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SOLID WASTE SECTION
REGIONAL OFFICE

McGill
ASSOCIATES

February 25, 2011

Fac/Perm/Co ID #	Date	Doc ID#
44-07	3,2,11	13086

Mr. Allen Gaither, PE
Regional Engineer
Solid Waste Permitting Section
Division of Waste Management
North Carolina Department of Environment and Natural Resources
2090 U.S. Highway 70
Swannanoa, North Carolina 28778

RE: Landfill Gas Monitoring Plan
White Oak Municipal Solid Waste Landfill
Permit # 44-07
Haywood County, North Carolina

Dear Mr. Gaither:

On behalf of Haywood County, North Carolina, McGill Associates would like to take this opportunity to respond to Mr. Barbee's comments outlined in his letter to Mr. Stephen King dated September 29, 2010, Document I.D. 11610. The comments were relative to the revised Explosive Gas Control Plan for White Oak MSW Landfill, Permit No. 44-07, submitted to the Solid Waste Section in a letter to Ms. Andrea Keller dated July 12, 2010.

The Explosive Gas Control Plan, Appendix 3, for the Haywood County White Oak Landfill, submitted per the aforementioned letter to Ms. Andrea Keller, was the approved Explosive Gas Control Plan per the Permit To Operate, White Oak Municipal Solid Waste Landfill and Permit to Construct, Municipal Solid Waste Landfill Phase 3, Permit No. 44-07, dated October 7, 2009, Document I.D. 8720. Basically, the only revisions to this plan submitted July 12, 2010 were the inclusion of a site map delineating the location of the existing and proposed landfill gas monitoring wells and methane monitoring points, the landfill gas monitoring reporting form and the proposed landfill gas monitoring probe construction diagram. Based on several of the review comments, Haywood County is amenable to modifying applicable portions of the wording of this approved document to generally comply with the comments contained in Mr. Barbee's letter dated September 29, 2010, Document I.D. 11610. However, in doing so, the County takes the position that the changes/modifications are for clarification purposes only and do not constitute a general revision, update or modification of the existing approved Explosive Gas Control Plan.

In response to Mr. Barbee's specific comment that "well depths will extend to the seasonal high groundwater elevation and the entire vadose zone, including bedrock above the water table will be screened", the County's opinion is as follows. The County's landfill is designed with a synthetic membrane base liner underlain with applicable thicknesses of compacted low permeability soil to prevent contaminants from leaking through and impacting the groundwater. This same synthetic membrane base liner will prevent the migration of landfill gas through and into the adjacent subsurface soils. The primary explosive component of landfill gas is methane which is lighter than air. Methane does not generally migrate downward but will attempt to escape vertically upward or may travel horizontally through any pathway or permeable *in situ* soil. It is also known that landfill gases move from areas of high pressure to areas of lower pressure through the path of least resistance. Within the landfill's waste mass the gas may migrate laterally; however, at some point the gases must migrate vertically in order to exit the lined landfill area. Since the synthetic membrane is anchored at or near the surrounding surface of the existing terrain, the landfill gas that does not exit the landfill through the cap system may follow the membrane liner upwards and generally vent to the environment at or near the edge of the anchor trench. Given that any landfill gas that may migrate beyond the perimeter anchor trench of the lined cells would only be a couple of feet below the surrounding surface at the initial point of migration, it is highly unlikely that it would travel far before venting to the atmosphere. In addition, the topography surrounding the disposal areas acts as a natural barrier minimizing the possibility of landfill gas migrating much beyond the edge of the anchor trench. The landfill cells are generally bounded by drainage channels, downward sloping terrain or valleys that are equal to or lower in elevation than the adjacent top of the synthetic membrane anchor trench. In addition, the ground elevation at the majority of the landfill gas monitoring wells is generally well below the elevation of the anchor trenches. This has the same effect as placing a much deeper monitoring well immediately adjacent to a cell's anchor trench. However, should the landfill gas, under the most extreme circumstances, migrate away from the edge of the anchor trench, it will generally be a very shallow migration and will be detected in the six-foot (6') deep landfill gas monitoring wells. The County is therefore of the opinion that the site conditions at the Haywood County MSW Landfill do not warrant the drilling of methane monitoring wells to the depth equivalent to the seasonal high groundwater elevation. The landfill gas monitoring wells installed at a depth of approximately six-feet (6') below the surface should provide more than adequate detection of migrating landfill gas should that occur.

The spacing and number of the existing and proposed landfill gas monitoring wells, approved as a part of the afore referenced Permit To Operate and Permit To Construct are generally within a lateral spacing of no more than five hundred feet (500') and no further than two hundred fifty feet (250') from the waste boundary. Exceptions to the location criteria are due solely to the topography of the surrounding terrain and the need to provide access to the wells in order to facilitate installation and conduct monitoring activities.

The detail of the landfill gas monitoring well will be modified to change the title from "Landfill Gas Monitoring Probe" to "Landfill Gas Monitoring Well" to comply with the general change in wording requests as noted in Mr. Barbee's afore referenced comment letter. However, for the reasons stated above, the County is of the opinion that the monitoring well, as shown on the detail, is more than adequate to meet the landfill gas monitoring requirements for the White Oak MSW Landfill site.

A revised copy of the Haywood County White Oak Landfill Operations Plan, Appendix 3, Explosive Gas Control Plan is enclosed for your review.

The County has completed the installation of the landfill gas monitoring wells, as per the general locations in the Permit To Operate, White Oak Municipal Solid Waste Landfill and Permit to Construct, Municipal Solid Waste Landfill Phase 3, Permit No. 44-07, dated October 7, 2009. The landfill gas monitoring wells were installed in general conformance with the detail initially titled "Landfill Gas Monitoring Probe". An as-built drawing of the completed environmental monitoring infrastructure at the White Oak MSW Landfill is enclosed.

