



January 30, 2014

Mr. Brian Wootton
North Carolina DENR
Solid Waste Section
Division of Waste Management
1646 Mail Service Center
Raleigh, North Carolina 27699-1646

RE: Proposed Landfill Gas Monitoring Plan
North Mecklenburg C&D Closed Landfill
15300 Holbrooks Road
Huntersville, North Carolina

Dear Mr. Wootton:

Per your letter to Mr. Mike Griffin with Greenway Waste Solutions, LLC dated November 22, 2013, please find the attached Proposed Landfill Gas Monitoring Plan for the subject closed facility.

Please contact me at (803) 547-4955 if you have any questions or comments concerning this Plan.

Sincerely,
ENVIRO-PRO, P.C.

A handwritten signature in cursive script that reads "Thomas H. Bolyard".

Thomas H. Bolyard, P.G.
Senior Hydrogeologist

cc: Mr. Mike Griffin, Greenway Waste Solutions, LLC.
Ms. Jaclynne Drummond, Compliance Hydrogeologist



PROPOSED LANDFILL GAS MONITORING PLAN

**North Mecklenburg C&D Landfill
Closed Phase I and Phase II Areas
Solid Waste Permit No. 60-13
Huntersville, Mecklenburg County, North Carolina**

Prepared for:

**Greenway Waste Solutions, LLC
19109 West Catawba Avenue – Suite 200
Cornelius, North Carolina 28031**

Prepared by:

**Enviro-Pro, P.C.
2646 Farmlake Lane
Fort Mill, South Carolina 29708**

Project No. EP-1217 (A)

January 29, 2014

Background

A landfill gas monitoring plan was not submitted upon closure of the older closed Phase I and Phase II portions of this landfill facility. This Proposed Landfill Gas Monitoring Plan is being submitted in response to the North Carolina Solid Waste Section's letter dated November 22, 2013.

The depth of proposed gas monitoring wells is controlled by the relatively shallow groundwater table across the northern, northwestern, and northeastern portions of the landfill perimeter. Generally shallow bedrock depths dictate the gas well depths in the eastern, southern, and western areas of this site.

This closed landfill facility is subject to rule 15A NCAC 1313.0503 (2) (a) which states that the concentration of explosive gasses generated by the site shall not exceed: 1) 25% of the limit for the gases in site structures; and 2) The lower explosive limit for the gases at the property boundary. The proposed Landfill Gas Monitoring Plan presented herein was prepared in accordance with the North Carolina Solid Waste Section's "Landfill Gas Monitoring Guidance" dated November 2010.

Landfill Gas Monitoring

A gas control plan will be implemented to detect possible migration of methane and hydrogen sulfide gases off-site from this closed landfill facility. A total of 10 proposed gas monitoring wells will be installed around the perimeter of the area of former waste disposal. No wells are being proposed along the northern perimeter along the tributary of Cane Creek since it is contiguous with the NMLF-Infill permitted facility which already has existing gas wells located along the Creek. The approximate locations of these monitoring wells are indicated on the attached Figure 1.

The proposed gas well locations were selected to maintain an average spacing of approximately 400 feet around the perimeter of the site, and to utilize cleared access for previously installed groundwater monitor wells where possible. Table 1 summarizes the proposed gas well construction information. The wells will be installed to a termination depth above the water table or to the top of bedrock and will be screened across the majority of the partially weathered rock (PWR) and saprolitic zones to within approximately 5 feet of the ground surface.

If possible, boreholes for the proposed gas monitoring wells will be constructed using a direct push Geoprobe rig. Two-inch diameter Schedule 40 PVC pipe with 0.01-inch slots will be inserted into each probe boring. PVC riser pipe will be threaded into the top of the screen section to bring the pipe approximately 2 to 3 feet above ground level. The annular space will be backfilled with No.2 washed, medium sand to a depth of 2 feet above the top of the well screen. A minimum 2-foot bentonite seal will be constructed on top of the sand filter pack, with bentonite used to seal the annular space to within 2 feet of the ground surface. A cement cap will be installed on top of the bentonite to the ground surface. A non venting PVC pipe cap will be attached to the top of each 2-inch PVC riser pipe stick-up. A gate valve will be installed on the riser pipe to allow for gas sampling. A hinged, lockable metal protective cover will be installed over the PVC riser pipe. The proposed landfill gas monitoring well construction detail is shown on Figure 2.

