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August 5, 2011
File No. 07207006.10

Mr. Steve Richtel, R.G.
Area Director, Closed Sites
Waste Management of Washington
2400 West Union Avenue
Englewood, CO 80110-5354

Subject: Work Plan for 2011 GCCS Expansion for implementing Ecology's Corrective Action Plan at the Olympic View Landfill, Port Orchard, Washington

Dear Mr. Richtel:

The following work plan is for implementing the Washington State Department of Ecology's (Ecology's) Cleanup Action Plan at the Olympic View Sanitary Landfill (OVSL) located in Port Orchard, Washington.

The Ecology Cleanup Action Plan, dated December 2010, prescribes the installation of additional landfill gas extraction wells as one of the six components for site remedy. This work plan only address this component of the site remedy. The addition of landfill gas extraction wells is prescribed in the area of the landfill where no bottom liner system exists (Old Barney White Landfill area or OBWL). The goal of installing these additional wells is to enhance the capture of landfill gas in this area that may be contributing to groundwater contamination.

The following work plan is intended to meet the requirements described in Section 6.2 of the Cleanup Action Plan. Specifically, this work plan discusses the following:

1. How the number and locations of wells were determined
2. Gas well design/construction
3. Construction quality assurance
4. Gas well operations
5. Method(s) used to evaluate performance of gas extraction wells, and decision making process for additional wells if necessary

1 DETERMINATION OF NUMBER AND LOCATION OF GAS EXTRACTION WELLS

The number of proposed gas extraction wells, locations, and depths are shown on Figures 1, 2 and 3. The proposed gas extraction wells are identified as GW-107 through GW-112. The objective of these proposed gas extraction wells is to provide additional gas collection from the refuse mass, reduce/minimize gas intrusion into the vadose zone, and recover landfill gas from the vadose zone. These proposed gas extraction wells are located and designed to focus on gas

extraction in the deeper zones of waste near the bottom of the landfill. The number and locations have been selected based on review of the following information:

- Vacuum influence of existing gas wells.
- Historical gas well monitoring results
- Historical gas probe monitoring results
- Spatial relationship between existing gas wells and groundwater wells
- Thickness of the vadose zone

Vacuum influence of existing gas wells

The effectiveness on each of the existing gas wells in the OBWL area was examined by measuring the influence of vacuum each well had on the adjacent gas wells when operated independently with the remainder of the OBWL gas wells shut off. SCS conducted a vacuum influence test on each of the existing gas wells by shutting off all wells in the OBWL area, then activating one well and measuring the vacuum at the adjacent wells. This process was repeated for each well in the OBWL area.

The procedure for the field test is described below:

1. Shut off all wells to the OBWL area (GW-1 through 16) and gas wells in the Phase 1 & 2 areas immediately adjacent to the OBWL area (GW-38, 77, 78, 28, 95, & 96).
2. Wait 1 hour.
3. Conduct testing on one well (GW-5) to establish response time using the following procedure.
   a. Open valve to wide open position.
   b. Record vacuum on this gas well and the immediately adjacent gas wells and gas probes.
   c. Repeat vacuum measurements at 15-minute intervals for 1 hour.
   d. Measure and record the pressure at the gas wells and gas probes.
4. Conduct testing on all wells (GW-1 through GW-14) in the following sequence:
   a. First test GW-1, 2, 3 & 14
   b. Next, open gas wells GW-38, 77, 78, 28, 95, & 96 and reset to original vacuum and flow conditions prior to testing.
   c. Continue tests with remaining wells.
5. Conduct testing on individual wells using the following procedure:
   a. Select a single gas well for testing.
   b. Open the valve to the wide open position and wait for measuring vacuum (according to the response time determined in step 3 above).

c. Record the maximum vacuum on the gas well and the immediately adjacent gas wells and gas probes.

d. Adjust the valve to 2/3 maximum vacuum and wait for measuring vacuum (according to the response time determined in step 3 above).

e. Record the vacuum on the gas well and the immediately adjacent gas wells and gas probes.

f. Adjust the valve to 1/3 maximum vacuum and wait for measuring vacuum (according to the response time determined in step 3 above).

g. Record the vacuum on the gas well and the immediately adjacent gas wells and gas probes.

h. Close the valve on this well.

6. Repeat step 5 for the remainder of the gas wells in the OBWL area (GW-1 through 14, including the well used for testing response time).

7. Document the pressures measured at the gas wells and gas probes in a tabular format (see Attachment A).

8. Open all gas wells and reset them to the original vacuum and flow conditions prior to the testing.

The results of the field testing are presented in Attachment A. The results indicate that the majority of gas wells had some vacuum influence on adjacent wells. Gas wells GW-2 and GW-3 are located within the liner system of Phase 1 area so it is expected that vacuum influence could be limited to wells within the lined portion of Phase 1. The results further indicate that the gas wells GW-5, 6, 8, & 9 (surrounding well GW-7) do not appear to have an influence on GW-7. Based on these results, it appears that additional gas extraction wells installed between GW-5 and GW-7 as well as between GW-8 and GW-7 would enhance vacuum and gas extraction in this area. Also, the results demonstrate limited effectiveness for gas wells GW-10, 11, 12 and 13. Based on these results, it appears that an additional gas extraction well between GW-8 and GW-10 would enhance vacuum and gas extraction in this area.

Historical Gas Well Monitoring Results

The historical gas extraction well monitoring results are presented in Attachment B. Based on the review of these data, it appears there has been a more consistent gas extraction from wells in the OBWL area in the past year. This is evident from more stabilized gas composition, flow, and vacuum as shown on the graphs in Attachment B.

It should be noted that there has been a concerted effort to maximize gas extraction from the OBWL area wells in the past year. A new blower flare station has been installed with a variable frequency drive motor for the blower with controls for vacuum set point. This allows a uniform vacuum to be applied and maintained consistently to the well field relative to fluctuations in barometric pressure. This also prevents barometric pressure swings from affecting individual well vacuum. The enhanced and consistent well vacuum results in better well performance as

indicated in the recent monitoring documentation. Also, an increase in vacuum has been applied to these gas wells, which initially resulted in "overpulling" of the gas extraction wells. The extraction rates from these wells were gradually adjusted to optimum conditions to prevent excessive overpulling while maintaining suitable gas composition for operating the flare. Additionally, in June 2011 the cover penetration seals around the existing gas wells in the OBWL area were replaced and modified to minimize air intrusion. This allows for greater vacuum to be applied to these gas extraction wells. Recent groundwater monitoring results indicate that the upgrades to the blower and the well penetration seals may have contributed to reductions in vinyl chloride concentrations.

Historical Gas Probe Monitoring Results

SCS reviewed the historical gas probe monitoring results as shown in Attachment C. Based on the review of these data, it appears the gas probes contain very little landfill gas as represented by combined methane and carbon dioxide as well as elevated oxygen content. Note that methane was not detected in any of the gas probes. This suggests that in the areas of the gas probes, there is very little landfill gas in the vadose zone. It also suggests that the existing gas extraction wells in the OBWL area are successful in minimizing migration of landfill gas outside the limits of refuse in the OBWL area.

Spatial relationship between existing gas wells and groundwater wells

The proposed gas wells GW-107, 108, and 112 are positioned between existing gas wells due to the larger distance between existing gas wells GW-1, 5, and 7 as well as gas wells GW-4, 6, and 13. Gas wells GW-107 through GW-111 are positioned along the perimeter to aid in recovering gas in the vadose zone along the perimeter of the landfill between the edge of refuse and existing groundwater wells impacted by vinyl chloride.

Depth of vadose zone

Review of well depths and vadose zone data indicate that installation of deeper gas extraction wells would aid in removal of gas from the vadose zone. SCS reviewed the depths of the existing wells, estimated bottom of refuse contour map (prepared by another consultant), and seasonal groundwater contour maps. This review allowed for an estimation of the thickness of vadose zone at the locations of existing wells. Maps of seasonal low and high groundwater elevations were superimposed on the estimated bottom of refuse contour map as shown in Attachment D. Cross sections through the landfill illustrating these relationships are also presented on Figures 2 and 3. These drawings also provide the bottom elevation of existing wells and estimated thickness of the vadose zone at each existing well for seasonal low and seasonal high groundwater. Based on this information, there appears to be a significant vadose zone thickness below the OBWL area ranging between 30 and 80 feet. Note that in this case, the vadose zone may be native soils and or a combination of native soil and refuse.

2 GAS WELL DESIGN/CONSTRUCTION

The design for the additional gas extraction wells planned for the OBWL are shown on Attachment E. Drawing C2 presents the gas extraction well locations, Drawing C4 shows the proposed gas extraction well depths, and Drawing C5 provides the details of the gas extraction wells.

The gas extraction wells will be constructed over the existing cover system which includes geosynthetic components. Precautions will be taken to ensure that the geosynthetics are not damaged during installation of the gas wells and conveyance piping. Drill pads will need to be constructed on the sideslope to allow for leveling of drilling equipment. The gas wells will be drilled to the bottom of refuse to confirm that an adequate depth is achieved. This is necessary because the bottom of refuse is not known in the OBWL area. The drilling may progress up to 10 feet below what appears to be the refuse/native soil interface to verify the location of the bottom of refuse. The excess depth will be backfilled as necessary.

3 CQA OF THE GAS EXTRACTION WELLS

CQA of the gas wells and conveyance pipe construction will consist of field inspection, documentation, and reporting. Variances from the project drawings, specifications, and best management practices (BMPs) will be noted and brought to the attention of Waste Management, Inc. and the Contractor for corrective action, if necessary.

CQA for the gas well construction process will consist of the following activities:

- During drilling operations, the CQA Monitor will observe the advancement of the borings and will document at 20-foot intervals the waste characteristics, temperature, and depth.
- The CQA Monitor will document significant changes in waste characteristics, soil lenses, presence of perched water or zones of saturation encountered during drilling and document the final boring depth.
- The CQA Monitor will also observe the proper collection and disposal of the boring-derived waste.
- During well construction/completion, the CQA Monitor will observe and document materials used, total length of pipe, length of perforated pipe and solid pipe, thickness of filter pack, location and thickness of seals, number of bentonite bags per seal, depth of backfill, location of centralizers, and location of settlement joints.

CQA of the conveyance pipe construction process will consist of the following activities performed by the CQA Monitor:

- Periodically observe pipe welding and pipe installation to verify it complies with the project specifications.
- Periodically observe connections to existing pipe and installation of wells heads.
- Photograph pipe as installed prior to backfilling.
- Coordinate with surveyor and contractor to verify that the pipe is surveyed at 20 feet intervals and also at each pipe joint as well as each elbow, and tee.

CQA for the cover system repair process will consist of the following activities performed by the CQA Monitor:

- Observe and document the repairs to the landfill cover system made by the Contractor.
- Observe and document the repairs to the geosynthetic portion of the landfill cover system in accordance with the membrane manufacturer's specifications and/or recommendations, including the seam preparation, method of welding (noting the temperature of the instrument, speed at which the weld is produced, and condition of the weld upon completion), length of weld, and testing of the weld.
- Observe and document that the cover soils are placed, compacted, and seeded in accordance with the project specifications.
- Observe and document the necessary temporary erosion and sediment controls provided/installed/constructed by the Contractor and will compare the methods employed to the best management practice requirements of the Stormwater Management Manual for Western Washington (current edition).

The CQA Monitor will prepare a project summary to document aspects of the CQA program presented above. The document will include:

- Boring and well completion logs.
- Geomembrane repair logs.
- Soil cover repair logs.
- Shop drawings.
- Submittals.
- Field inspection reports.
- Quality control/assurance documentation.
- Record drawings reflecting as-built conditions.

4 GAS WELL OPERATIONS

The proposed landfill gas extraction wells will be operated to maximize extraction to the extent possible while maintaining anaerobic condition within the refuse mass. Gas well vacuum will be monitored along with gas composition, gas flow, well temperature and system vacuum. The data will be recorded for periodic review and analysis of well performance. The vacuum and flow for each well will be adjusted up or down depending on gas composition, well temperature, and available fuel for the landfill gas flare.

5 EVALUATING PERFORMANCE OF GAS WELLS

The performance of the proposed landfill gas extraction wells will be evaluated based on review of individual gas well operating data, gas probe data, and groundwater data. The proposed gas extraction wells will be operated, maintained, and monitored consistent with the existing procedures. Monitoring data from the proposed gas extraction well operations will be recorded consistent with the existing procedures. The results of gas well monitoring will be periodically reviewed and analyzed for gas well performance. If necessary, adjustments in extraction rates

will be made to optimize gas extraction. If after no significant gains in groundwater quality are realized, then modifications to the well field will be evaluated, including the need for additional wells.

6 SCHEDULE

The schedule presented below is proposed for the completion of the work described above within the time limits described below, assuming timely review and approval of this Work Plan.

Description	Duration	Completion
Work Plan Submittal	--	Aug 8, 2011
Work Plan Review and Approval	30 days	Sep 7, 2011
Procurement (Concurrent with Plan Review)	--	Sep 7, 2011
Final Design	4 weeks	Sep 27, 2011
Construction and CQA	2 weeks	Oct 14, 2011
CQA Summary Report and Record Drawings	2 weeks	Oct 28, 2011

Very truly yours,

Ted Massart
Project Engineer
SCS Engineers

John Richards
Project Director
SCS Engineers

cc: Charles Luckie - WMI
Dave Wilson - WMI
Tony Svorinich - SCS Field Services
Steve Harquail – SCS Field Services

Attachments:
Figures
A Existing Gas Well Vacuum Influence Test
B Historical Gas Well Monitoring Results
C Historical Gas Probe Monitoring Results
D Vadose Zone Thickness Maps
E Drawings

Figures

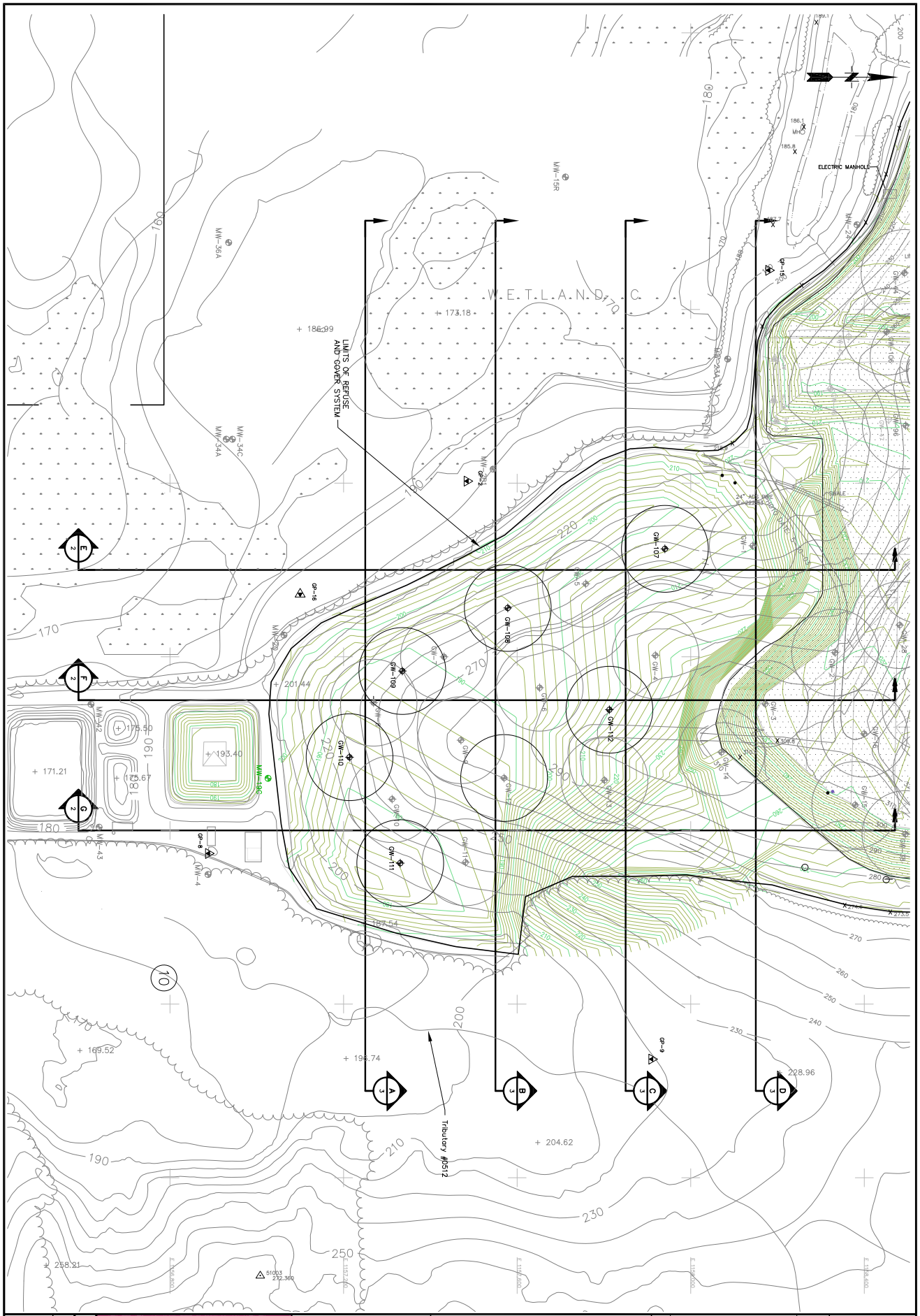
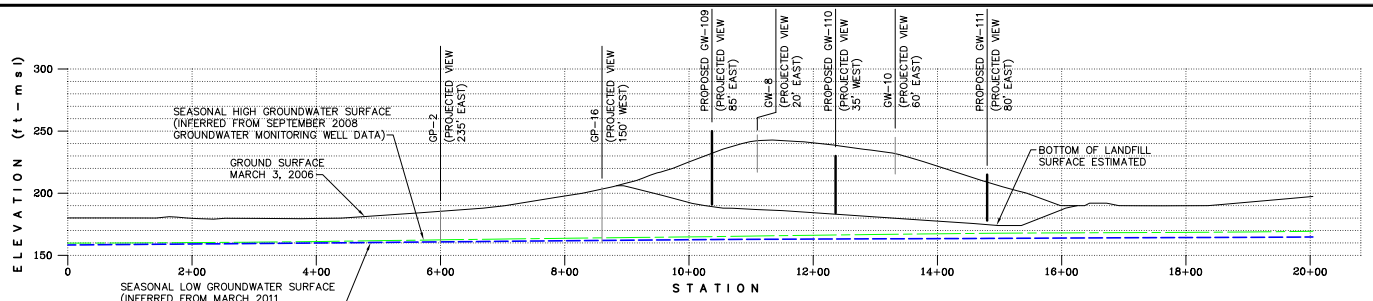