On behalf of the County we appreciate your consideration of our position relative to the comments pertaining to the approved Explosive Gas Control Plan. Should you have any questions or require additional information please give us a call.

Sincerely,
McGILL ASSOCIATES, P.A.

JEFFREY R. BISHOP, PE
Director of Solid Waste Services

Enclosures

cc: Mr. Stephen King, Haywood County Solid Waste Director, w/enc

HAYWOOD COUNTY
WHITE OAK LANDFILL
OPERATIONS PLAN

APPENDIX 3
EXPLOSIVE GAS CONTROL PLAN

Original Plan by Municipal Engineering, March 2000
Revised July 2010 to include reference drawings
Revised February 2011

Appendix 3

EXPLOSIVE GAS CONTROL PLAN FOR - HAYWOOD COUNTY

Quarterly the Haywood County landfill will monitor for methane and other explosive landfill gases within the landfill structures and at the landfill gas monitoring wells, as shown on attached Figure 1. The permanent landfill gas monitoring wells (monitoring well) will consist of a plastic stand pipe similar to a piezometer used for groundwater detection. A typical permanent landfill gas monitoring well is detailed in the attached Figure 2. The permanent probe will be constructed at a minimum depth of six (6) feet. A minimum 6" diameter hole will contain a one (1) inch slotted PVC pipe. The bottom two (2) feet will be backfilled with non-carbonate pea gravel with a bentonite seal one (1) foot thick above it. The remaining three (3) feet will be backfilled with *in situ* soils. The one (1) inch PVC pipe will be approximately three (3) feet above the existing grade. The PVC pipe will be capped with a one (I) inch PVC cap, one quarter (1/4) inch NPT hose barb, and 1" tubing, plugged or capped to prevent contamination. A minimum four inch (4") diameter schedule 40 PVC sleeve or aluminum/steel prefabricated well cover will be placed over the one inch (1") pipe and filled with clean masonry sand to within four inches (4") of the one inch (1") schedule 40 PVC cap. The top of the PVC pipe sleeve or prefabricated well cover will be secured with a removable water tight cap. Where necessary, a marker post will be placed in close proximity to the landfill gas monitoring well. A permanent well I.D. will be placed/painted on the marker post or the well cover. The County is also required to perform quarterly monitoring at all existing and future on-site structures. Currently, the on-site structures include the Maintenance Building and the Scale House.

The location and spacing of the landfill gas monitoring wells are strategically located in accordance with the approved Permit To Operate, White Oak Municipal Solid Waste Landfill and the Permit To Construct, Municipal Solid Waste Landfill Phase 3, Permit No. 44-07, dated October 7, 2009, Document I.D. 8720.

The migration of methane and other explosive landfill gases (landfill gas) is induced by pressure gradients. The landfill gases will move from areas of high pressure to those of low pressure following the path of least resistance. Landfill gas will generally migrate vertically until it reaches the landfill surface where it may begin to flow horizontally until it finds a pathway out through the permeable in situ soils or a landfill gas venting/extraction system. Given that Haywood County's landfill is designed with a synthetic membrane base liner system there should be no landfill gas migration into or through the subsurface permeable *in situ* soils. The final cap system, once designed and installed, will also contain a synthetic membrane liner system with a landfill gas venting/extraction system. This type of cap system will also prevent the migration of landfill gas into or through the surrounding permeable *in situ* soils.

Since methane, a component of landfill gas, is lighter than air, it wants to escape into the atmosphere. Experience has shown that whenever gas is migrating no matter what the spacing or depth of the monitoring probes, the gas will fill the void created by the monitoring well and an explosive gas detection meter will monitor the level of concentration. The six foot depth of the monitoring wells is to ensure a stable monitoring point. The only time a shallow monitoring well has not worked is in a very heavy, impermeable clay layer that acts as a seal to the migration of

the gas. If a clay layer is encountered during the construction of a monitoring well, it will either be moved beyond the clay or excavated to a depth that is in the conductive zone below the clay.

The landfill gas can be detected by use of an instrument that reports the percent of lower explosive limit (% LEL) and the methane gas concentration (% CH_4). The instrument being used is the LandGEM 2000. Observations for the landfill gas monitoring wells will be recorded on the attached form titled "Landfill Gas Measurements Field Worksheet, White Oak MSW Landfill, Haywood County, North Carolina". Observations for the on-site structures will also be recorded on the attached form.

Quarterly, a County employee or contractor for the County will visit each landfill gas monitoring well. . Using the detection instrument, he/she will determine if landfill gas is present in the monitoring well. Observations will be recorded on the aforementioned "Haywood County Landfill Gas Monitoring, White Oak MSW Landfill" form. If landfill gas is present and the level is detected at or above the lower explosive limit (100% LEL), it must then be determined if the landfill gas is migrating or has migrated beyond that particular monitoring well. If it is determined that explosive landfill gas has or may have migrated beyond the particular monitoring well then additional steps may be implemented to delineate the extent of any suspected landfill gas migration. If it is determined that explosive landfill gas has or may have migrated across the landfill boundary then the facility will immediately take all necessary steps to ensure protection of human health. The North Carolina Department of Environment and Natural Resources (NCDENR) will be notified. Within seven (7) days of detection, the methane gas levels detected and a description of the steps taken to protect human health will be placed in the operating record. Within 60 days of the detection of suspected landfill gas migration at or beyond the landfill boundary, the County will prepare and implement a remediation plan for the suspected landfill gas releases. A copy of the remediation plan will be placed in the operating record and the NCDENR will be notified that the plan has been implemented. Resampling of the affected landfill gas monitoring wells will be performed as necessary to evaluate the effectiveness of the approved remediation plan.