Once the proposed gas monitoring wells have been installed, their locations will be surveyed and indicated on a Site Map similar to Figure 1.

There are no existing structures on the closed landfill area, so the only sampling will be conducted in the perimeter gas monitoring wells. Methane and hydrogen sulfide gas monitoring will be conducted on a quarterly basis by EP personnel.

Landfill Gas Sampling Procedures

Gas monitoring will be conducted by EP personnel trained to use a GEM-2000 or equivalent meter. Monitoring will be performed in each of the proposed gas monitoring wells. Testing procedures for the monitoring wells will be as follows:

- 1). Calibrate the GEM-2000 meter in accordance with the manufacturer's recommendations for methane or explosive gas calibration.
- 2). Attach the gas analyzer probe tubing to the monitoring probe gate valve on the well riser pipe.
- 3). Open the gate valve.
- 4). Read the percent methane and hydrogen sulfide gases, and percent LEL (lower explosive limit).
- 5). Record the stabilized reading of methane and hydrogen sulfide gases measured.

- 6). Turn the gate valve to the off position and disconnect the tubing.
- 7). Proceed to the next landfill gas monitoring well and repeat steps 2-6.

Record Keeping and Reporting

The methane and hydrogen sulfide gas monitoring will be conducted by EP personnel on a quarterly basis. The results of these measurements will be recorded for each gas monitoring well on a field data sheet (Table 2) and placed in the operating record for the landfill facility. Sampling reports will be prepared by EP for each quarterly sampling event and will be kept at the landfill office as a permanent record.

Contingency Plan

Regulations require that the concentration of explosive gases generated by this closed landfill facility shall not exceed the lower explosive limit (LEL) for methane and hydrogen sulfide at the landfill property boundaries. Should either of the explosive gas levels be detected above these limits, EP will inform landfill personnel who will immediately take the necessary steps to protect human health and notify the North Carolina Solid Waste Section.

The steps that would be taken include but are not limited to:

- Restrict access to any facility structures or exterior areas displaying high methane or other explosive gas levels;
- Prohibit the use of any equipment or materials that may cause sparks or an open flame;
- Report methane or other explosive gas levels to the Operations Manager, and
- Turn off the electrical main switch outside of any structure exhibiting high methane or other explosive gas levels.

Within 7 days of detecting methane or hydrogen sulfide gas levels exceeding the LEL at the facility property boundaries, the gas levels will be placed in the operating record along with a description of the steps taken to protect human health. Within 30 days of detecting gas levels exceeding the LEL, a Gas Remediation Plan will be submitted to the

North Carolina Solid Waste Section for their review and approval. This Plan will describe the methods to be utilized to locate the source of the methane or other explosive gas, and cap or isolate it.

This Plan may also include the installation of additional monitoring wells to further determine the extent of the gas, additional gas sampling, and the installation of gas extraction wells. Once approved, the Plan will be implemented within 30 days.

Professional Certification

This Landfill Gas Monitoring Plan for the closed Phase I and II areas of the North Mecklenburg Landfill facility has been prepared by a qualified geologist who is licensed to practice in the State of North Carolina. The Plan has been prepared based on first-hand knowledge of site conditions and familiarity with the North Carolina solid waste rules and industry standard protocol. This certification is made in accordance with North Carolina Solid Waste Regulations, indicating this Landfill Gas Monitoring Plan should provide early detection of any release of hazardous constituents to the uppermost aquifer, so as to be protective of public health and the environment. No other warranties, expressed or implied, are made.