FIGURE NO. 1	SCALE: 1" = 100'-0" (22x34 SHEET)	DATE: JULY 2011	SCS ENGINEERS Environmental Consultants and Contractors 2405 140th Avenue NE, Suite 107 Bellevue, Washington 98005 (425) 746-4600 FAX: (425) 746-6747	OLYMPIC VIEW SANITARY LANDFILL, INC.	SHEET TITLE: GAS EXTRACTION NETWORK OLD BARNEY WHITE LANDFILL (OBWL) AREA PROJECT TITLE: 2011 GAS SYSTEM EXPANSION LANDFILL GAS COLLECTION & CONTROL SYSTEM (GCCS) OLYMPIC VIEW SANITARY LANDFILL

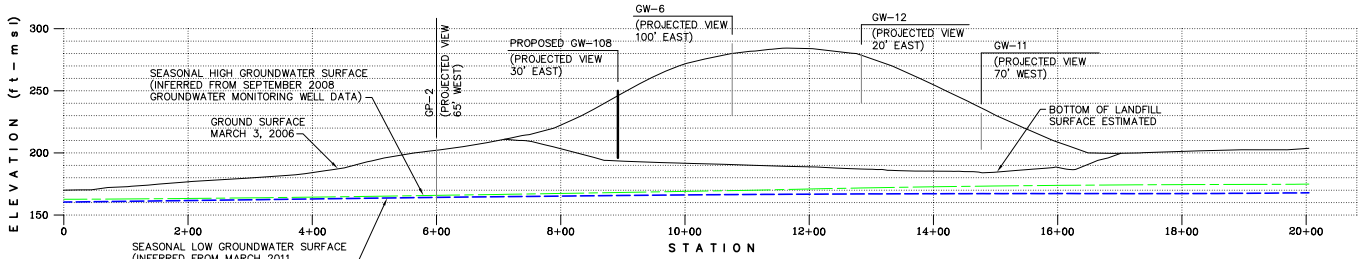
PROJ. NO.	DWN. BY:	ACAD FILE:
07207006.10	LEL	1
DSN. BY: TAM	CHK. BY: EMS	APP. BY: JMR

NO.	REVISION	DATE
A	ISSUED FOR CLIENT REVIEW	7/27/11
B	ISSUED FOR CLIENT REVIEW	8/3/11



NORTH–SOUTH SECTION A

SCALE: 1" = 100'



NORTH–SOUTH SECTION B

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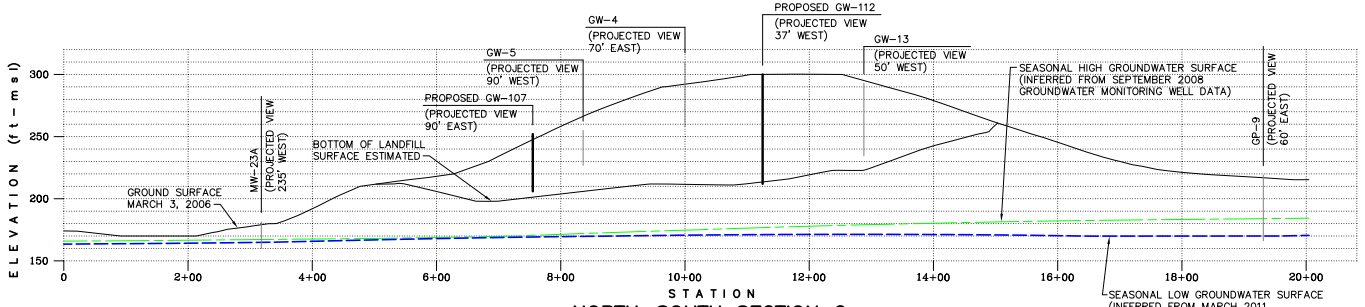

NORTH–SOUTH SECTION C

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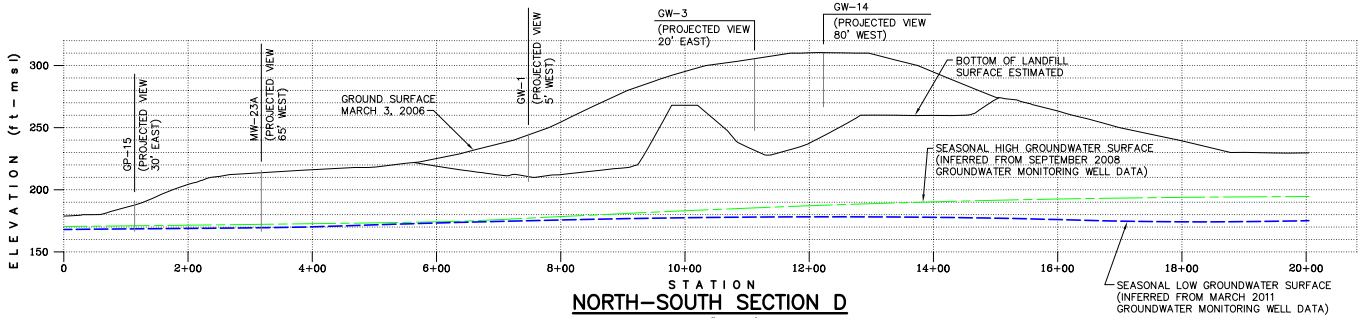

NORTH–SOUTH SECTION D

SCALE: 1" = 100'

NOT FOR CONSTRUCTION
REVIEW SUBMITTAL

GRAPHIC SCALE:

100 0 100 200

HORIZONTAL SCALE IN FEET

NO.	REVISION	DATE
1	ISSUED FOR CLIENT REVIEW	7/27/11
2	ISSUED FOR CLIENT REVIEW	9/3/11

SHEET TITLE: LANDFILL NORTH-SOUTH SECTIONS

PROJECT TITLE: 2011 GAS SYSTEM EXPANSION
LANDFILL GAS COLLECTION & CONTROL SYSTEM (GCCS)
OLYMPIC VIEW SANITARY LANDFILL

OLYMPIC VIEW SANITARY LANDFILL, INC.

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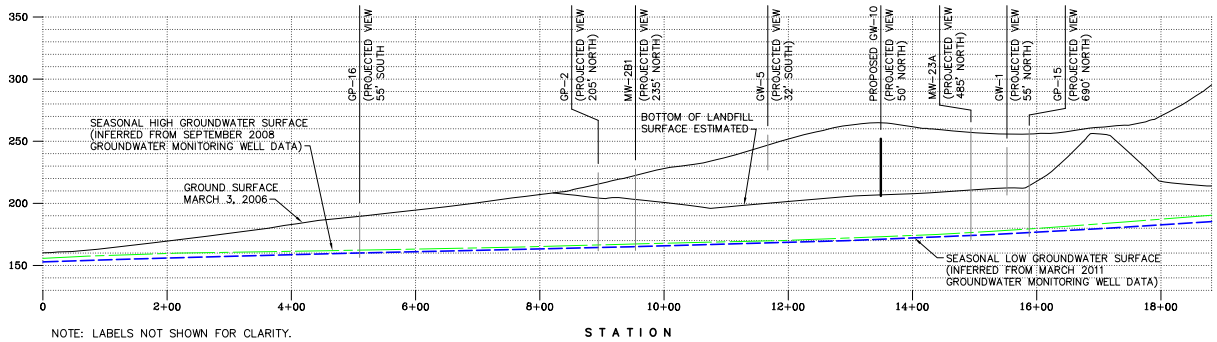
PROJ. NO.: 07207008.10 | DSN. BY: LEL | ACAD FILE: 2
DSN. BY: TAM | CHK. BY: TAM | APP. BY: JMR

DATE: JULY 2011

SCALE: 1" = 100' (22x34 SHEET)

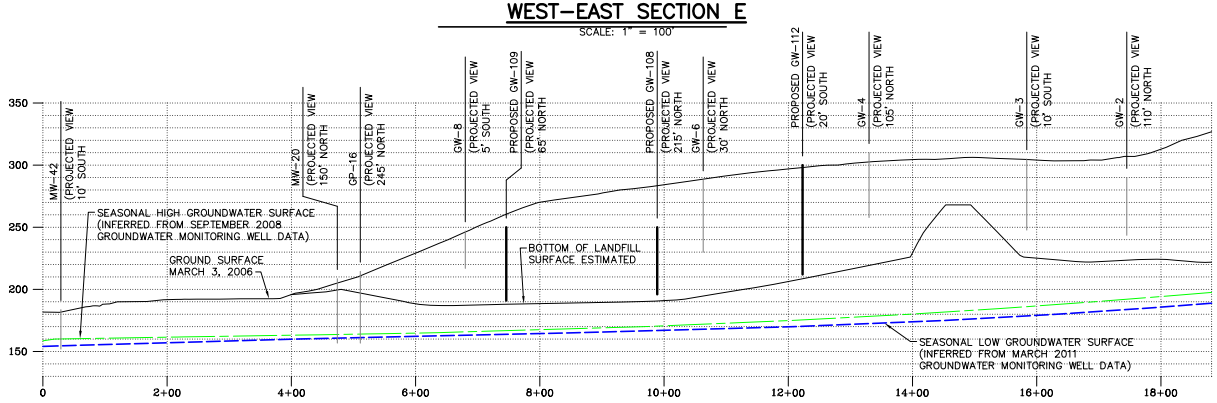
FIGURE NO. 2



NOTE: LABELS NOT SHOWN FOR CLARITY.

WEST–EAST SECTION E

SCALE: 1" = 100'



NOTE: LABELS NOT SHOWN FOR CLARITY.

WEST–EAST SECTION F

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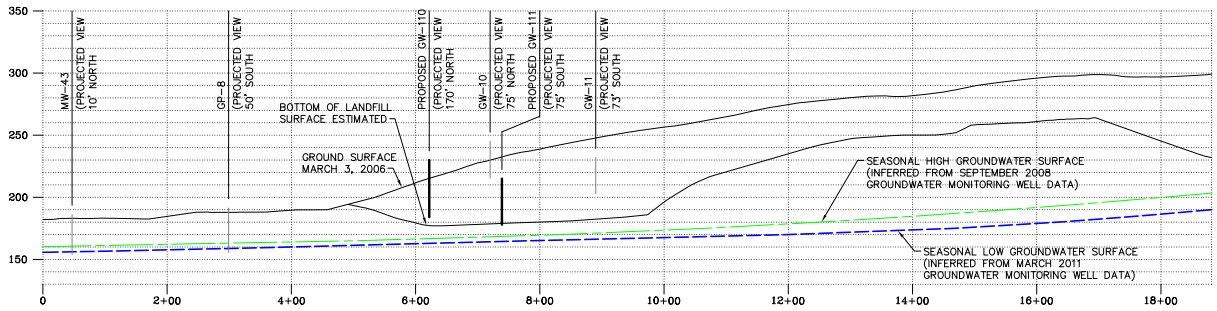

NOTE: LABELS NOT SHOWN FOR CLARITY.

WEST–EAST SECTION G

SCALE: 1" = 100'

NOT FOR CONSTRUCTION
REVIEW SUBMITTAL

GRAPHIC SCALE:

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SCALE IN FEET

NO.	REVISION	DATE
1	ISSUED FOR CLIENT REVIEW	7/27/11
2	ISSUED FOR CLIENT REVIEW	8/3/11

SHEET TITLE: LANDFILL WEST-EAST SECTIONS

PROJECT TITLE: 2011 GAS SYSTEM EXPANSION
LANDFILL GAS COLLECTION & CONTROL SYSTEM (GCCS)
OLYMPIC VIEW SANITARY LANDFILL

OLYMPIC VIEW SANITARY LANDFILL, INC.

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PROJ. NO.: 07207008.10 | DSN. BY: LEL | ACAD FILE: 3
DSN. BY: TAM | CHK. BY: TAM | APP. BY: JMR

DATE: JULY 2011

SCALE: 1" = 100' (22x34 SHEET)

DRAWING NO. 3

Attachment A

Existing Gas Well Vacuum Influence Test

Vacuum Influence Test

SCS Engineers
OBWL Area
7207006.10
Olympic View Landfill
Waste Management
14-Jun-11

1. Shut off all wells to Old Barney White Landfill (OBWL) area (GW-1 through 16) and gas wells in Phase 1 & 2 area immediately adjacent to OBWL. (GW-38, 77, 78, 28, 95, & 96)

2. Wait 1 hour.

3. Conduct test on one well to (GW-5) to establish response time using the following procedure.
   a. Open valve to wide open position
   b. Record vacuum on this gas well and the immediately adjacent gas wells and probes.
   c. Repeat vacuum measurement at 15, 30, 45 and 60 minute intervals for 1 hour
   d. Record the gas well and gas probe pressures on the following Table.

Target Gas Well	Gas Well or Gas Probe ID	Immediately after opening valve (in. H_2O)	After 15 minutes (in. H_2O)	After 30 minutes (in. H_2O)	After 45 minutes (in. H_2O)	After 60 minutes (in. H_2O)
GW-5	GW-5	-20.5	-20.4	-20.4	-20.5	-20.5
	GW-1	-0.45	-0.45	-0.42	-0.4	-0.41
	GW-4	-0.74	-0.74	-0.74	-0.7	-0.7
	GW-6	0.67	0.69	0.72	0.79	0.81
	GW-7	0.61	0.62	0.64	0.66	0.7
	Gas Probe -2	Not Found				

4. Conduct test on all wells (GW-1 through 14) in the following sequence:
   a. First test GW-1, 2, 3, & 14
   b. Next, open gas wells GW-38, 77, 78, 28, 95, & 96 and reset to original vacuum and flow conditions prior to test
   c. Continue tests with remaining wells.

5. Conduct test on individual wells using the following procedure.
   a. Select a single gas well for testing
   b. Open valve to wide open position and wait before measuring vacuum (according to the response time determined in step 3 above).
   c. Record the maixmum vacuum on this gas well and the immediately adjacent gas wells and gas probes.
   d. Adjust valve to 2/3 maximum vacuum and wait before measuring vacuum (according to the response time determined in step 3 above).
   e. Record the vacuum on this gas well and the immediately adjacent gas wells and gas probes.
   f. Adjust valve to 1/3 maximum vacuum and wait before measuring vacuum (according to the response time determined in step 3 above).
   g. Record the vacuum on this gas well and the immediately adjacent gas wells and gas probes.
   h. Close valve on this well.

6. Repeat step 5 for all remainder of wells in the OBWL area (GW-1 through 14, including well used for testing response time).

7. Record the gas well and gas probe pressures on the following Table.

Target Gas Well	Gas Well or Gas Probe ID	Maximum Vacuum (in. H_2O)	2/3 Vacuum (in. H_2O)	1/3 Vacuum (in. H_2O)
GW-1	GW-1	-21.3	-14.2	-7.1
	GW-2	-0.15	-0.15	-0.17
	GW-3	-0.21	-0.2	-0.18
	GW-4	-0.69	-0.64	-0.61
	GW-5	-0.53	-0.5	-0.44

Target Gas Well	Gas Well or Gas Probe ID	Maximum Vacuum (in. H_2O)	2/3 Vacuum (in. H_2O)	1/3 Vacuum (in. H_2O)
GW-8	GW-8	-20.8	-13.8	-6.9
	GW-7	0.65	0.66	0.7
	GW-9	-0.54	-0.53	-0.51
	GW-10	-0.19	-0.16	-0.13
	Gas Probe 16	0	0	0

Target Gas Well	Gas Well or Gas Probe ID	Maximum Vacuum (in. H_2O)	2/3 Vacuum (in. H_2O)	1/3 Vacuum (in. H_2O)
GW-2	GW-2	-20.1	-12.5	-6.3
	GW-1	-0.63	-0.6	-0.52
	GW-3	-0.18	-0.17	-0.16
	GW-4	-0.59	-0.57	-0.55
	GW-14	-3.1	-3.1	-3

Target Gas Well	Gas Well or Gas Probe ID	Maximum Vacuum (in. H_2O)	2/3 Vacuum (in. H_2O)	1/3 Vacuum (in. H_2O)
GW-9	GW-9	-21.1	-14	-7
	GW-6	-0.76	-0.73	-0.71
	GW-7	0.68	0.7	0.72
	GW-8	-0.44	-0.43	-0.41
	GW-10	-0.14	-0.13	-0.12
	GW-11	-0.28	-0.24	-0.25
	GW-12	-0.04	-0.01	0

Target Gas Well	Gas Well or Gas Probe ID	Maximum Vacuum (in. H_2O)	2/3 Vacuum (in. H_2O)	1/3 Vacuum (in. H_2O)
GW-3	GW-3	-20.9	-13.8	-6.9
	GW-1	-0.62	-0.61	-0.59
	GW-2	-0.14	-0.13	-0.11
	GW-4	-0.57	-0.53	-0.5
	GW-14	-3.1	-3	-3
	GW-15	-1.1	-1.1	-1
	GW-16	-0.35	-0.35	-0.35

Target Gas Well	Gas Well or Gas Probe ID	Maximum Vacuum (in. H_2O)	2/3 Vacuum (in. H_2O)	1/3 Vacuum (in. H_2O)
GW-10	GW-10	-21	-14	-7
	GW-8	-0.43	-0.41	-0.39
	GW-9	-0.47	-0.47	-0.46
	GW-11	-0.26	-0.25	-0.23
	GW-12	-0.01	0	0.01
	Gas Probe 8	0	0	0

Target Gas Well	Gas Well or Gas Probe ID	Maximum Vacuum (in. H_2O)	2/3 Vacuum (in. H_2O)	1/3 Vacuum (in. H_2O)
GW-4	GW-4	-21.5	-14.2	-7.1
	GW-1	-0.62	-0.59	-0.58
	GW-2	-0.14	-0.12	-0.13
	GW-3	-0.2	-0.19	-0.19
	GW-5	-0.52	-0.49	-0.43
	GW-6	-0.74	-0.72	-0.7
	GW-13	-0.38	-0.36	-0.34
	GW-14	-3.1	-3.1	-3.1