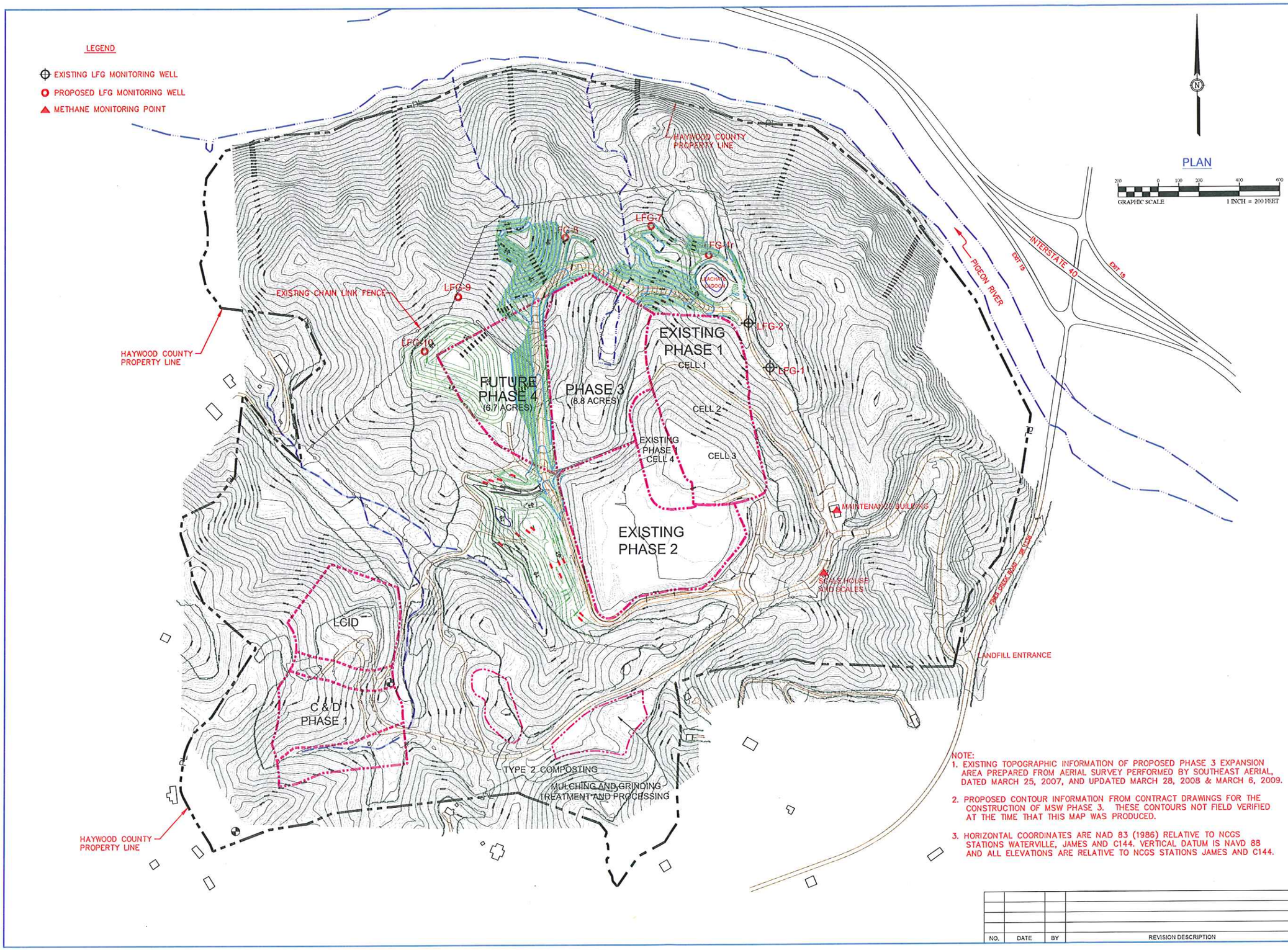
Other quarterly monitoring locations will be the on-site structures located within the landfill's Facility Boundary. Each structure will be monitored for explosive landfill gas using the following general protocol:

1. All crawl spaces, if applicable, will be monitored;
2. All corners in the structure, if accessible, will be monitored;
3. Any observed holes, cracks and/or pipe penetrations through the foundation will be monitored;

Observations will be recorded on the aforementioned "Landfill Gas Measurements Field Worksheet, White Oak MSW Landfill, Haywood County, North Carolina" form. If methane gas is detected above 25% of its lower explosive limit (25% LEL) in any structure, excluding gas control or gas recovery system components, the detection instrument will be recalibrated in accordance with the manufacturer's instructions and the structure resampled. If the reading is still above 25% LEL, evacuate the building and take all steps necessary to protect human health. The North Carolina Department of Environment and Natural Resources (NCDENR) will be notified as well as the Haywood County Solid Waste Director. Within seven (7) days of initial detection, the methane gas levels detected and a description of the steps taken to protect human

health will be placed in the operating record. Upon taking the necessary safety precautions, attempt to determine the source of the explosive gas. If the source is found, initiate repairs to prevent re-infiltration of the landfill gas or remove the source. If the source of the landfill gas infiltration can not be easily determined and/or promptly corrected then the structure must be closed and marked to prevent further occupancy. The County will then prepare and implement a remediation plan for the suspected landfill gas releases within sixty (60) days of initial detection. A copy of the remediation plan will be placed in the operating record and the NCDENR will be notified that the plan has been implemented. The structure will remain closed for occupancy until such time as the repairs and/or remediation plan have been implemented and the structure retested for the presence of landfill gas concentrations. The structure will be reopened for occupancy once the landfill gas concentrations are below the 25% LEL concentration.