Signed Thomas H. Bolyard
Printed Thomas H. Bolyard
Date 1-29-14

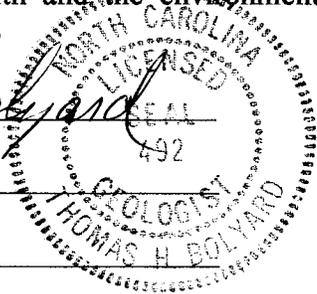


TABLE 1

SUMMARY OF PROPOSED GAS MONITORING WELL CONSTRUCTION

Well ID	Total Depth	Screen Interval	Depth to Groundwater	Depth to Bedrock
GW-1	11	5-11	14	18
GW-2	13	5-13	16	20
GW-3	25	5-25	57	25
GW-4	24	5-24	40	24
GW-5	23	5-23	33	23
GW-6	30	5-30	36	30
GW-7	36	5-36	40	36
GW-8	20	5-20	65	20
GW-9	15	5-15	18	20
GW-10	15	5-15	18	20

Notes:

Gas Well Locations are Shown on FIGURE 1.

All Depths are in Feet Below Ground Surface.

All Wells will be Constructed of 2-inch schedule 40 PVC

TABLE 2
LANDFILL GAS MONITORING FIELD DATA

Well Number: _____

Project Name: _____

Location: _____

Project Number: _____

Date: _____

Personnel: _____

Time: _____

Ambient
Temperature: _____

Barometric
Pressure: _____

Weather
Conditions: _____

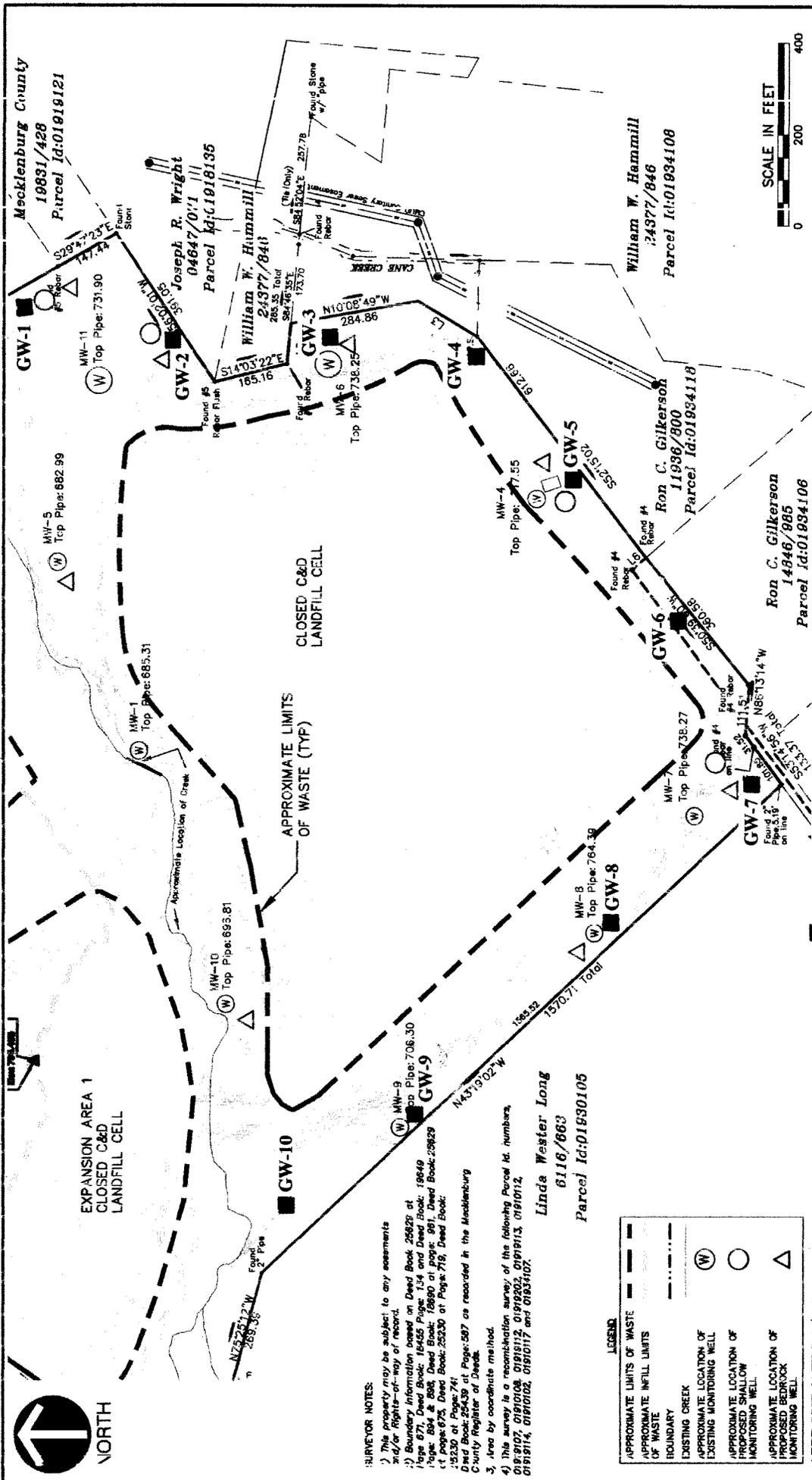
Soil Moisture
Conditions: _____

Condition
of Well: _____

Methane
Reading: % Methane: _____ % LEL: _____

Hydrogen Sulfide:

Oxygen:



Mecklenburg County
19831/428
Parcel Id:01919121

Joseph R. Wright
04647/011 III
Parcel Id:01918135

William W. Hammill
24377/840
Parcel Id:01934108

William W. Hammill
34977/846
Parcel Id:01934108

Ron C. Gilkerson
11986/800
Parcel Id:01934118

Ron C. Gilkerson
14846/885
Parcel Id:01934106

Linda Wester Long
6116/663
Parcel Id:01930105

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2030 S. Tryon Street - Suite 3E - Charlotte, NC 28203
Ph: 680.224.8104 - Fax: 680.224.8172
www.cecnc.com