Target Gas Well	Gas Well or Gas Probe ID	Maximum Vacuum (in. H_2O)	2/3 Vacuum (in. H_2O)	1/3 Vacuum (in. H_2O)
GW-11	GW-11	-20.3	-13.4	-6.7
	GW-9	-0.42	-0.4	-0.39
	GW-10	-0.1	-0.08	-0.07
	GW-12	0	0.02	0.04
	Gas Probe 8	0	0	0
	Gas Probe 9	0	0	0

Target Gas Well	Gas Well or Gas Probe ID	Maximum Vacuum (in. H_2O)	2/3 Vacuum (in. H_2O)	1/3 Vacuum (in. H_2O)
GW-5	GW-5	-21.3	-14.2	-7.1
	GW-1	-0.61	-0.58	-0.57
	GW-4	-0.55	-0.53	-0.52
	GW-6	-0.72	-0.7	-0.68
	GW-7	0.67	0.71	0.74
	Gas Probe -2	Not Found		

Target Gas Well	Gas Well or Gas Probe ID	Maximum Vacuum (in. H_2O)	2/3 Vacuum (in. H_2O)	1/3 Vacuum (in. H_2O)
GW-12	GW-12	-21.2	-14.5	-7.2
	GW-6	-0.73	-0.71	-0.69
	GW-9	-0.4	-0.36	-0.33
	GW-10	-0.05	-0.03	0
	GW-11	-0.25	-0.24	-0.22
	GW-13	-0.37	-0.36	-0.33
	Gas Probe 9	0	0	0

Target Gas Well	Gas Well or Gas Probe ID	Maximum Vacuum (in. H_2O)	2/3 Vacuum (in. H_2O)	1/3 Vacuum (in. H_2O)
GW-6	GW-6	-21.5	-14.6	-7.3
	GW-4	-0.54	-0.53	-0.52
	GW-5	-0.5	-0.47	-0.45
	GW-7	0.67	0.7	0.73
	GW-9	-0.34	-0.36	-0.3
	GW-12	0.01	-0.05	-0.06
	GW-13	-0.34	-0.33	-0.31
	Gas Probe-2	Not Found		

Target Gas Well	Gas Well or Gas Probe ID	Maximum Vacuum (in. H_2O)	2/3 Vacuum (in. H_2O)	1/3 Vacuum (in. H_2O)
GW-13	GW-13	-22.1	-14.4	-7.3
	GW-4	-0.56	-0.56	-0.53
	GW-6	-0.7	-0.65	-0.63
	GW-12	-0.1	0	0.05
	GW-14	-2.9	-2.9	-2.9
	Gas Probe 9	0	0	0

Target Gas Well	Gas Well or Gas Probe ID	Maximum Vacuum (in. H_2O)	2/3 Vacuum (in. H_2O)	1/3 Vacuum (in. H_2O)
GW-7	GW-7	-22.1	-14.6	-7.3
	GW-5	-0.49	-0.48	-0.46
	GW-6	-0.64	-0.6	-0.58
	GW-8	-0.42	-0.4	-0.36
	GW-9	-0.45	-0.42	-0.46
	Gas Probe 2	Not Found		
	Gas Probe 16	0	0	0

Target Gas Well	Gas Well or Gas Probe ID	Maximum Vacuum (in. H_2O)	2/3 Vacuum (in. H_2O)	1/3 Vacuum (in. H_2O)
GW-14	GW-14	-20.6	-13.6	-6.8
	GW-3	-0.11	-0.08	0
	GW-4	-0.5	-0.47	-0.45
	GW-13	-0.35	-0.32	-0.3
	GW-15	-0.9	-0.9	-0.9
	Gas Probe 9	0	0	0

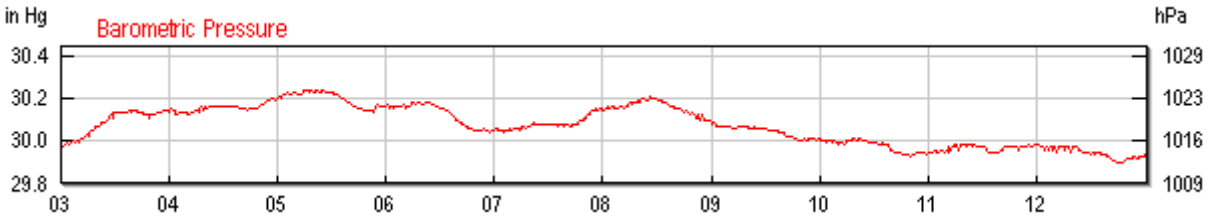
8. Open all gas wells and reset to original vacuum and flow conditions prior to test