Revised July 2010
Revised February 2011



NOTE:
1. EXISTING TOPOGRAPHIC INFORMATION OF PROPOSED PHASE 3 EXPANSION AREA PREPARED FROM AERIAL SURVEY PERFORMED BY SOUTHEAST AERIAL, DATED MARCH 25, 2007, AND UPDATED MARCH 28, 2008 & MARCH 6, 2009.
2. PROPOSED CONTOUR INFORMATION FROM CONTRACT DRAWINGS FOR THE CONSTRUCTION OF MSW PHASE 3. THESE CONTOURS NOT FIELD VERIFIED AT THE TIME THAT THIS MAP WAS PRODUCED.
3. HORIZONTAL COORDINATES ARE NAD 83 (1986) RELATIVE TO NCGS STATIONS WATERVILLE, JAMES AND C144. VERTICAL DATUM IS NAVD 88 AND ALL ELEVATIONS ARE RELATIVE TO NCGS STATIONS JAMES AND C144.

NO.	DATE	BY	REVISION DESCRIPTION

McGill ASSOCIATES
ENGINEERING·PLANNING·FINANCE
55 BROAD STREET ASHEVILLE, NC 28801 PH. (828) 252-0575

FOR REVIEW ONLY

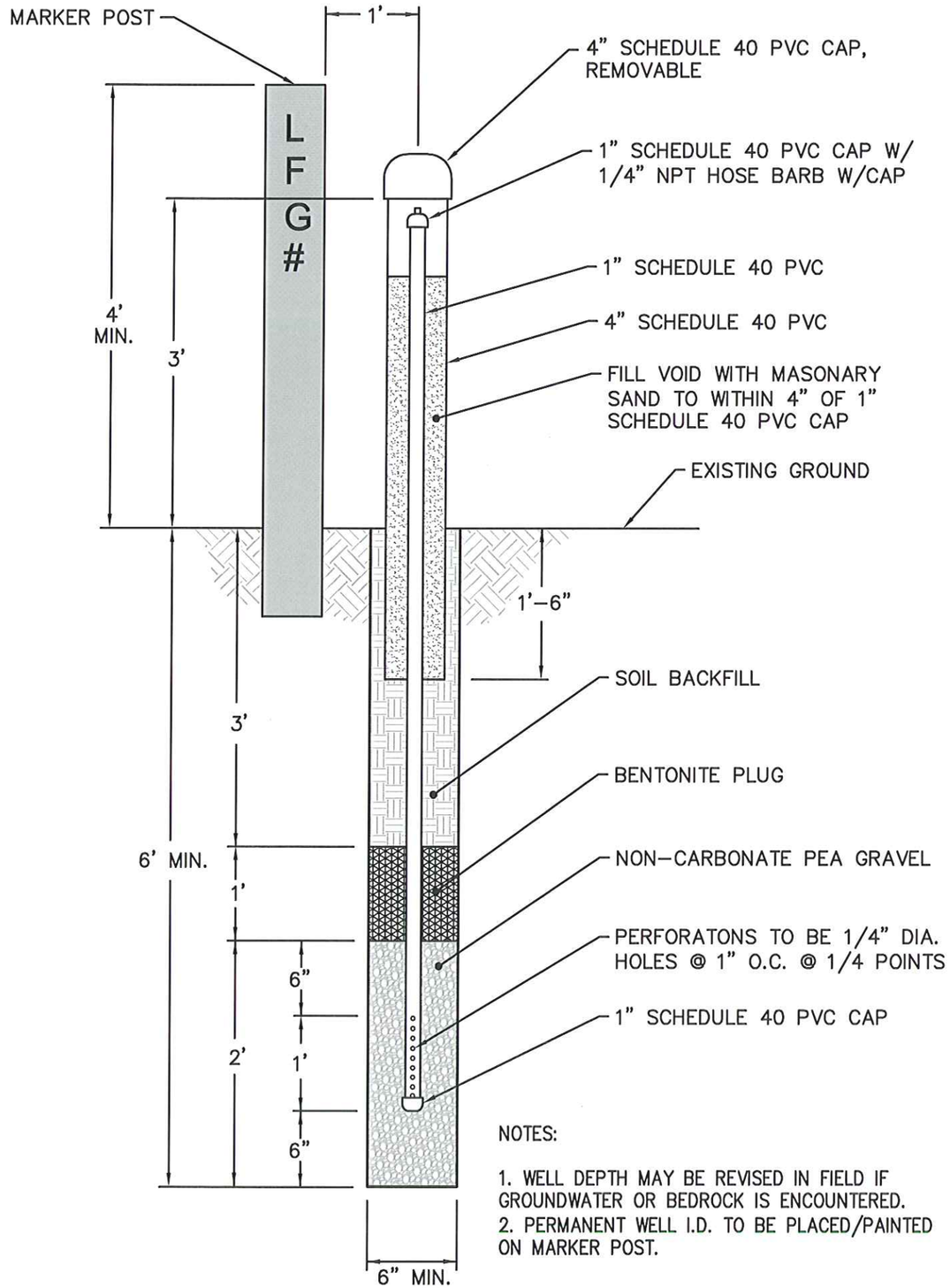
WHITE OAK MSW LANDFILL
HAYWOOD COUNTY
HAYWOOD COUNTY, NORTH CAROLINA

JOB NO.: 07518
DATE: JULY 2010
DESIGNED BY: DP
CADD BY: DP
DESIGN REVIEW: ___
CONST. REVIEW: ___
FILE NAME: WOLF LFG Monitoring Plan.dwg

LANDFILL GAS MONITORING PLAN

FIGURE 1

G:\2007\0718\PERMIT-TO-CONSTRUCT\Post Construction Environmental Monitoring Plan\WOLF LFG Monitoring Plan.dwg 7/12/2010 4:23 PM DAVE PASKO



NOTES:

1. WELL DEPTH MAY BE REVISED IN FIELD IF GROUNDWATER OR BEDROCK IS ENCOUNTERED.
2. PERMANENT WELL I.D. TO BE PLACED/PAINTED ON MARKER POST.