GREENWAY WASTE SOLUTIONS OF NORTH MECK, LLC.
NORTH MECK/LENBURG LANDFILL
HUNTERSVILLE, NC
PHASE 1
MONITORING WELL LOCATION MAP

SCALE IN FEET
0 200 400

DRAWN BY: TMG
CHECKED BY: SLB
APPROVE BY: TMG
PROJECT NO. 111-3701.001
FIGURE NO. 1
DATE: AUG. 2013
DWG SCALE: 1"=200'

SURVEYOR NOTES:

1. This property may be subject to any easements or other rights-in-way of record.
2. Boundary information taken from Dead Book 28829 at Page 1, 804 & 808; Dead Book 18840 at Page 98; Dead Book 875; Dead Book 25330 at Page 719; Dead Book 5230 at Page 741; Dead Book 25439 at Page 597 as recorded in the Mecklenburg County Register of Deeds.
3. Area by coordinate method.
4. This survey is a reconnaissance survey of the following Parcel Id. numbers, 01919121, 01918135, 01919113, 01910712, 01919114, 01910182, 01910117 and 01934108.

LEGEND

--- (dashed line)	APPROXIMATE LIMITS OF WASTE
--- (long dashed line)	APPROXIMATE INFILL LIMITS OF WASTE
---	BOUNDARY
---	EXISTING CREEK
○ (circle with W)	APPROXIMATE LOCATION OF EXISTING MONITORING WELL
○ (circle)	APPROXIMATE LOCATION OF PROPOSED SHALLOW MONITORING WELL
△ (triangle)	APPROXIMATE LOCATION OF PROPOSED BEDROCK MONITORING WELL

REFERENCE

1. 2013 TOPOGRAPHIC INFORMATION PROVIDED BY PATTERSON LAND SURVEYING, PA. DATE OF AERIAL PHOTOGRAPHY JUNE 1, 2013
2. EXISTING TOPOGRAPHIC CONTOUR INFORMATION PROVIDED BY INDEPENDENT MAPPING CONSULTANTS - FEBRUARY 7, 2008
3. EXISTING AND PROPOSED WELL LOCATIONS PROVIDED BY PATTERSON LAND SURVEYING AND TOM BOLLARD, P.G. FROM ENVIRO-PRO, P.C.