Barometric Pressure for Olympic View Landfill

June 2011

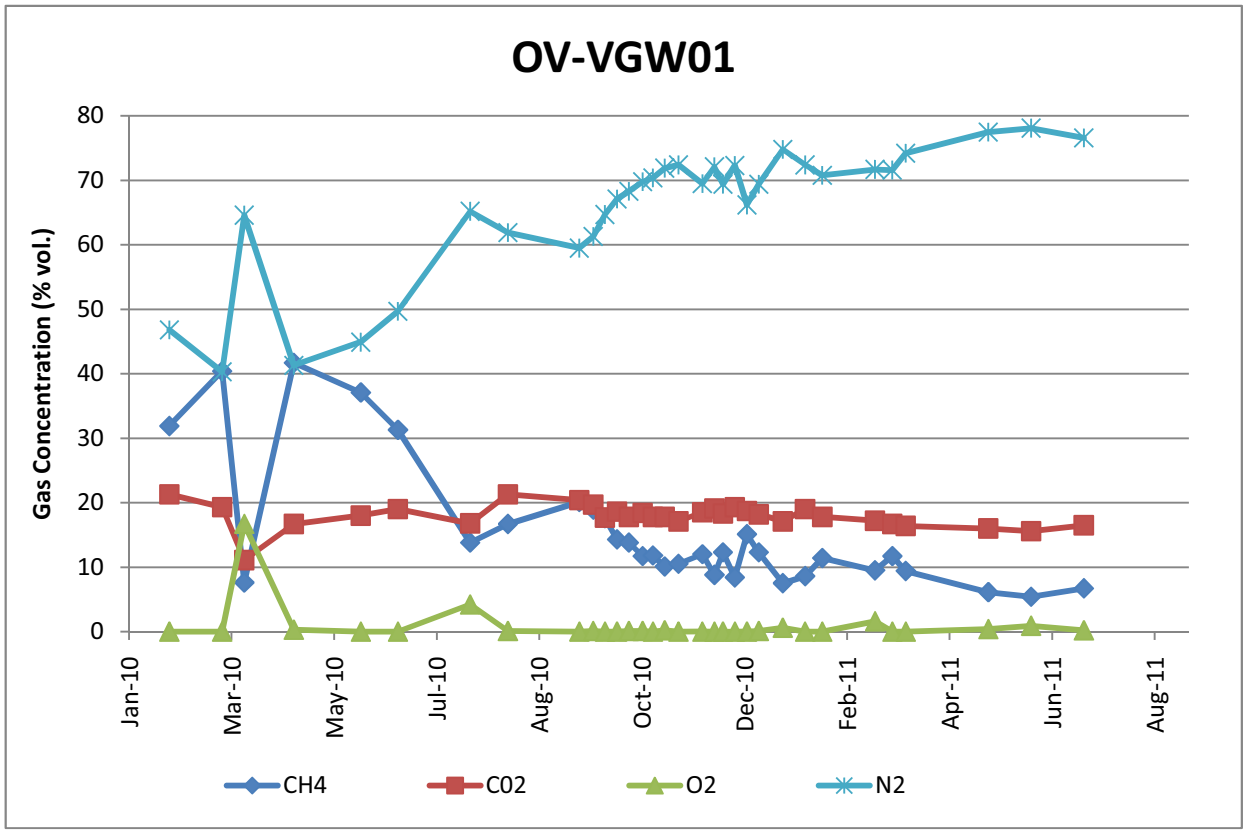
July 2011

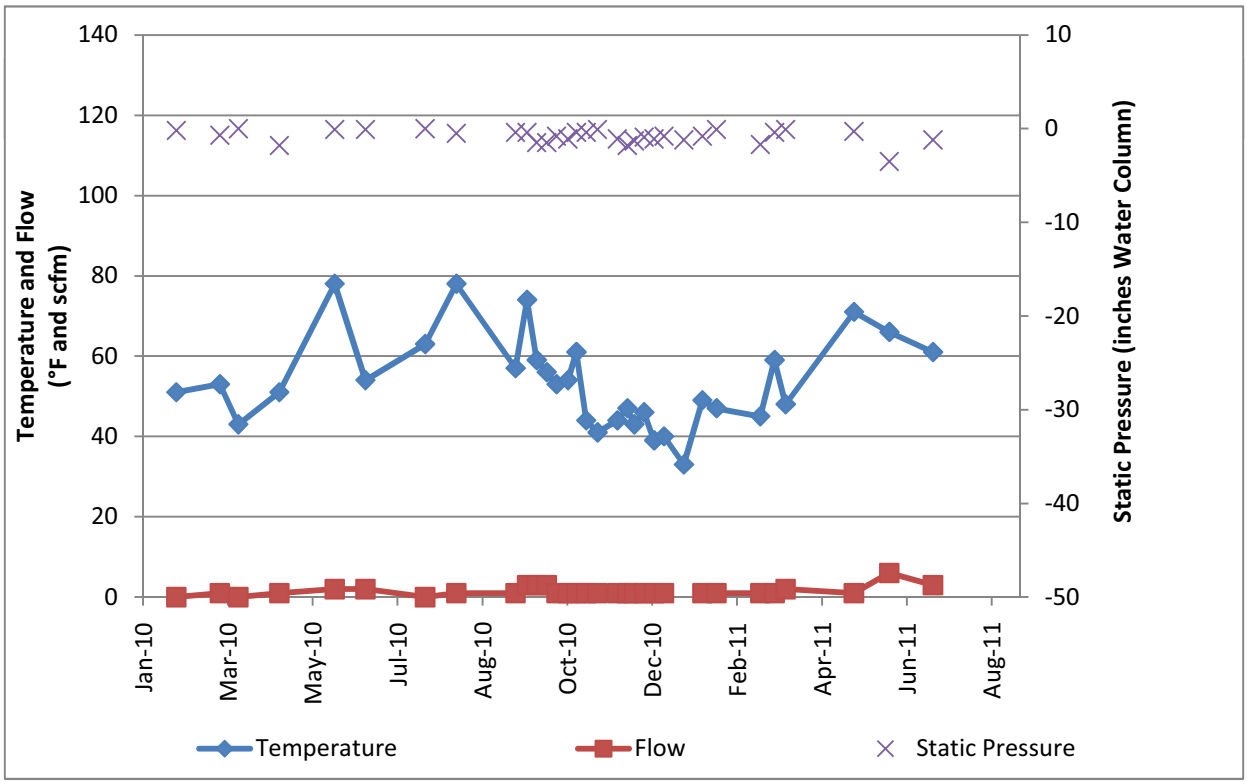
July 3 through 12, 2011

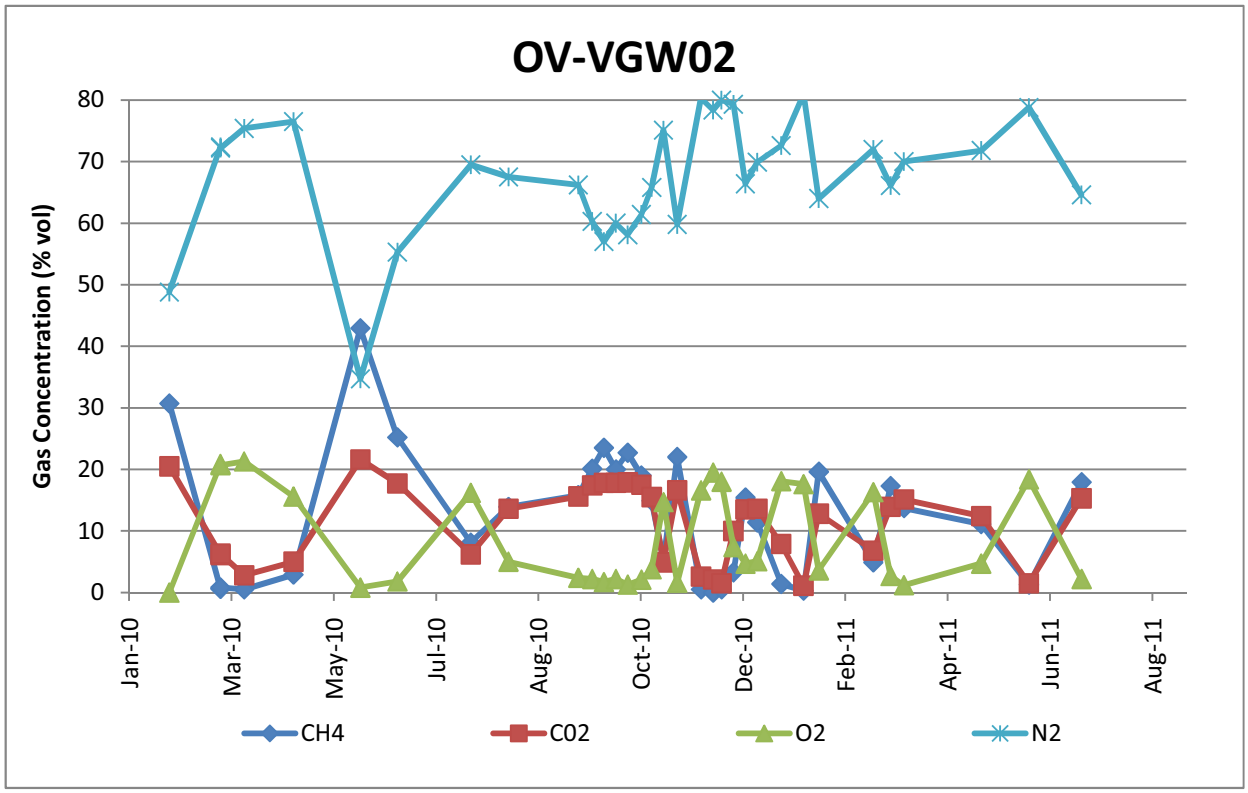


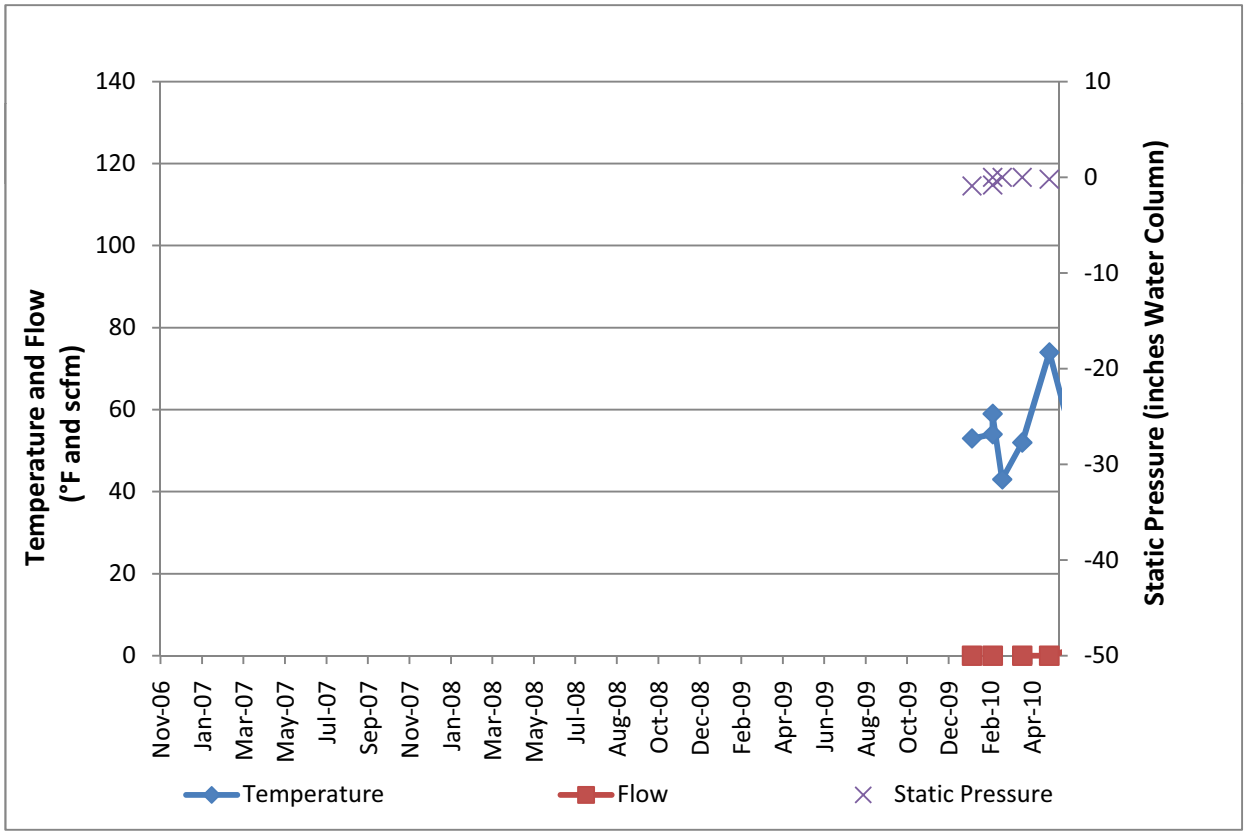
Attachment B

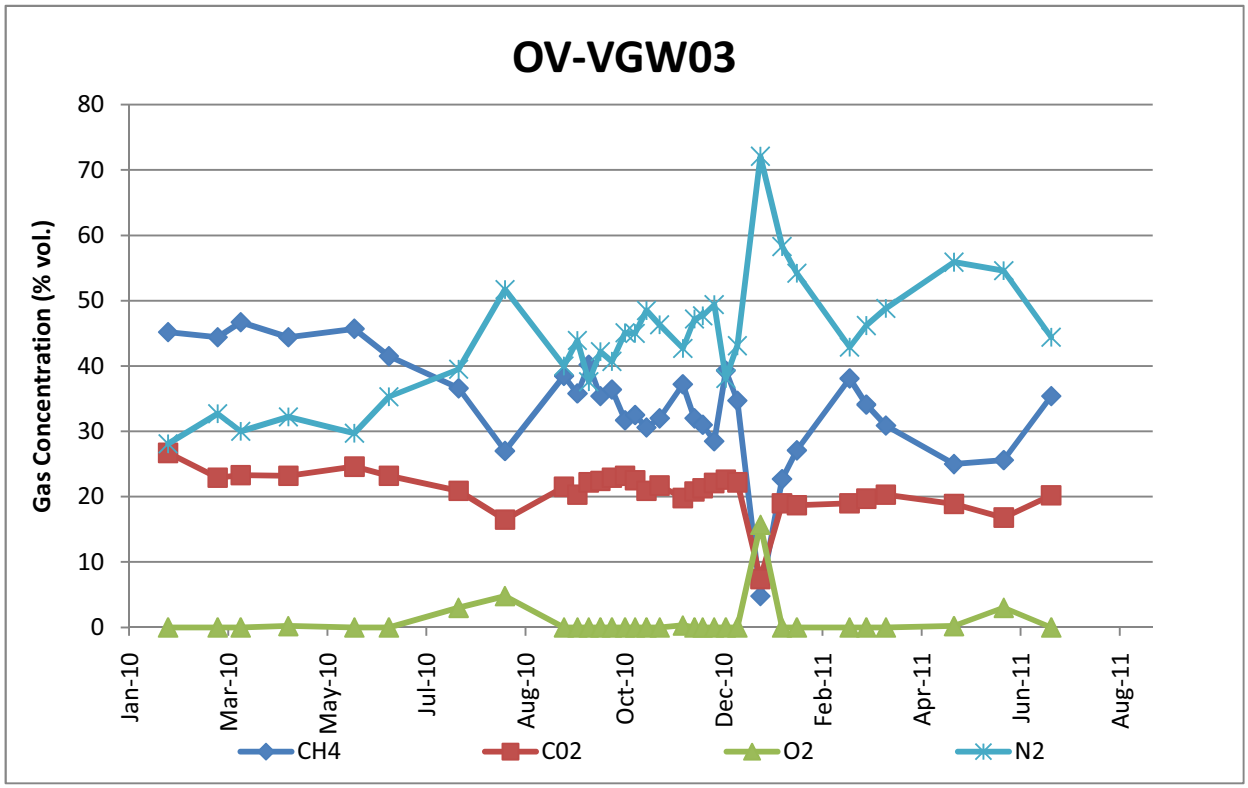
Historical Gas Well Monitoring Results

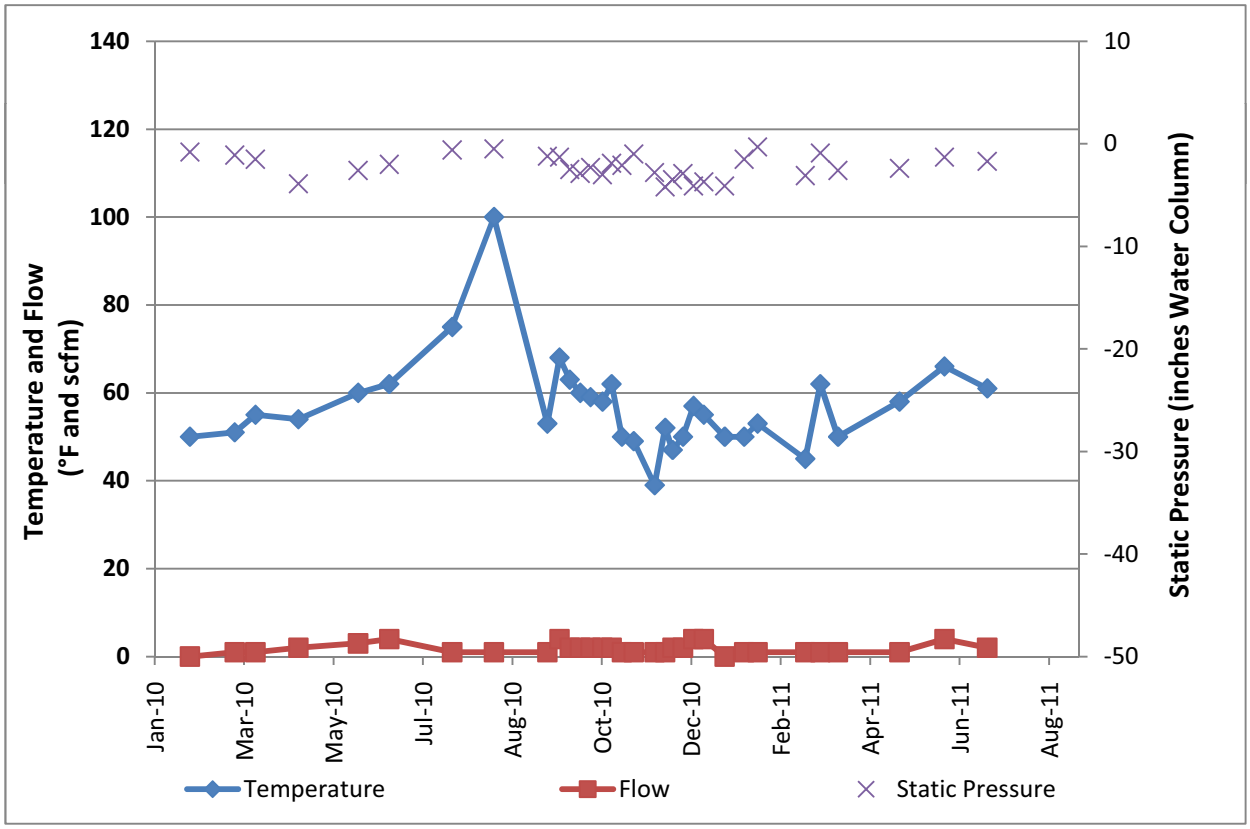

OV-VGW01
Gas Concentration (% vol.)
80
70
60
50
40
30
20
10
0
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2

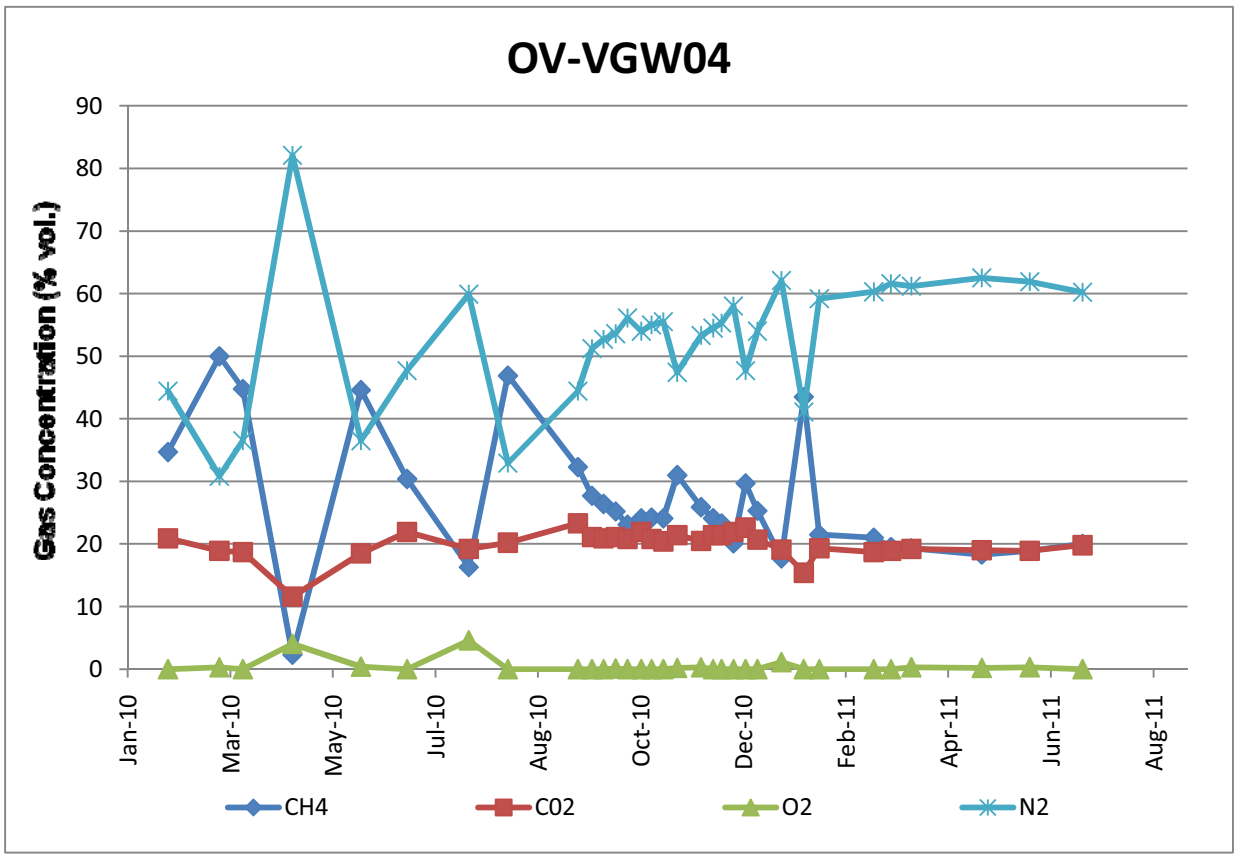

Temperature and Flow (°F and scfm)
Static Pressure (inches Water Column)
140
120
100
80
60
40
20
0
10
0
-10
-20
-30
-40
-50
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
Temperature
Flow
Static Pressure

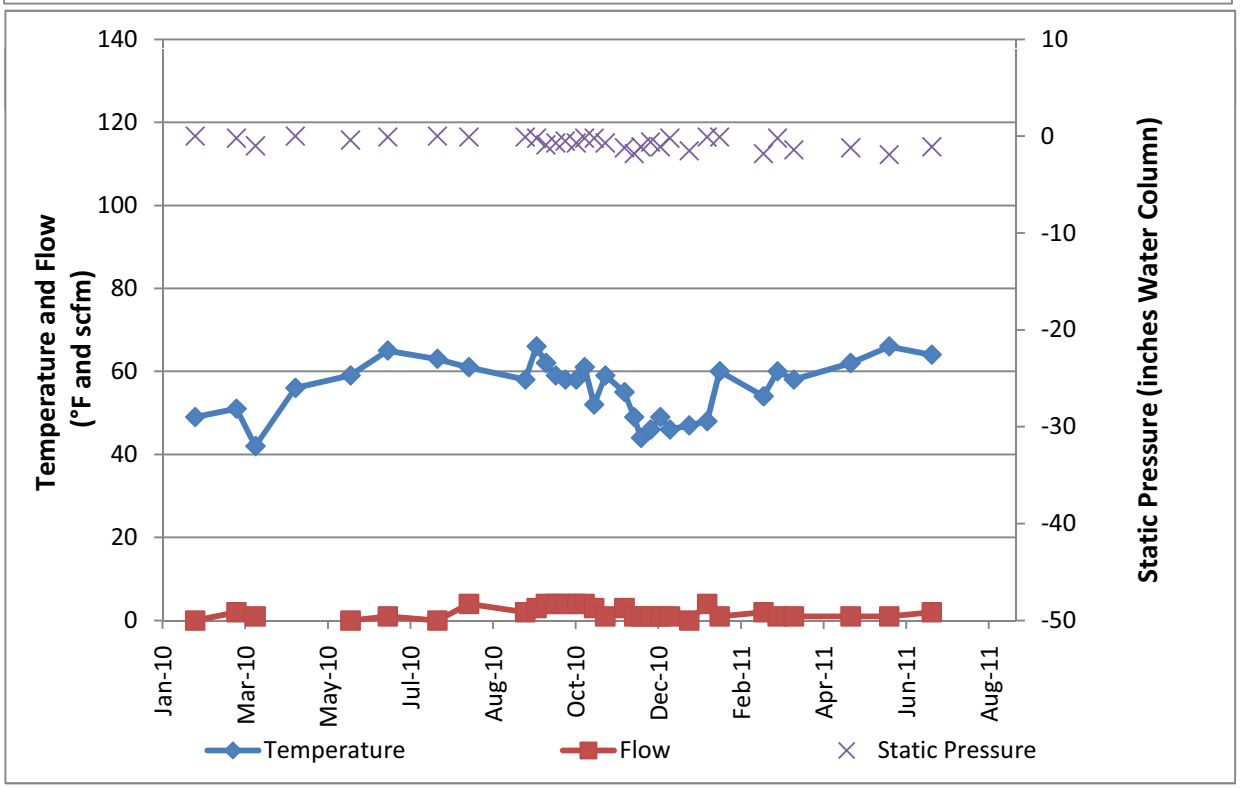

OV-VGW02
Gas Concentration (% vol)
80
70
60
50
40
30
20
10
0
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2

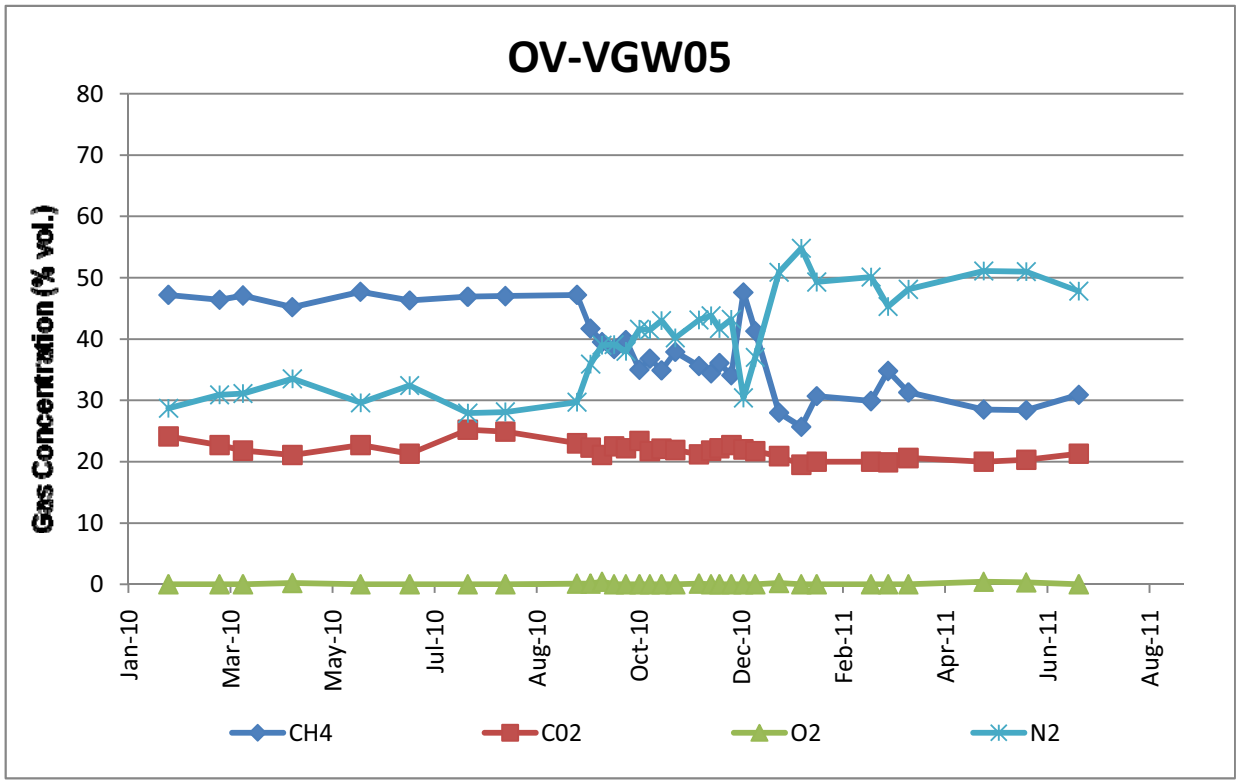

Temperature and Flow (°F and scfm)
Static Pressure (inches Water Column)
140
120
100
80
60
40
20
0
10
0
-10
-20
-30
-40
-50
Nov-06
Jan-07
Mar-07
May-07
Jul-07
Sep-07
Nov-07
Jan-08
Mar-08
May-08
Jul-08
Aug-08
Oct-08
Dec-08
Feb-09
Apr-09
Jun-09
Aug-09
Oct-09
Dec-09
Feb-10
Apr-10
Temperature
Flow
Static Pressure

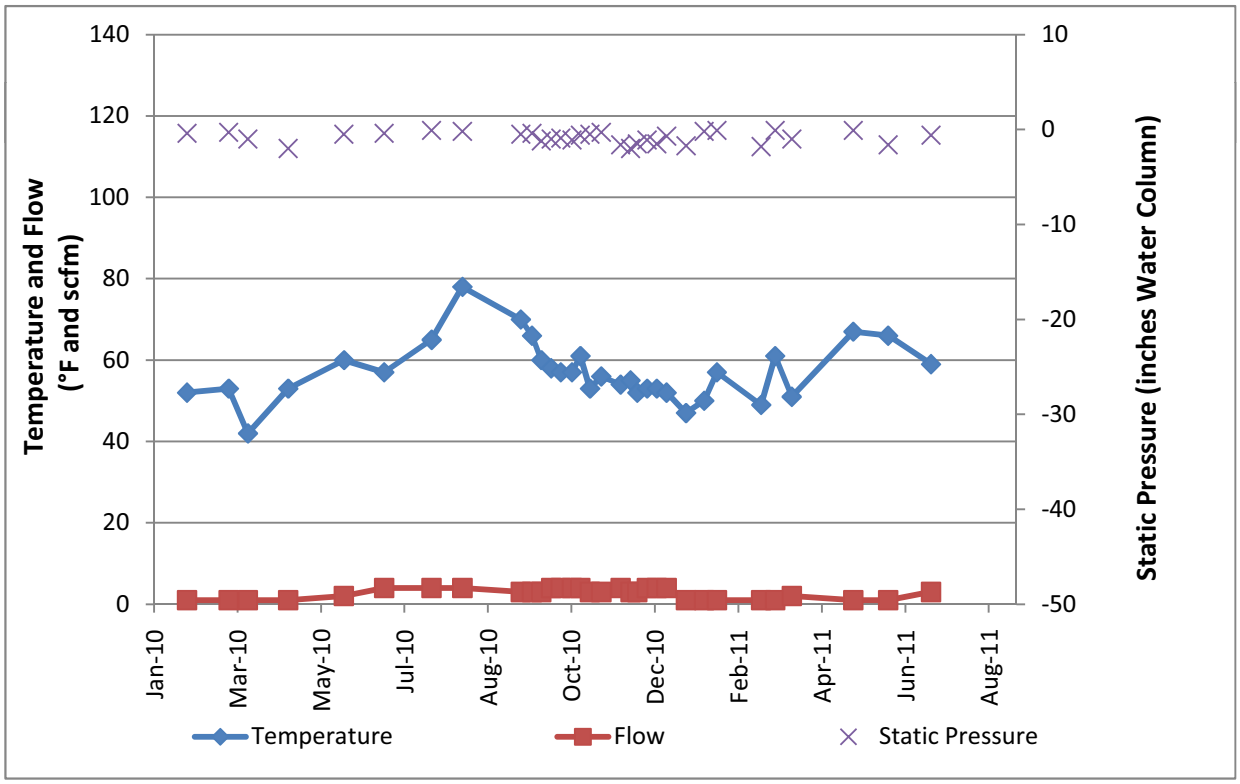

OV-VGW03
Gas Concentration (% vol.)
80
70
60
50
40
30
20
10
0
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2

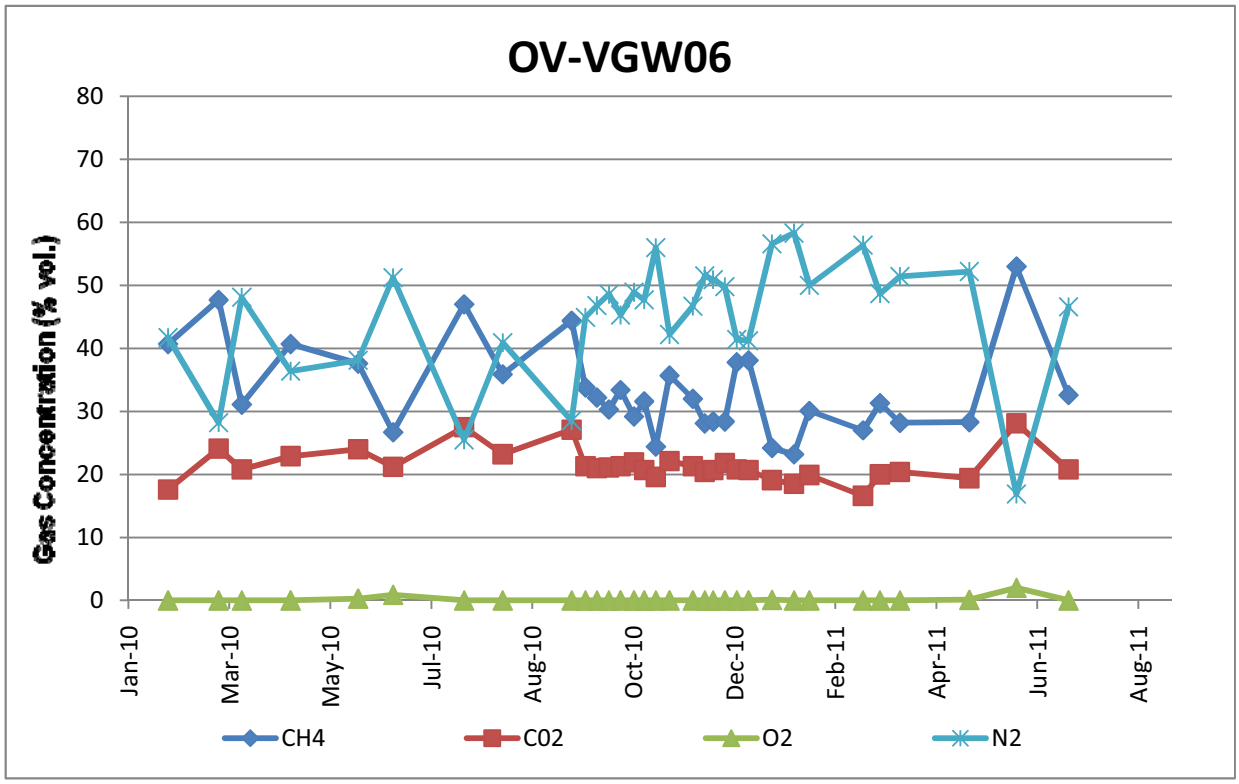

Temperature and Flow (°F and scfm)
Static Pressure (inches Water Column)
140
120
100
80
60
40
20
0
10
0
-10
-20
-30
-40
-50
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
Temperature
Flow
Static Pressure

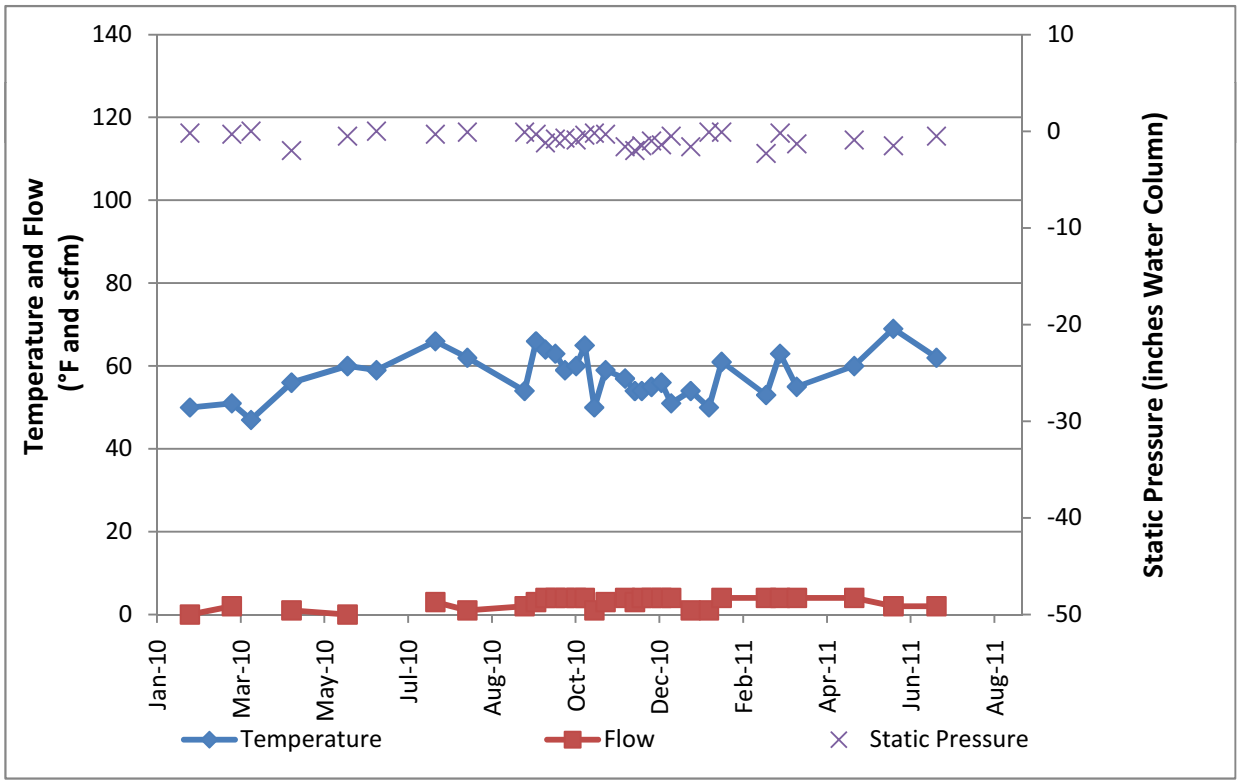

OV-VGW04
Gas Concentration (% vol.)
90
80
70
60
50
40
30
20
10
0
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2

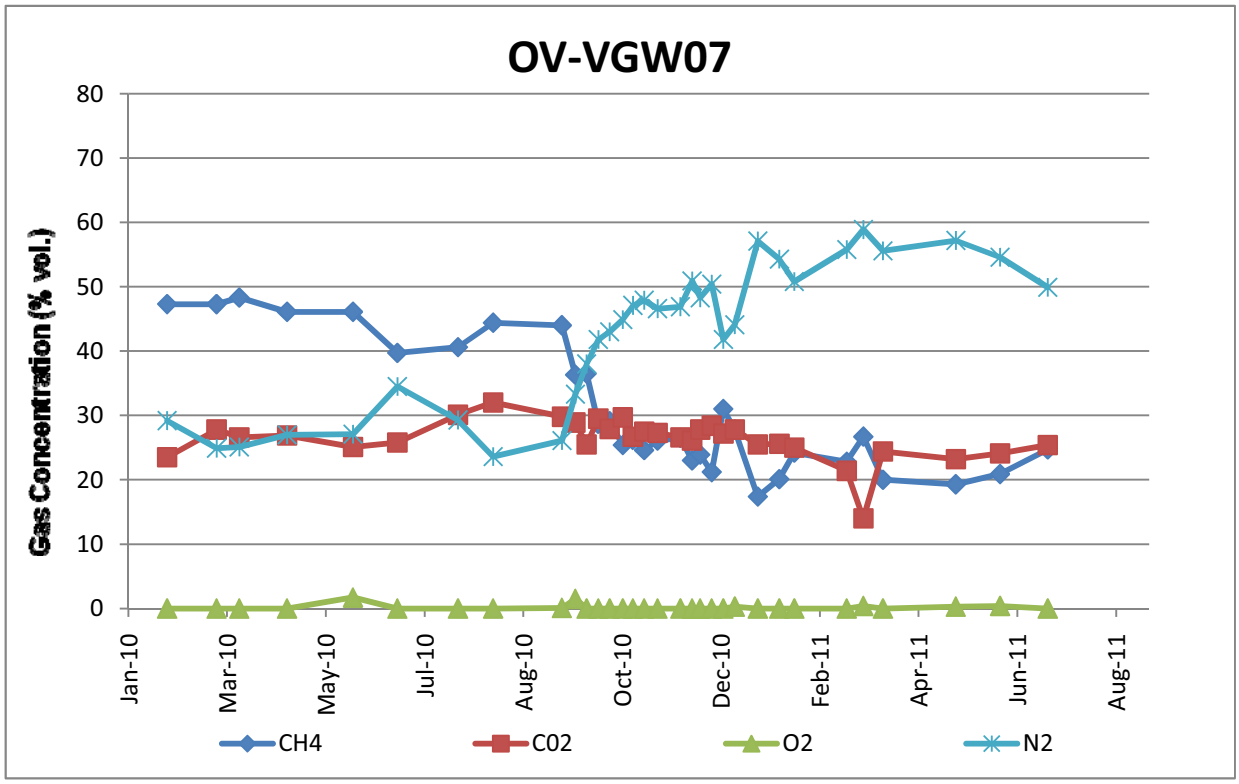

Temperature and Flow (°F and scfm)
140
120
100
80
60
40
20
0
10
0
-10
-20
-30
-40
-50
Static Pressure (inches Water Column)
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
Temperature
Flow
Static Pressure

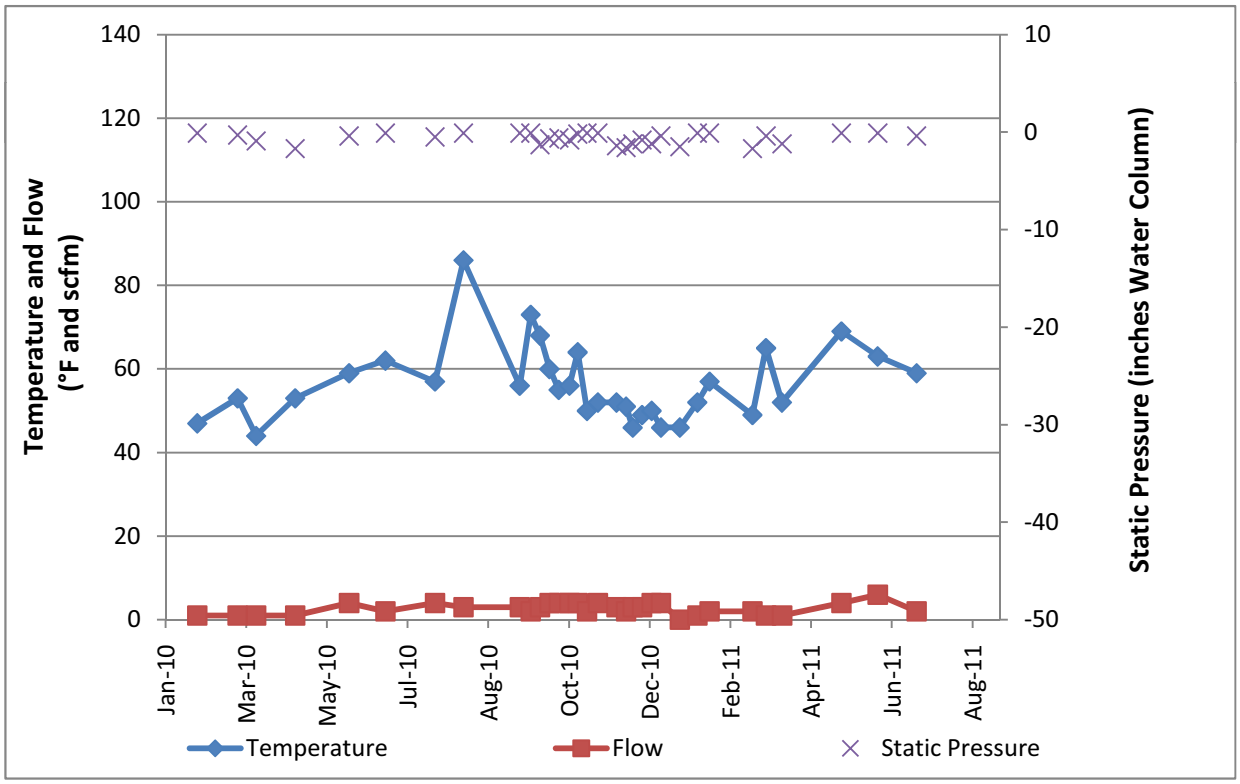

OV-VGW05
Gas Concentration (% vol.)
80
70
60
50
40
30
20
10
0
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2

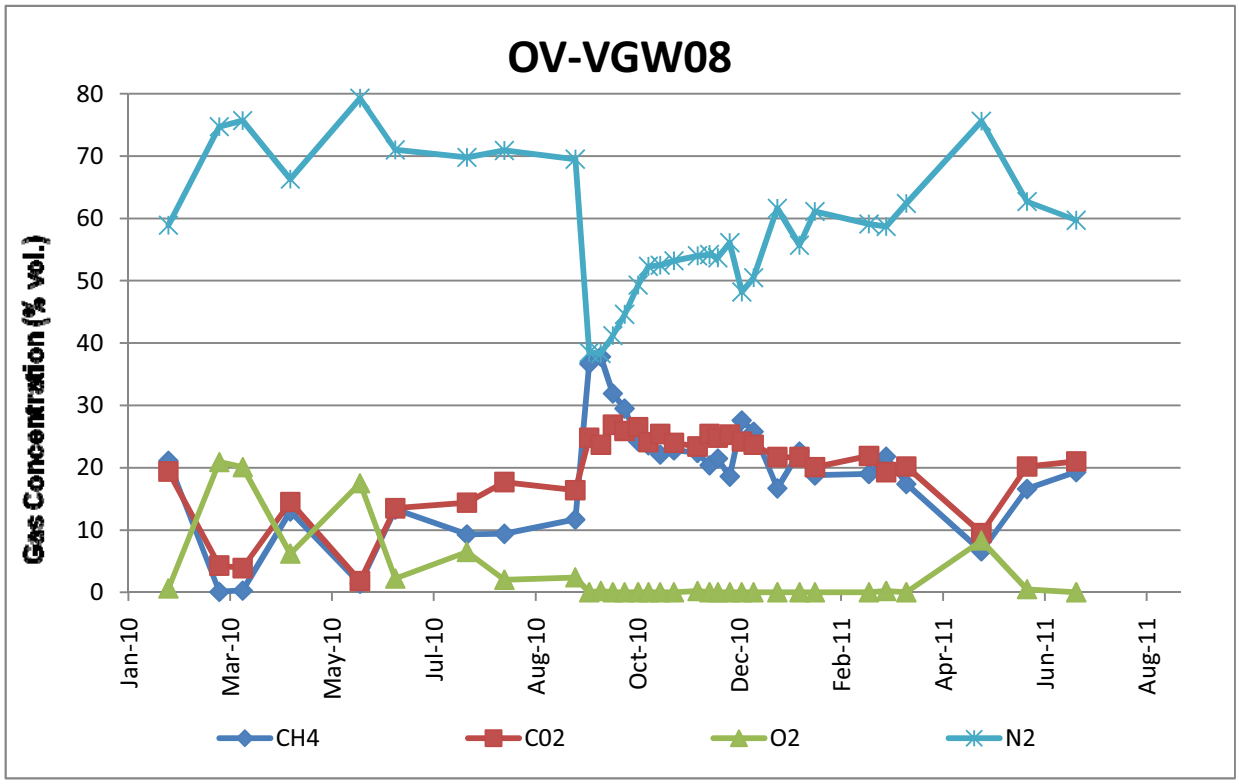

Temperature and Flow (°F and scfm)
140
120
100
80
60
40
20
0
10
0
-10
-20
-30
-40
-50
Static Pressure (inches Water Column)
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
Temperature
Flow
Static Pressure

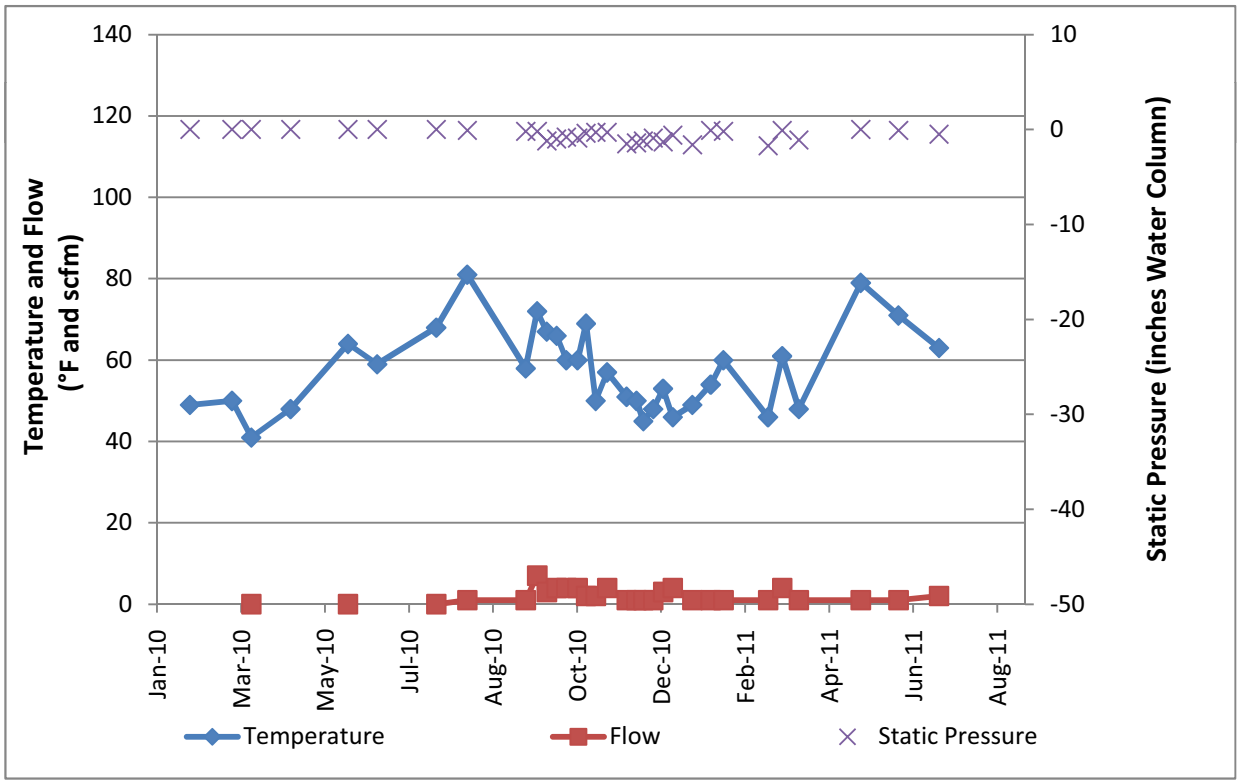

OV-VGW06
Gas Concentration (% vol.)
80
70
60
50
40
30
20
10
0
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2

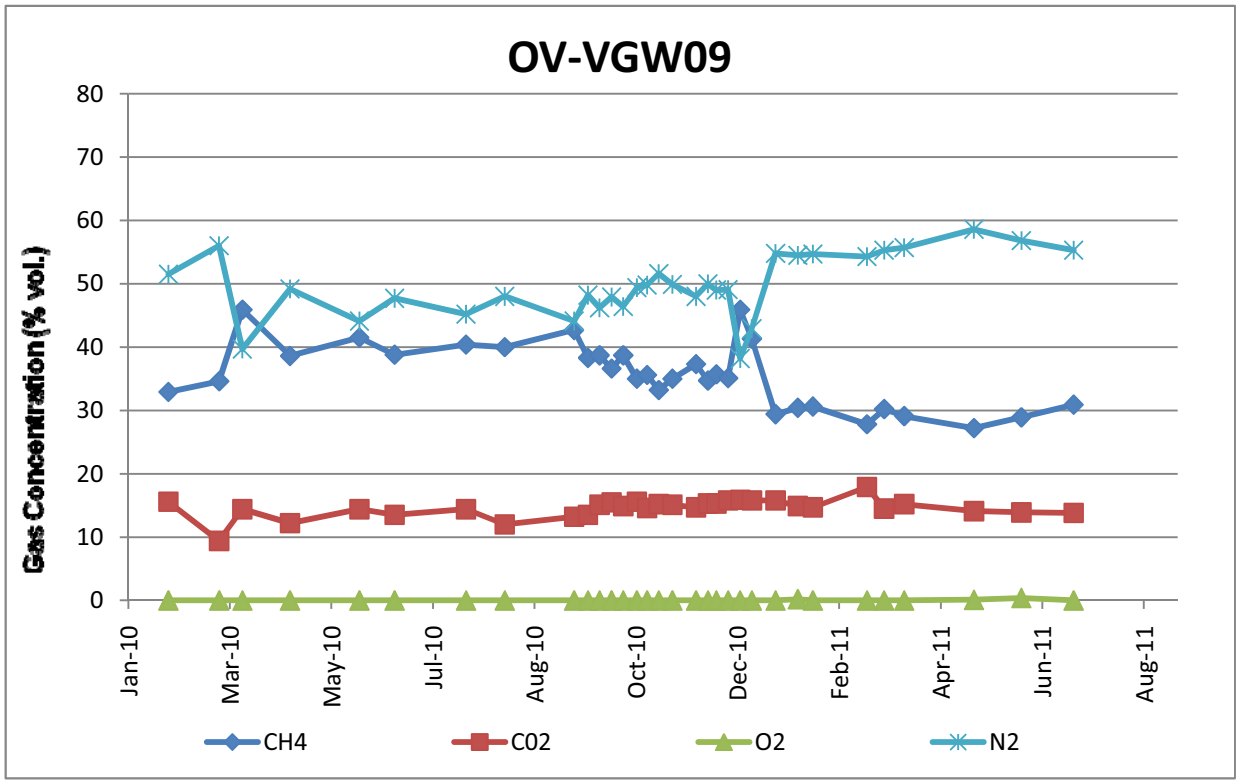

Temperature and Flow (°F and scfm)
Static Pressure (inches Water Column)
140
120
100
80
60
40
20
0
10
0
-10
-20
-30
-40
-50
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
Temperature
Flow
Static Pressure

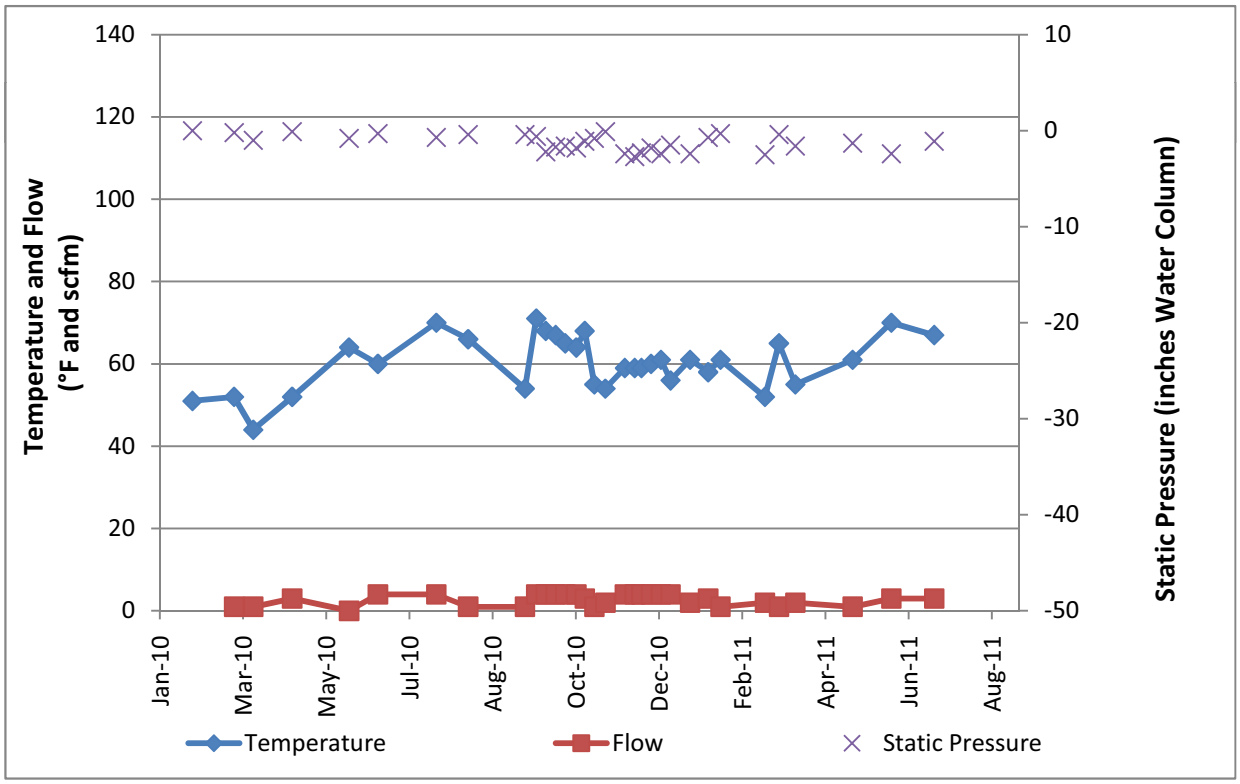

OV-VGW07
Gas Concentration (% vol.)
80
70
60
50
40
30
20
10
0
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2

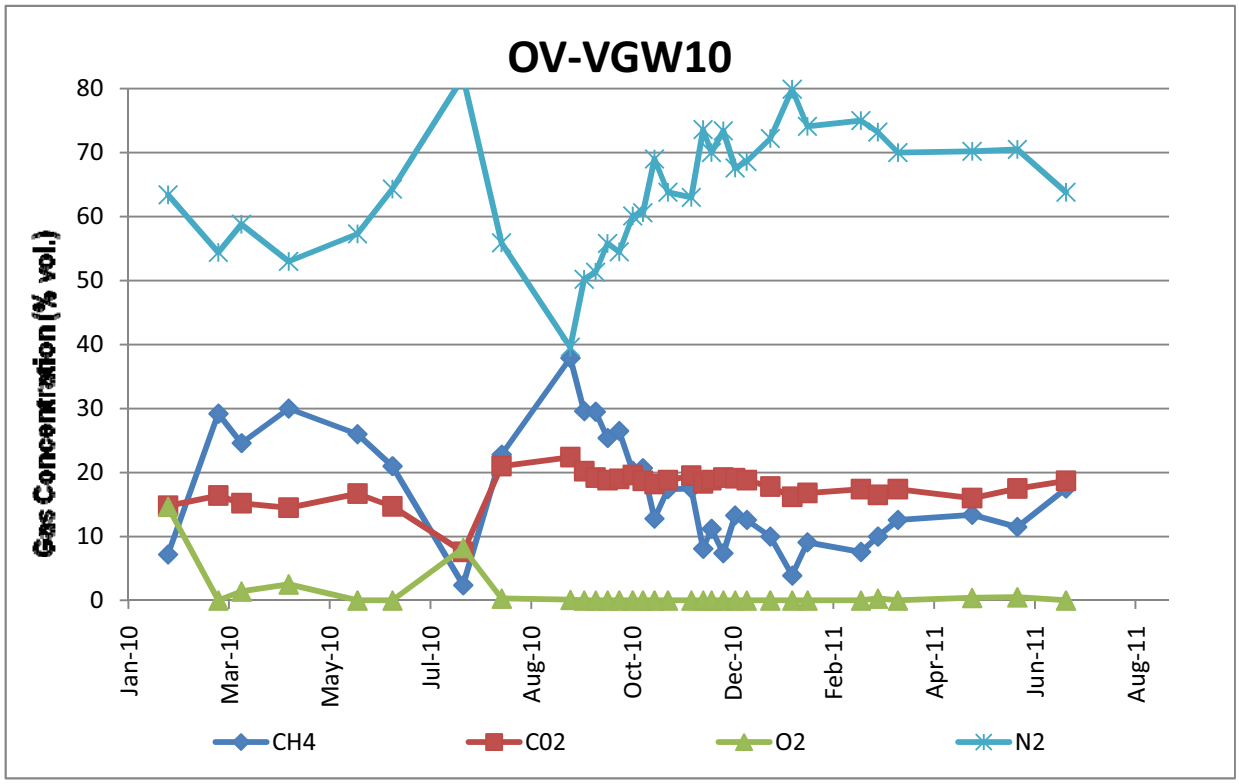

Temperature and Flow (°F and scfm)
140
120
100
80
60
40
20
0
10
0
-10
-20
-30
-40
-50
Static Pressure (inches Water Column)
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
Temperature
Flow
Static Pressure

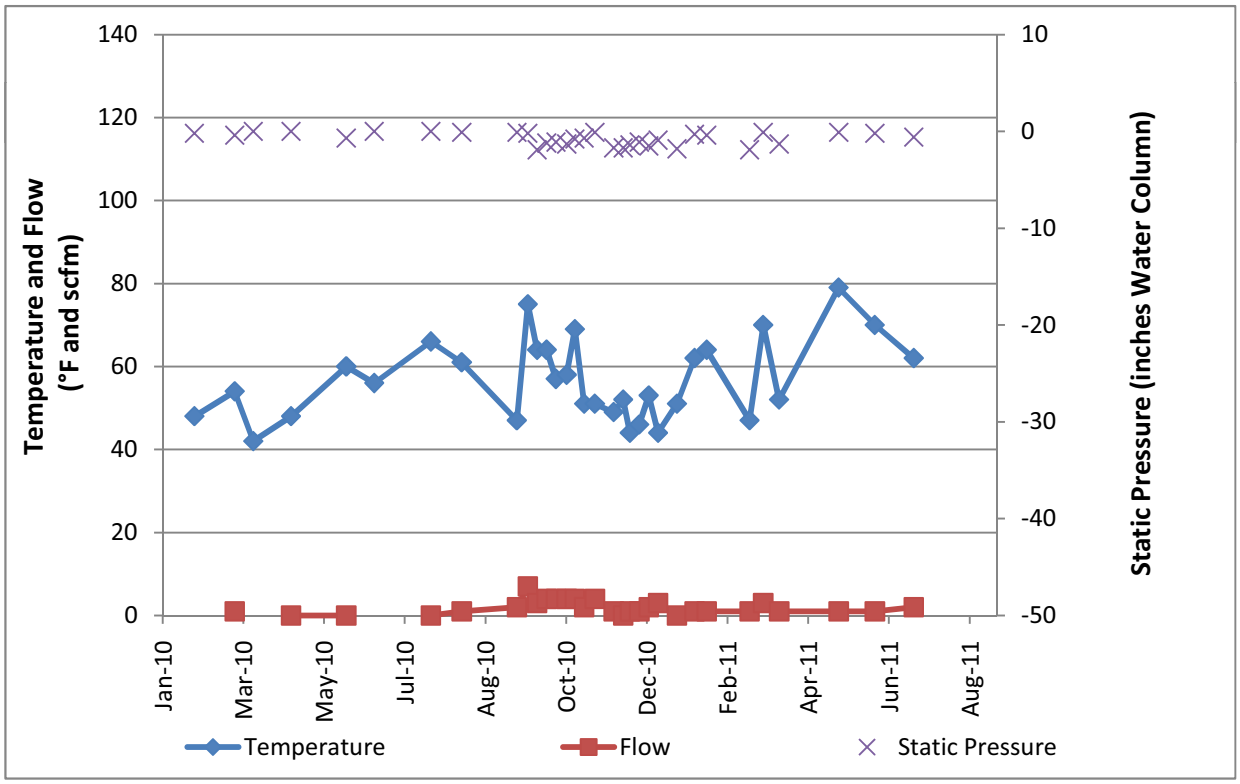

OV-VGW08
Gas Concentration (% vol.)
80
70
60
50
40
30
20
10
0
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2

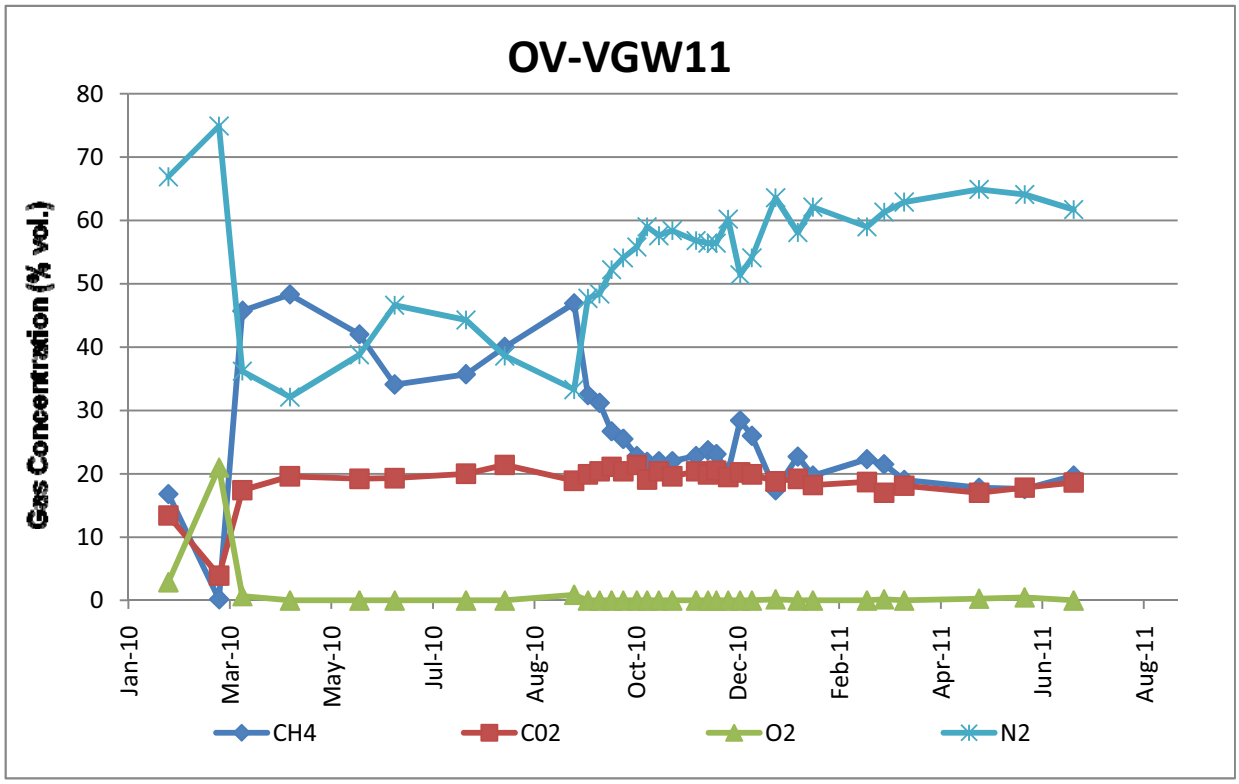

Temperature and Flow (°F and scfm)
140
120
100
80
60
40
20
0
10
0
-10
-20
-30
-40
-50
Static Pressure (inches Water Column)
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
Temperature
Flow
Static Pressure