LANDFILL GAS MONITORING WELL

NOT TO SCALE

FIGURE 2

Haywood County Landfill Gas Monitoring
White Oak MSW Landfill

Date:								
Staff:								
Time:								
Date of last calibration:								
Weather Conditions:								
Temperature:								
Barometric Pressure:		Inches Hg:						
		Time:						
				Gas Readings				
		Temp.	CH_4	CO_2	O_2	Balance	LEL	
Well ID		°F	%	%	%	%	%	
LFG 1								
LFG 2								
LFG 4r								
LFG 7								
LFG 8								
LFG 9								
LFG 10								
Maintenance Bldg								
Scale House								
Comments:								

LEGEND

- SW-2 ■ EXISTING SURFACE WATER MONITORING POINT
- MW-17 EXISTING GROUNDWATER MONITORING WELL
- LFG-9 EXISTING LANDFILL GAS MONITORING WELL
- ▲ METHANE MONITORING LOCATION IN STRUCTURE
- GV 9 EXISTING GAS VENT

GROUND WATER MONITORING WELLS AS-BUILT INFORMATION

MONITORING WELL	NORTHING	EASTING	TOP OF CASING ELEVATION	GROUND ELEVATION	[4]SCREENED INTERVAL ELEVATION
[3] MW 1A	721,096.30	812,481.47	2520.02	2517.97	2507.6 - 2492.6
[3] MW 2	721,460.76	812,309.44	2496.71	2494.43	2474.5 - 2459.5
[3] MW 2D	721,456.01	812,311.87	2496.89	2494.69	2450.1 - 2440.1
[1] MW 3r	721,943.38	812,063.70	2462.61	2459.53	2433.2 - 2418.2
[1] MW 3Dr	721,940.67	812,082.82	2461.89	2458.42	2408.6 - 2393.6
[2] MW 4A	721,693.04	811,976.64	2493.85	2491.60	2411.0 - 2396.0
[3] MW 8	721,704.50	812,155.03	2477.33	2474.84	2443.8 - 2433.8
[3] MW 11D	719,909.34	811,651.55	2674.89	2672.01	2554.0 - 2544.4
[3] MW 11S	719,905.88	811,642.89	2674.58	UNKNOWN	UNKNOWN
[3] MW 14	UNKNOWN	UNKNOWN	2711.69[5]	UNKNOWN	UNKNOWN
[3] MW 15	UNKNOWN	UNKNOWN	2547.41[5]	UNKNOWN	UNKNOWN
[1] MW 16	721,821.98	811,660.70	2519.35	2516.07	2490.3 - 2475.3
[1] MW 17	721,783.47	811,219.93	2542.55	2539.13	2496.1 - 2481.1

1 MONITORING WELL INSTALLED DURING THE WEEK OF SEPTEMBER 13 - 17, 2010. AS-BUILT SURVEY PERFORMED BY McGILL ASSOCIATES ON SEPTEMBER 24, 2010.

2 MONITORING WELL LOWERED DURING THE CONSTRUCTION OF MSW PHASE 3. AS-BUILT SURVEY PERFORMED BY McGILL ASSOCIATES ON SEPTEMBER 24, 2010.

3 AS-BUILT INFORMATION PROVIDED FOR PERMIT TO CONSTRUCT MSW PHASE 3, SEPTEMBER 2008.

4 SCREENED INTERVAL AS-BUILT ELEVATIONS PROVIDED BY BLE, INC.

5 HISTORICAL INFORMATION OBTAINED IN DOCUMENTATION PROVIDED BY HAYWOOD COUNTY.

LANDFILL GAS MONITORING WELLS AS-BUILT INFORMATION

LANDFILL GAS WELL	NORTHING	EASTING	TOP OF CASING ELEVATION	GROUND ELEVATION	SCREENED INTERVAL ELEVATION
[3] LFG 1	721,397.45	812,369.57	2497.63	2495.07	UNKNOWN
[2] LFG 2	721,618.88	812,271.02	2480.98	2478.83	UNKNOWN
[1] LFG 4r	721,946.20	812,056.65	2462.44	2459.33	[4]2454.8 - 2453.8
[1] LFG 7	722,087.04	811,784.52	2465.71	2462.35	[4]2457.9 - 2456.9
[1] LFG 8	722,043.59	811,358.63	2526.91	2523.75	[4]2519.3 - 2518.3
[1] LFG 9	721,908.00	810,663.65	2569.28	2566.09	[4]2561.6 - 2560.6
[1] LFG 10	721,504.35	810,573.11	2616.30	2613.12	[4]2608.6 - 2607.6

1 LANDFILL GAS MONITORING WELL INSTALLED DURING THE WEEK OF SEPTEMBER 13 - 17, 2010. AS-BUILT SURVEY PERFORMED BY McGILL ASSOCIATES ON SEPTEMBER 24, 2010.