Map Modified by Enviro-Pro, PC on Jan 21, 2014

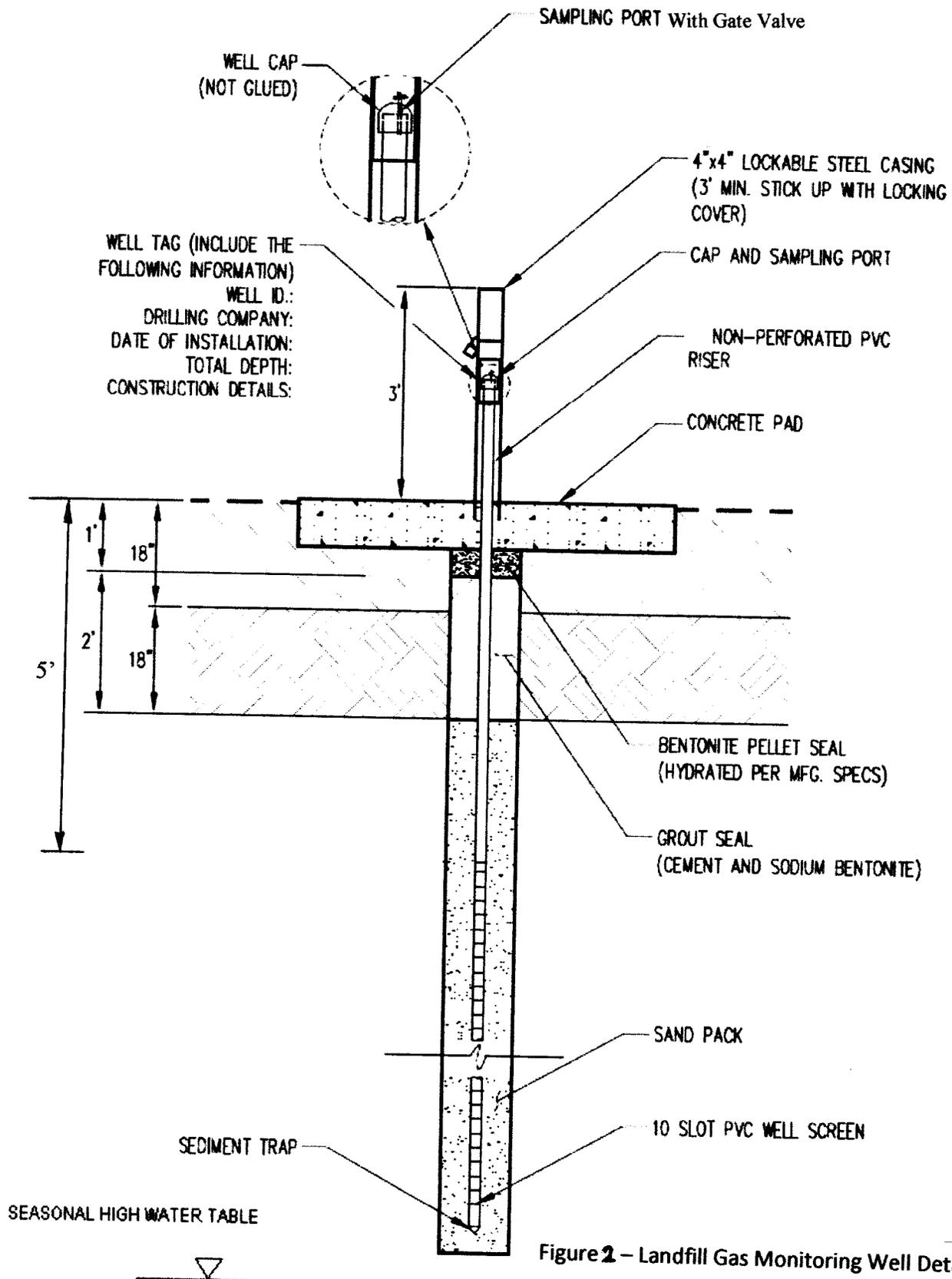


Figure 2 - Landfill Gas Monitoring Well Detail

DRAWN BY:
CK BY:
PROJ MGR: THB
DATE: 1-9-14



SCALE: NTS
PROJ NO: EP-1217(A)
FILE NAME:
LAYER: