROAD CROSSING

DETAIL 3  
NOT TO SCALE D5



LFG LINE MARKER

DETAIL 2  
NOT TO SCALE D5

**PERMIT ISSUE**  
NOT FOR CONSTRUCTION

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REVISION	NO.	DATE

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

DRAWING TITLE:  
**LANDFILL GCCS DETAILS (SHEET 3 OF 3)**

DESIGNED BY: S.A.S.	DRAWN BY: C.T.J.
CHECKED BY:	PROJECT NO.: MPD 10-1
SCALE: AS SHOWN	DATE: DEC. 2010
FILE NAME: MPD-00006	SHEET NO. DRAWING NO.
<b>8</b>	<b>D5</b>