2 LANDFILL GAS MONITORING WELL INSTALLED DURING MSW PHASE 1 CONSTRUCTION. AS-BUILT SURVEY UPDATED BY McGILL ASSOCIATES ON SEPTEMBER 24, 2010.

3 AS-BUILT INFORMATION PROVIDED FOR PERMIT TO CONSTRUCT MSW PHASE 3, SEPTEMBER 2008.

4 AS-BUILT SCREENED INTERVAL INFORMATION PROVIDED BY BLE, INC.

LANDFILL GAS VENTS AS-BUILT INFORMATION

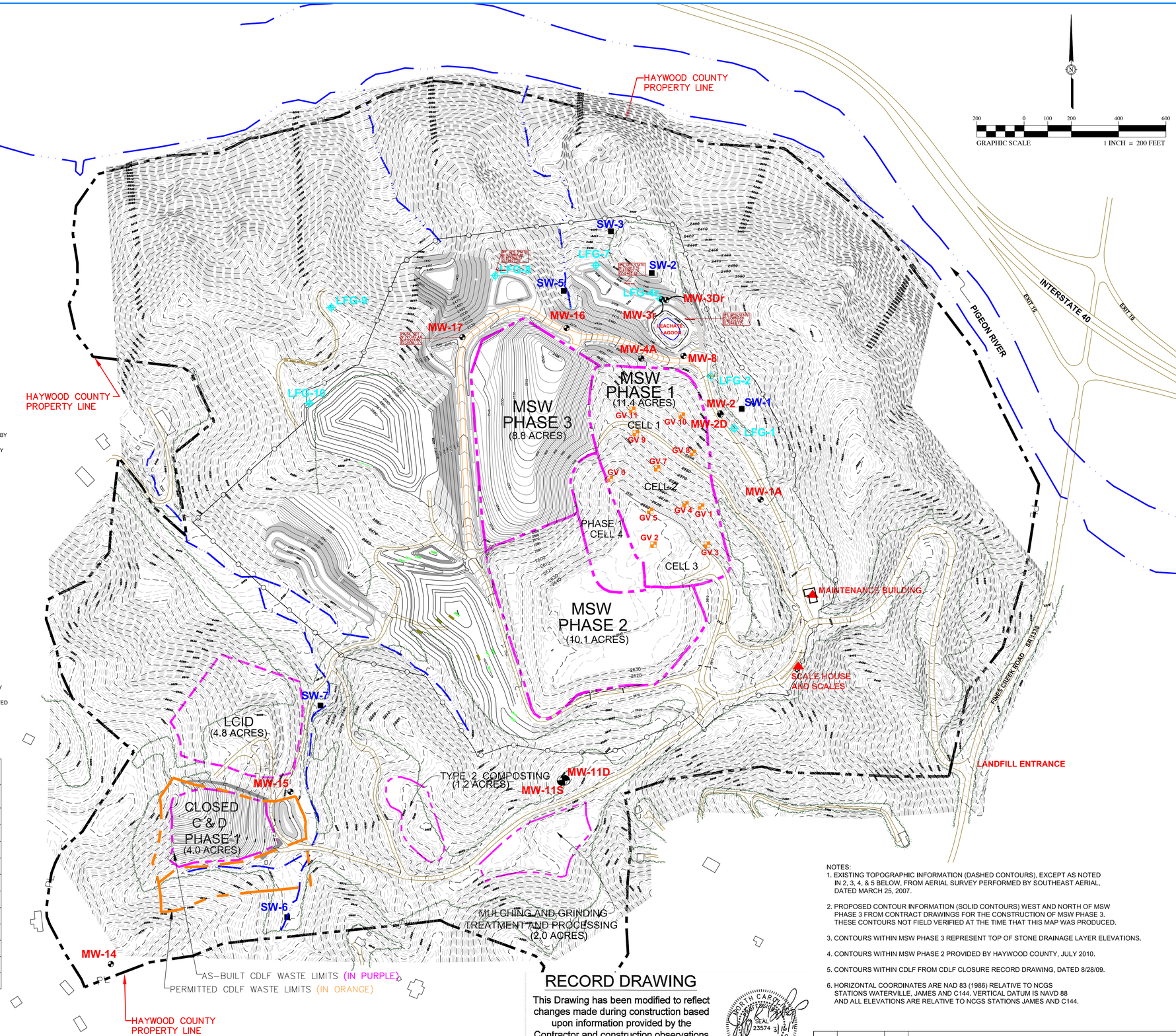
LANDFILL GAS VENT	NORTHING	EASTING	TOP OF CASING ELEVATION	GROUND ELEVATION	VENT BOTTOM ELEVATION
[2] GV 1	721,066.94	812,229.60	2600.98	2593.38	[4]2563
[2] GV 2	720,905.79	812,028.32	2642.72	2627.02	[4]2569
[2] GV 3	720,905.58	812,254.61	2628.75	2613.44	[4]2572
[1] GV 4	721,076.61	812,163.64	2604.78	2600.33	[3]2572.3
[2] GV 5	721,048.81	812,014.17	2638.04	2623.14	[4]2563
[1] GV 6	721,184.32	811,843.91	2621.92	2620.33	[3]2595.3
[1] GV 7	721,228.49	812,043.87	2578.66	2576.84	[3]2546.8
[2] GV 8	721,293.86	812,195.85	2542.79	2530.54	[4]2515
[1] GV 9	721,377.28	811,953.25	2564.17	2562.42	[3]2532.4
[2] GV 10	721,451.74	812,148.22	2523.29	2517.39	[4]2487
[2] GV 11	721,476.41	811,938.39	2555.50	2546.30	[4]2518

1 GAS VENT INSTALLED DURING THE WEEK OF SEPTEMBER 13 - 17, 2010. AS-BUILT SURVEY PERFORMED BY McGILL ASSOCIATES ON SEPTEMBER 24, 2010. VENTS ARE 6" DIA PVC WITH CANDY-CANE TOP.