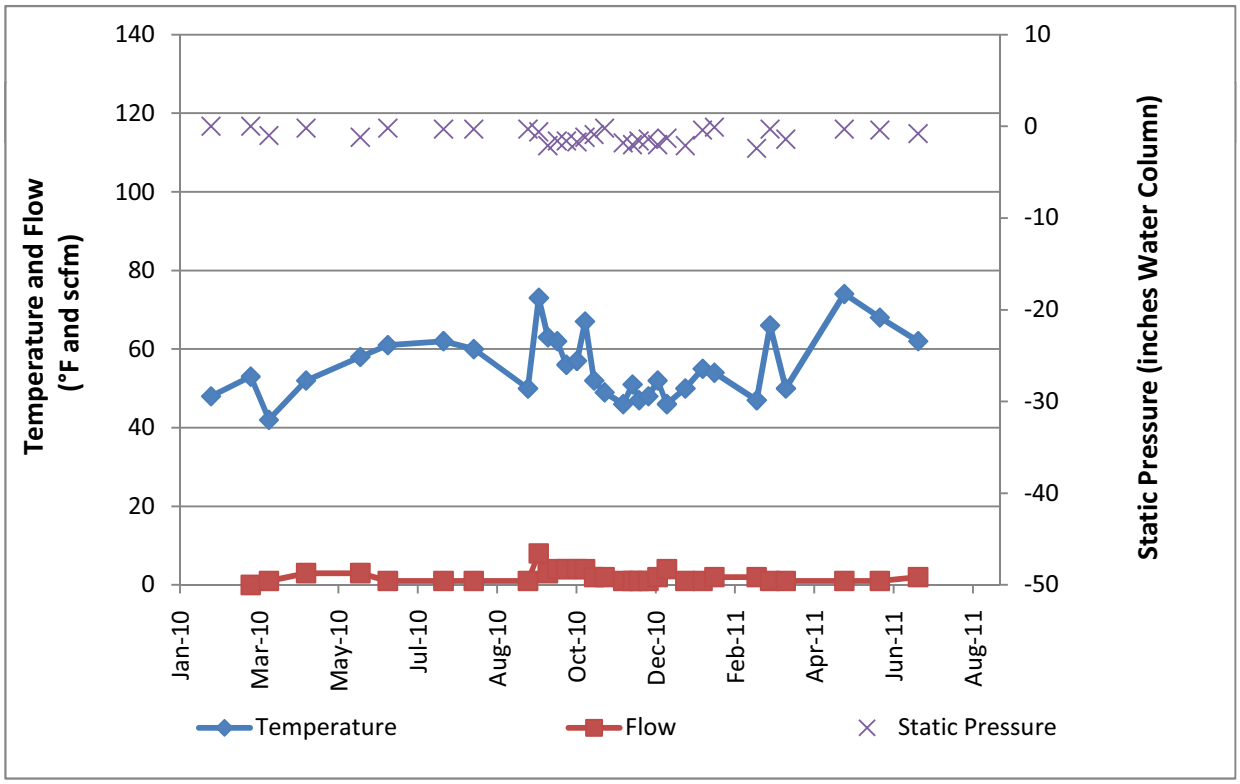

OV-VGW09
Gas Concentration (% vol.)
80
70
60
50
40
30
20
10
0
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2

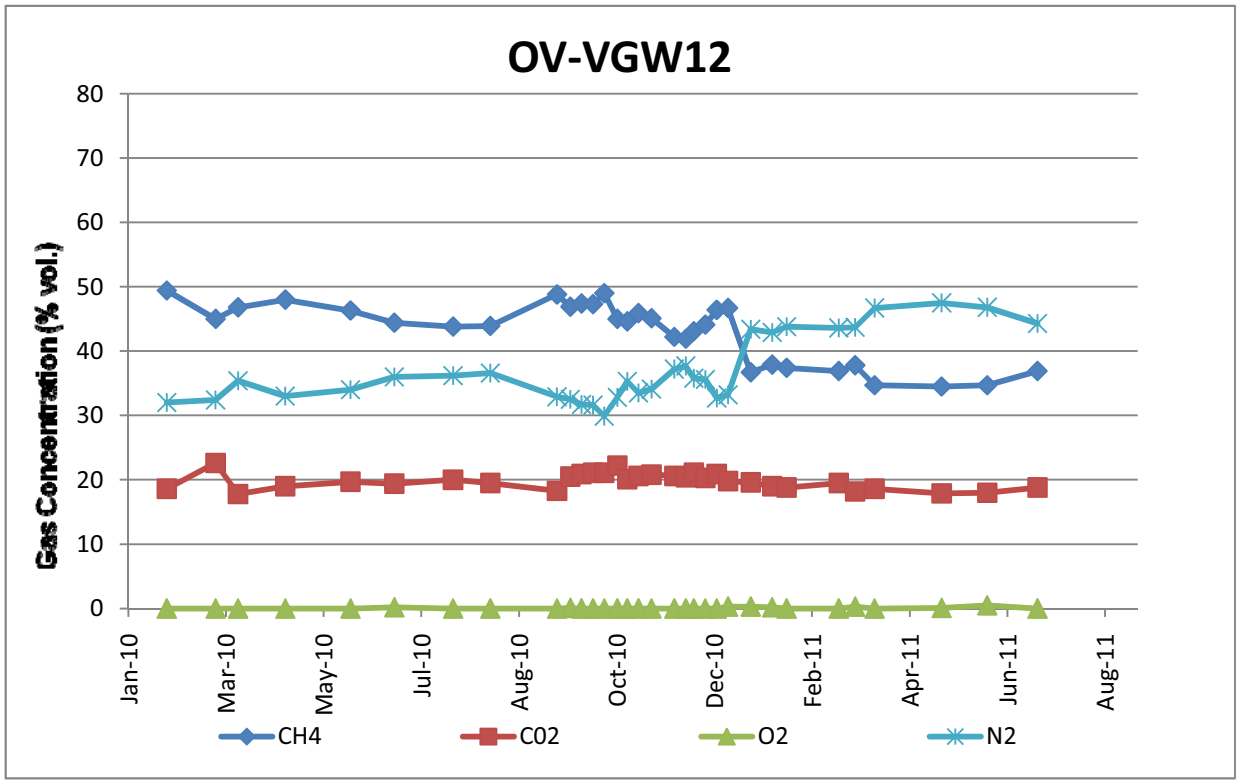

Temperature and Flow (°F and scfm)
Static Pressure (inches Water Column)
140
120
100
80
60
40
20
0
10
0
-10
-20
-30
-40
-50
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
Temperature
Flow
Static Pressure

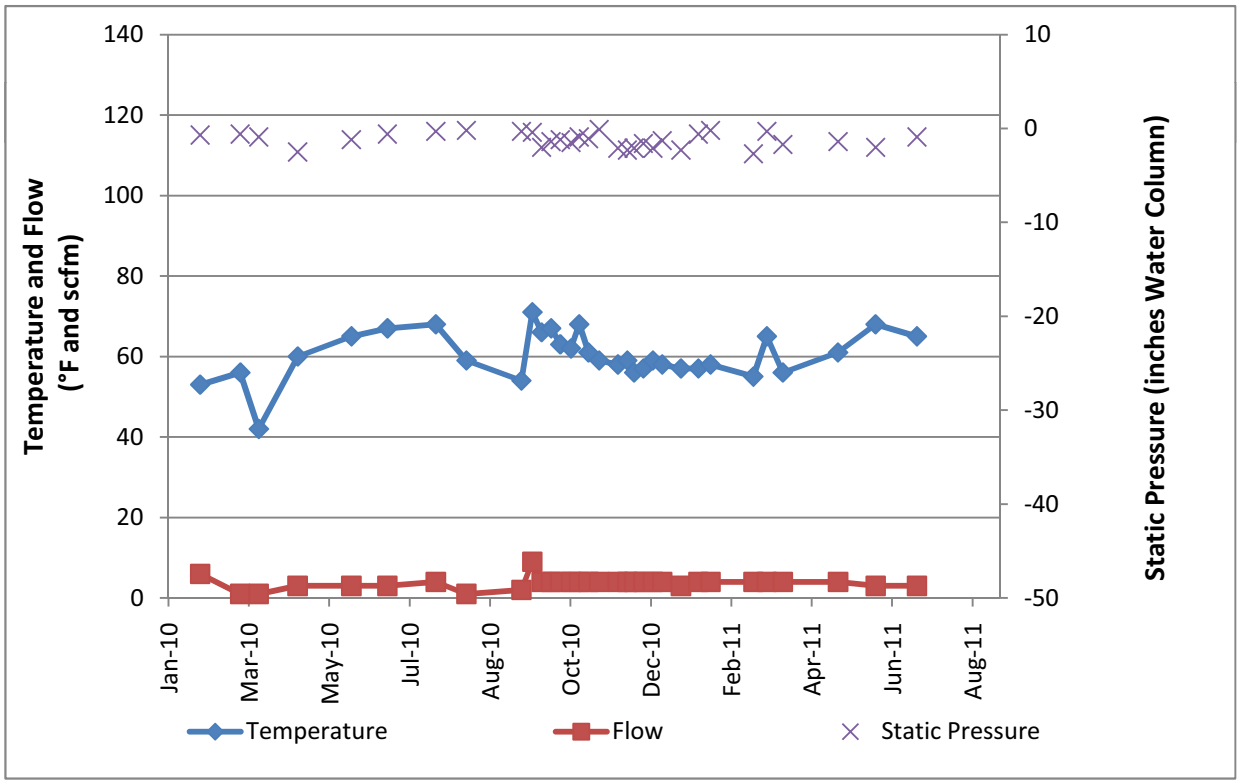

OV-VGW10
Gas Concentration (% vol.)
80
70
60
50
40
30
20
10
0
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2

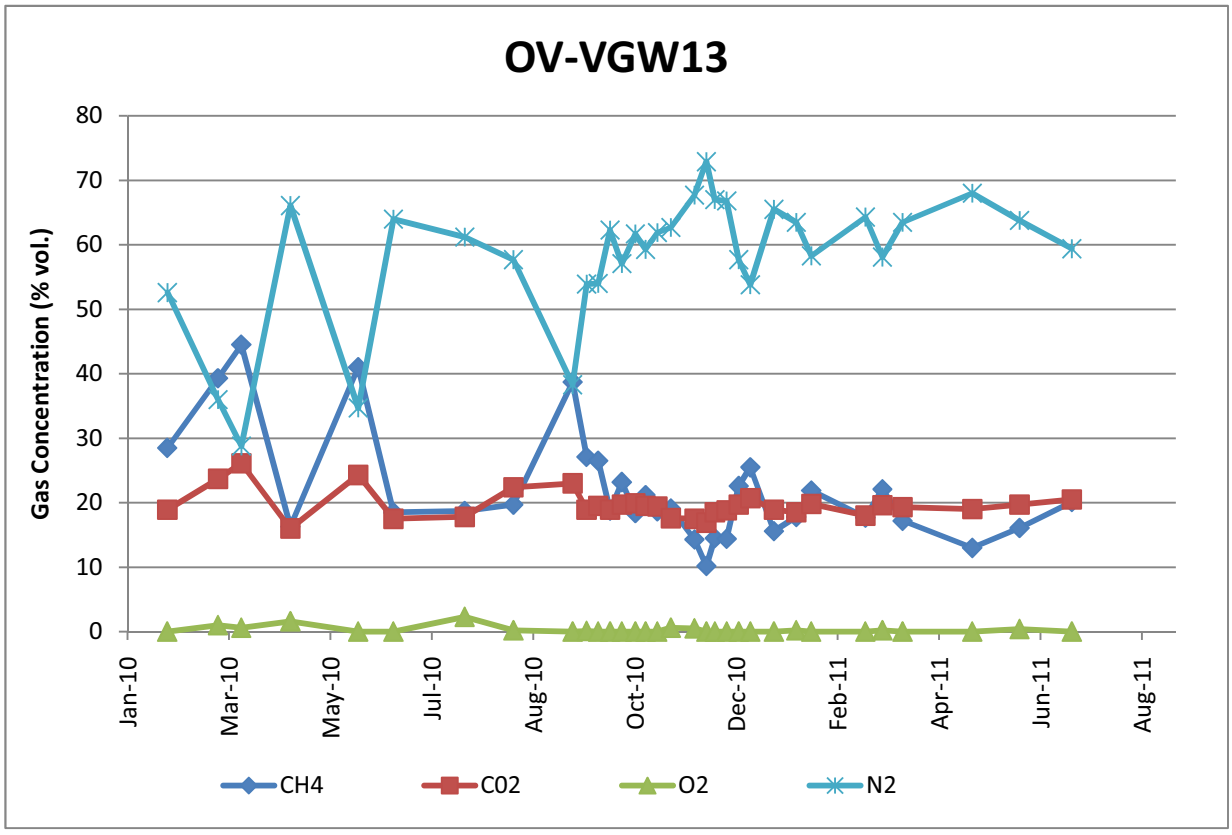

Temperature and Flow (°F and scfm)
Static Pressure (inches Water Column)
140
120
100
80
60
40
20
0
10
0
-10
-20
-30
-40
-50
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
Temperature
Flow
Static Pressure

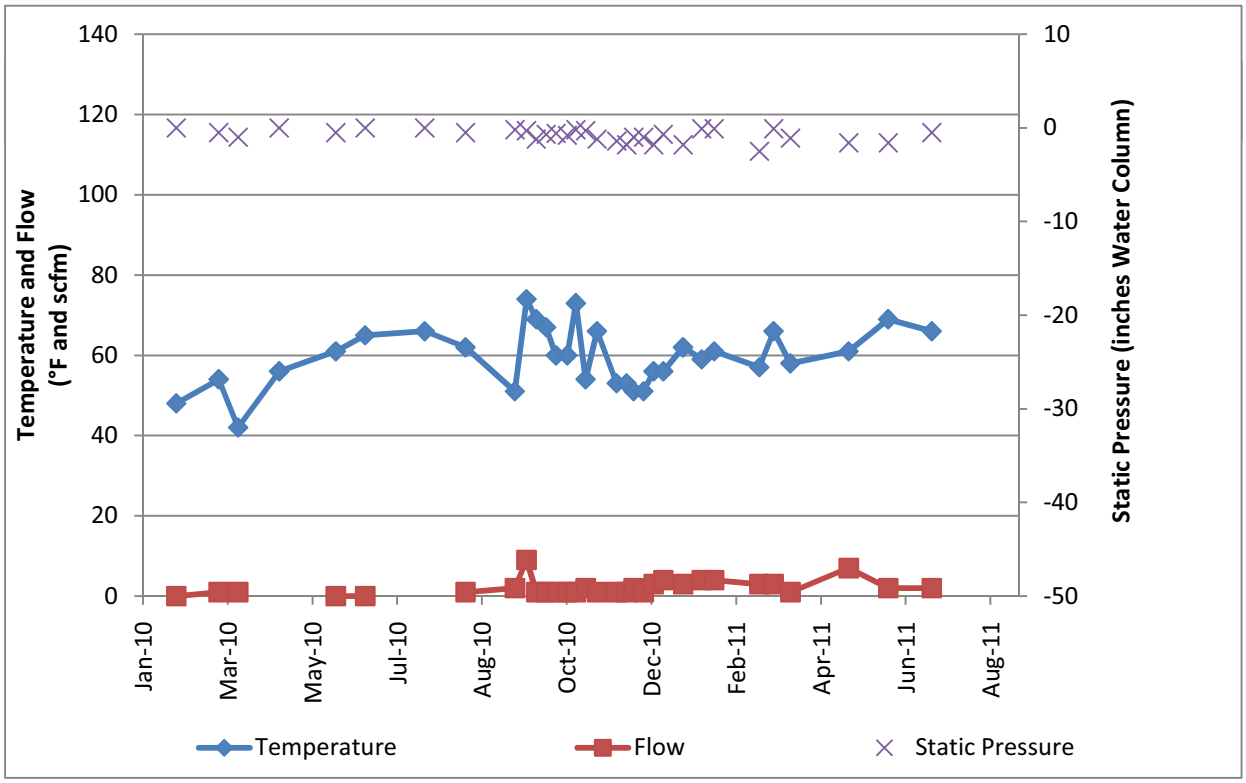

OV-VGW11
Gas Concentration (% vol.)
80
70
60
50
40
30
20
10
0
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2