2 LANDFILL GAS VENT INSTALLED DURING FILLING OPERATION OF MSW PHASES 1 & 2. AS-BUILT INFORMATION PROVIDED BY McGILL ASSOCIATES FOR PERMIT TO CONSTRUCT MSW PHASE 3, SEPTEMBER 2008. VENTS ARE 12" DIA. PVC PIPE WITH OPEN TOPS.

3 VENT BOTTOM ELEVATION PROVIDED BY CONTRACTOR, SEPTEMBER 2010.

4 VENT BOTTOM ELEVATION NOT FIELD VERIFIED. PERMIT DRAWINGS SHOWED ELEVATION AT TOP OF PROTECTIVE LAYER. APPROXIMATE TOP OF PROTECTIVE LAYER ELEVATION NOTED HERE.



NOTES:

1. EXISTING TOPOGRAPHIC INFORMATION (DASHED CONTOURS), EXCEPT AS NOTED IN 2, 3, 4, & 5 BELOW, FROM AERIAL SURVEY PERFORMED BY SOUTHEAST AERIAL, DATED MARCH 25, 2007.
2. PROPOSED CONTOUR INFORMATION (SOLID CONTOURS) WEST AND NORTH OF MSW PHASE 3 FROM CONTRACT DRAWINGS FOR THE CONSTRUCTION OF MSW PHASE 3. THESE CONTOURS NOT FIELD VERIFIED AT THE TIME THAT THIS MAP WAS PRODUCED.
3. CONTOURS WITHIN MSW PHASE 3 REPRESENT TOP OF STONE DRAINAGE LAYER ELEVATIONS.
4. CONTOURS WITHIN MSW PHASE 2 PROVIDED BY HAYWOOD COUNTY, JULY 2010.
5. CONTOURS WITHIN CDLF FROM CDLF CLOSURE RECORD DRAWING, DATED 8/28/09.
6. HORIZONTAL COORDINATES ARE NAD 83 (1986) RELATIVE TO NCGS STATIONS WATERVILLE, JAMES AND C144. VERTICAL DATUM IS NAVD 88 AND ALL ELEVATIONS ARE RELATIVE TO NCGS STATIONS JAMES AND C144.

RECORD DRAWING

This Drawing has been modified to reflect changes made during construction based upon information provided by the Contractor and construction observations made by the Owner's Authorized Representative.

By _____ Date 3/16/11

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23574 JEFFREY R. BISHOP 3/16/11

NO.	DATE	BY	REVISION DESCRIPTION

McGill ASSOCIATES
ENGINEERING·PLANNING·FINANCE
55 BROAD STREET ASHEVILLE, NC 28801 PH (828) 252-0575 FIRM LICENSE # C-0459

WHITE OAK MSW LANDFILL
ENVIRONMENTAL MONITORING PLAN

HAYWOOD COUNTY

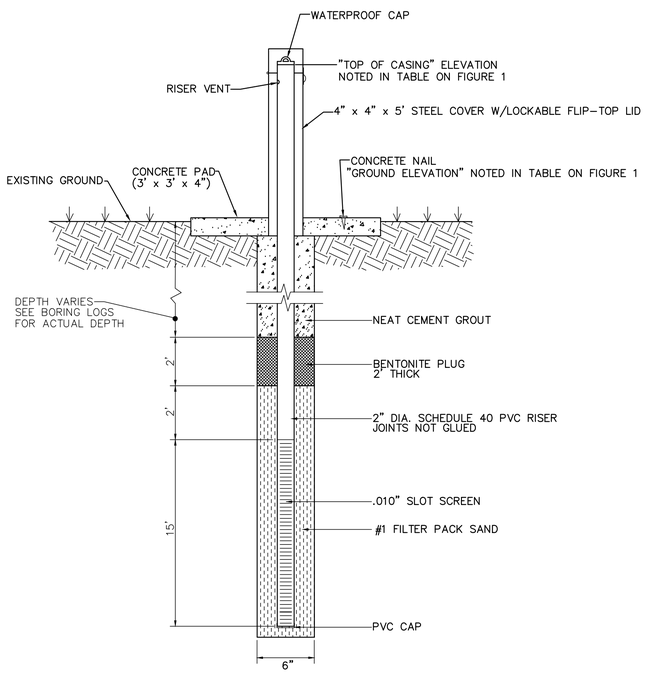
HAYWOOD COUNTY, NORTH CAROLINA

JOB NO.: 07518
DATE: JANUARY 2011
DESIGNED BY: DP
CADD BY: DP
DESIGN REVIEW: ____
CONST. REVIEW: ____
FILE NAME: WOLF Env Monitoring As-Built 2-25-11.dwg

ENVIRONMENTAL MONITORING PLAN
AS-BUILT INFORMATION

FIGURE
1

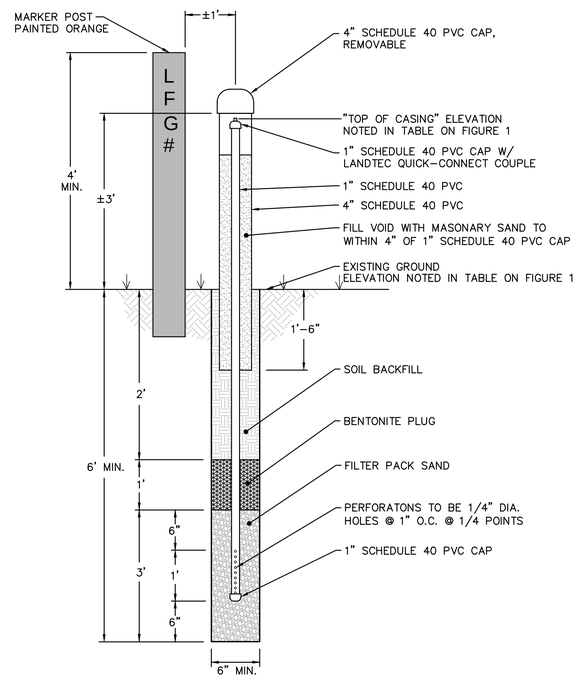
Q:\07518\PERMIT-TO-CONSTRUCT\Post Construction Environmental Monitoring Plan\WOLF Env Monitoring As-Built 2-25-11.dwg 3/16/2011 11:29 AM DAVE



NOTE: THIS INFORMATION PERTAINS ONLY TO MW's 3r, 3Dr, 16 & 17. WELL CONSTRUCTION INFORMATION FOR REMAINING GROUNDWATER MONITORING WELLS IS UNKNOWN.

GROUNDWATER MONITORING WELL CONSTRUCTION DETAIL

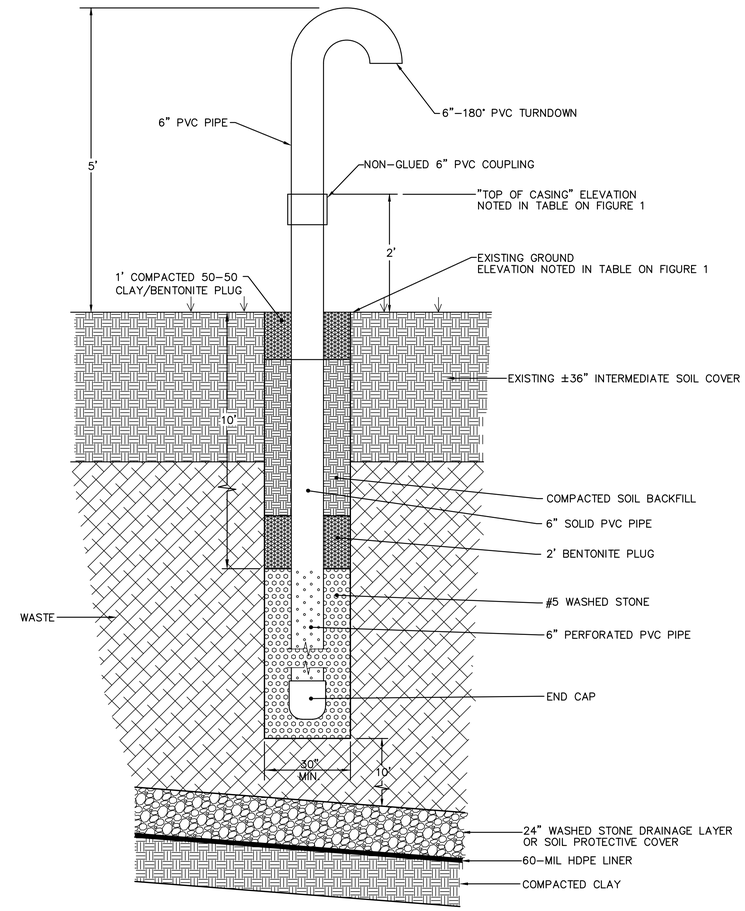
N.T.S.



NOTE: THIS INFORMATION PERTAINS ONLY TO LFG's 4r, 7, 8, 9 & 10. WELL CONSTRUCTION INFORMATION FOR REMAINING LANDFILL GAS MONITORING WELLS IS UNKNOWN.

LANDFILL GAS MONITORING WELL CONSTRUCTION DETAIL

N.T.S.



NOTE: THIS INFORMATION PERTAINS ONLY TO GV's 4, 6, 7 & 9. CONSTRUCTION INFORMATION FOR REMAINING LANDFILL GAS VENTS IS UNKNOWN.

LANDFILL GAS VENT CONSTRUCTION DETAIL

N.T.S.

RECORD DRAWING

This Drawing has been modified to reflect changes made during construction based upon information provided by the Contractor and construction observations made by the Owner's Authorized Representative.

By _____ Date Feb. 25, 2011

NORTH CAROLINA PROFESSIONAL SEAL 23574 ENGINEER JEFFREY R. BISHOP

NO.	DATE	BY	REVISION DESCRIPTION

McGill ASSOCIATES
ENGINEERING·PLANNING·FINANCE
55 BROAD STREET ASHEVILLE, NC 28801 PH.(828) 252-0575 FIRM LICENSE # C-0459

WHITE OAK MSW LANDFILL
ENVIRONMENTAL MONITORING PLAN

HAYWOOD COUNTY

HAYWOOD COUNTY, NORTH CAROLINA

JOB NO.: 07518
DATE: JANUARY 2011
DESIGNED BY: DP
CADD BY: DP
DESIGN REVIEW: ____
CONST. REVIEW: ____
FILE NAME: WOLF Env Monitoring As-Built 10-22-10.dwg

ENVIRONMENTAL MONITORING PLAN WELL CONSTRUCTION DETAILS

FIGURE 2

Q:\2007\07518\PERMIT-TO-CONSTRUCT\Post Construction Environmental Monitoring Plan\WOLF Env Monitoring As-Built 10-22-10.dwg 2/25/2011 3:56 PM DAVE