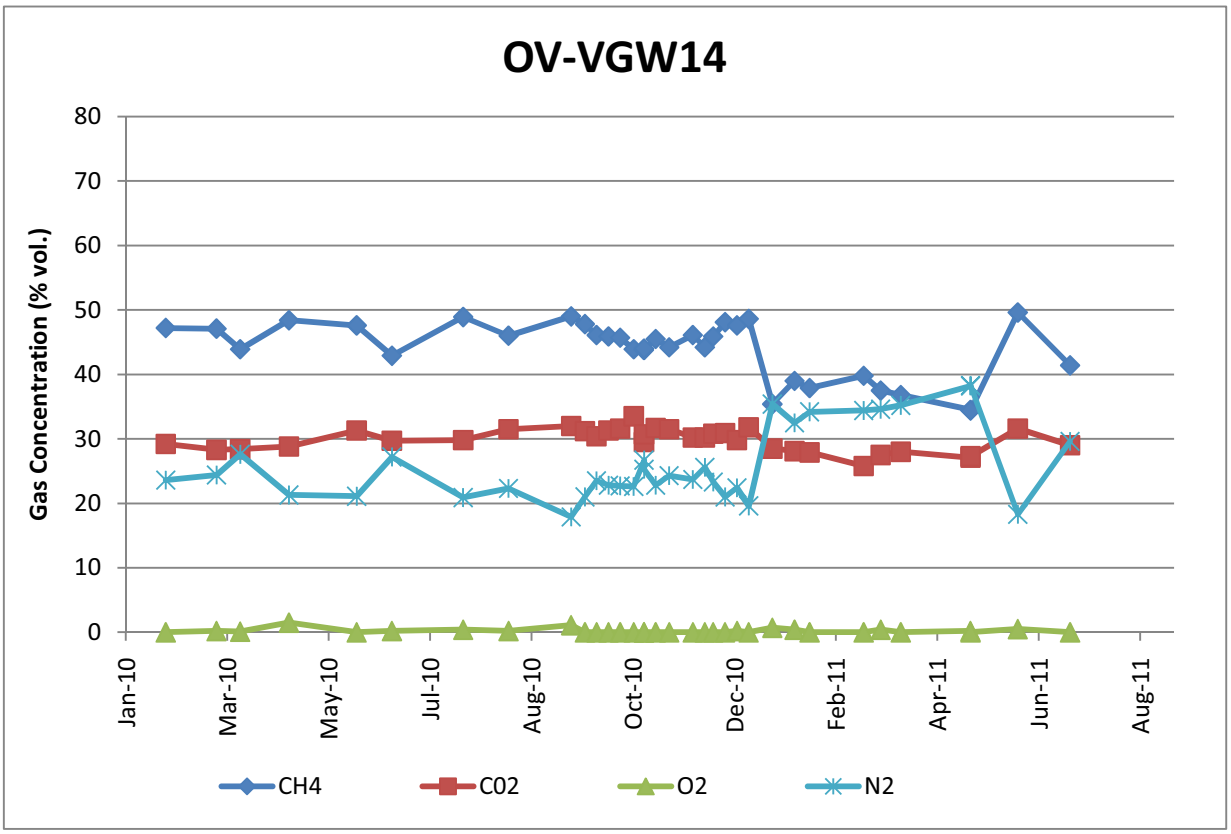

Temperature and Flow (°F and scfm)
140
120
100
80
60
40
20
0
10
0
-10
-20
-30
-40
-50
Static Pressure (inches Water Column)
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
Temperature
Flow
Static Pressure

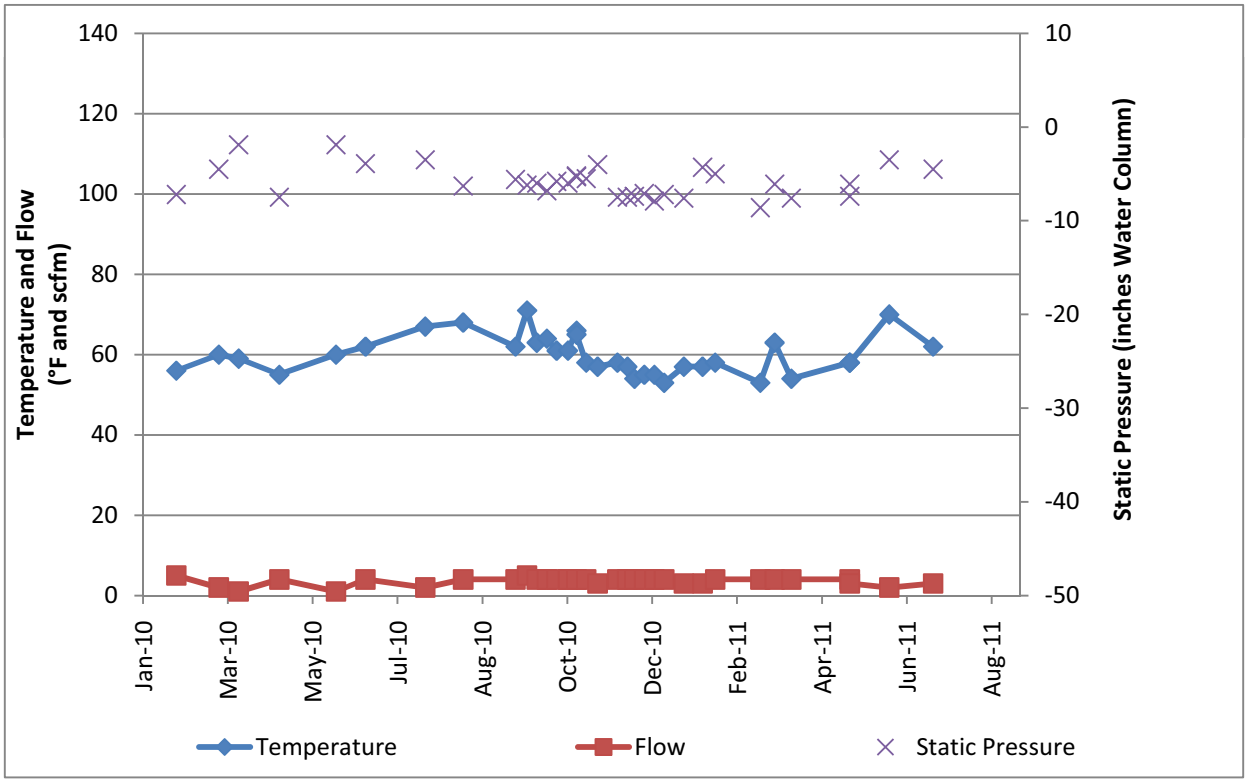

OV-VGW12
Gas Concentration (% vol.)
80
70
60
50
40
30
20
10
0
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2

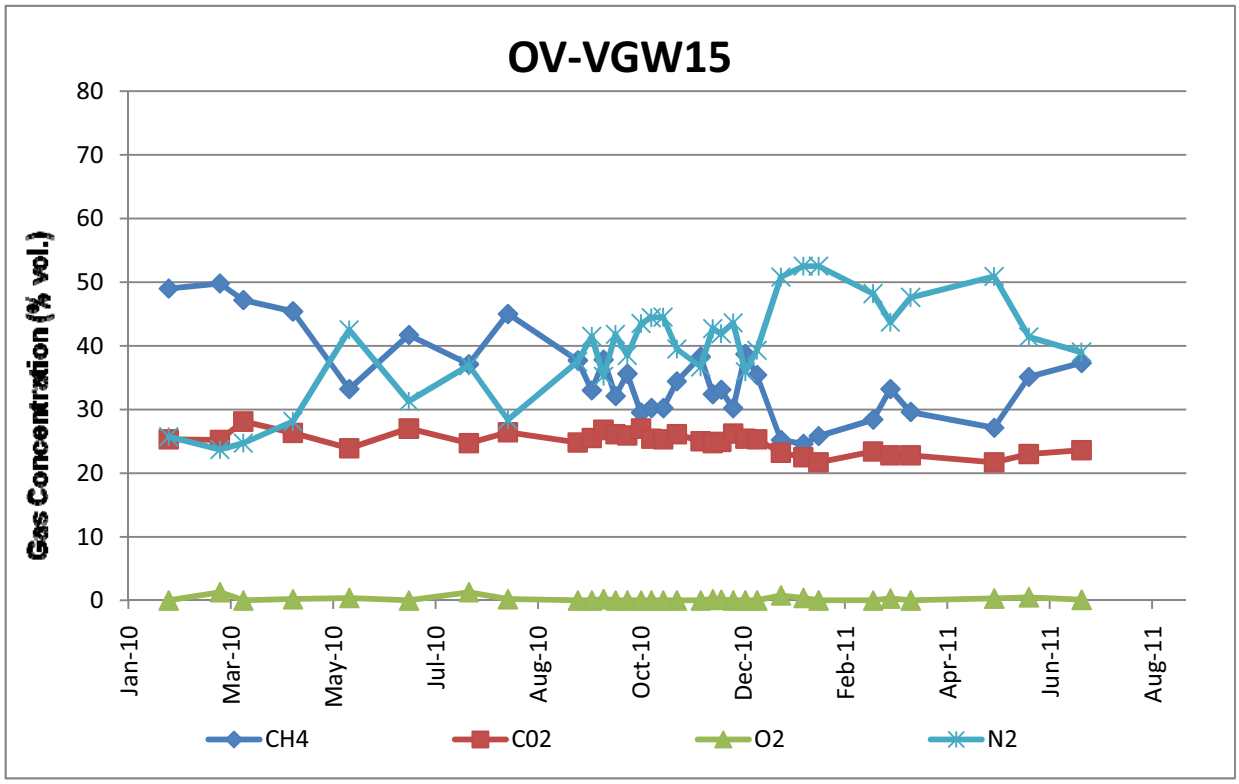

Temperature and Flow (°F and scfm)
140
120
100
80
60
40
20
0
10
0
-10
-20
-30
-40
-50
Static Pressure (inches Water Column)
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
Temperature
Flow
Static Pressure

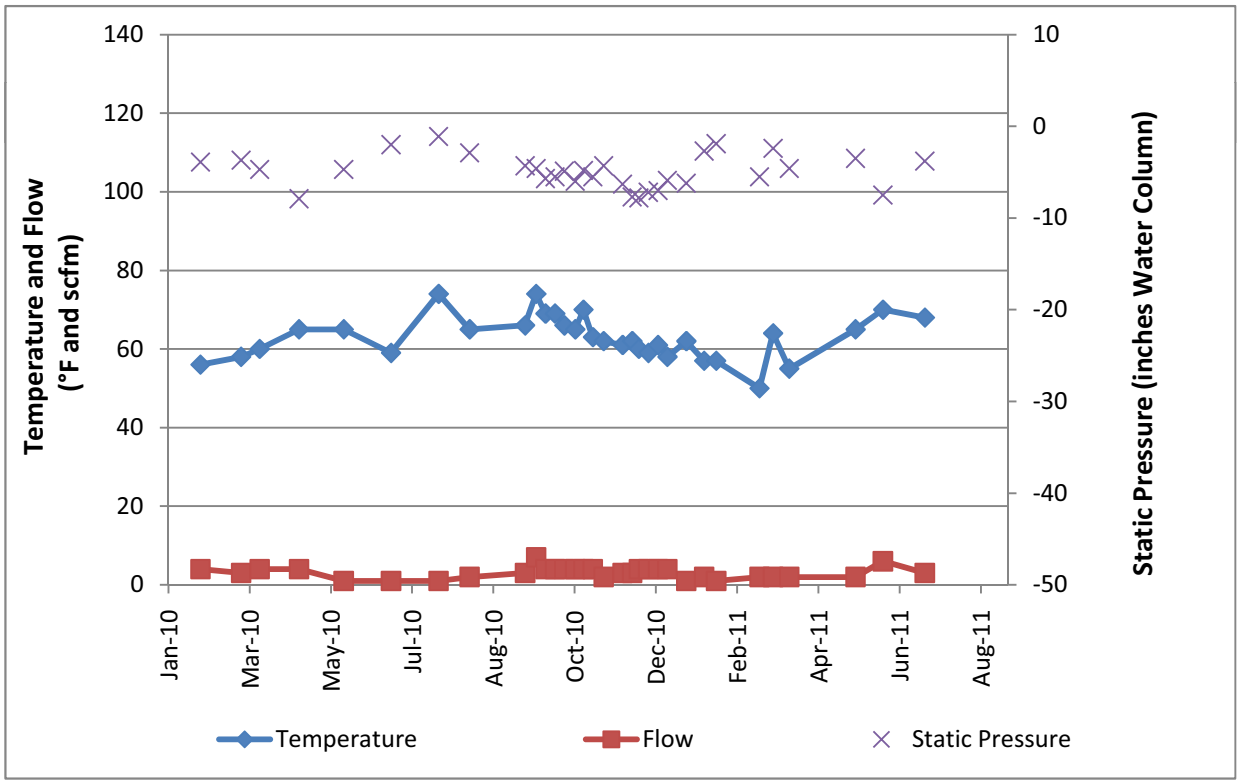

OV-VGW13
Gas Concentration (% vol.)
80
70
60
50
40
30
20
10
0
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2

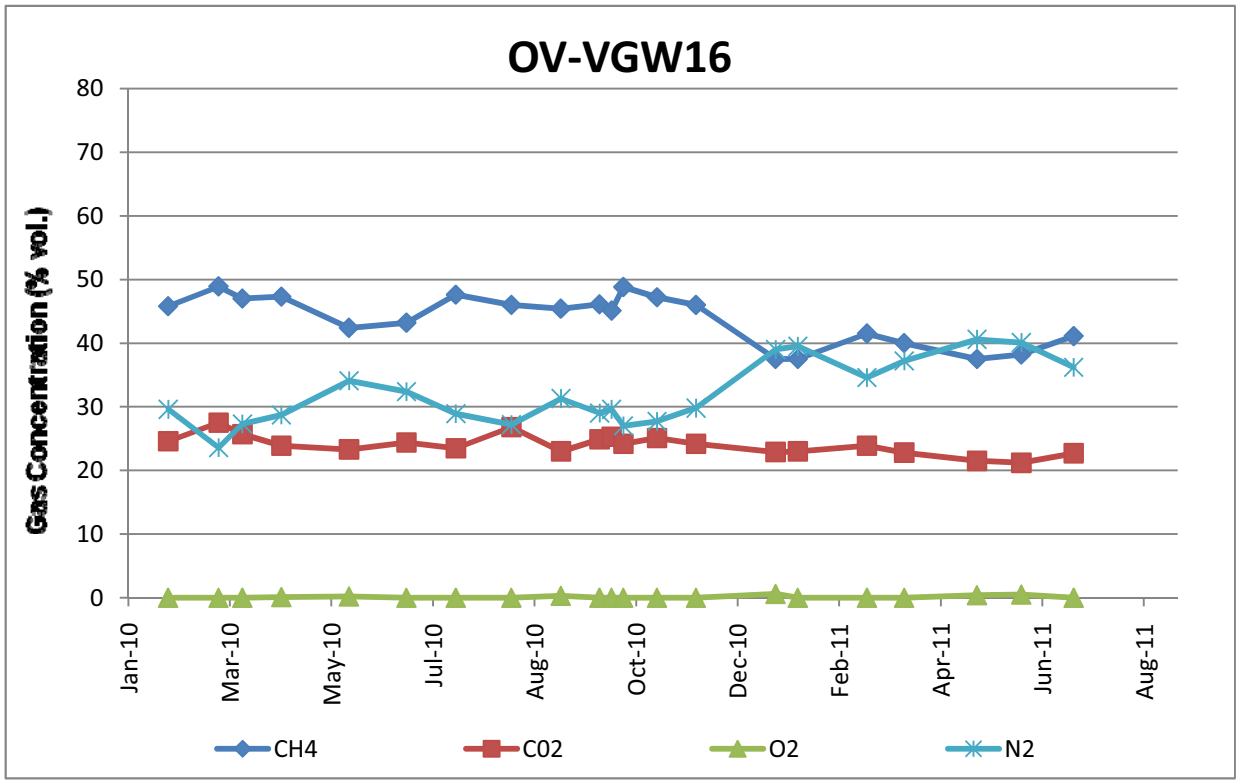

Temperature and Flow (°F and scfm)
140
120
100
80
60
40
20
0
10
0
-10
-20
-30
-40
-50
Static Pressure (inches Water Column)
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
Temperature
Flow
Static Pressure

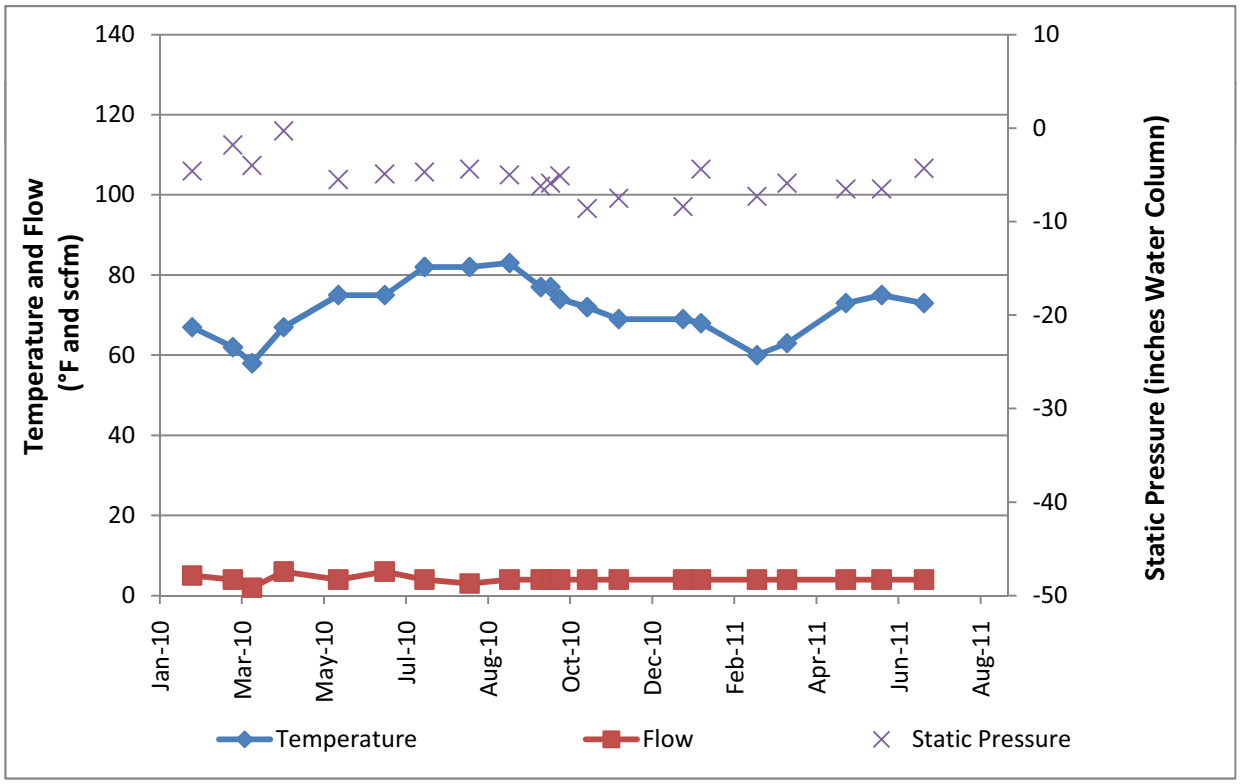

OV-VGW14
Gas Concentration (% vol.)
80
70
60
50
40
30
20
10
0
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2


Temperature and Flow (°F and scfm)
Static Pressure (inches Water Column)
140
120
100
80
60
40
20
0
10
0
-10
-20
-30
-40
-50
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
Temperature
Flow
Static Pressure


OV-VGW15
Gas Concentration (% vol.)
80
70
60
50
40
30
20
10
0
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2

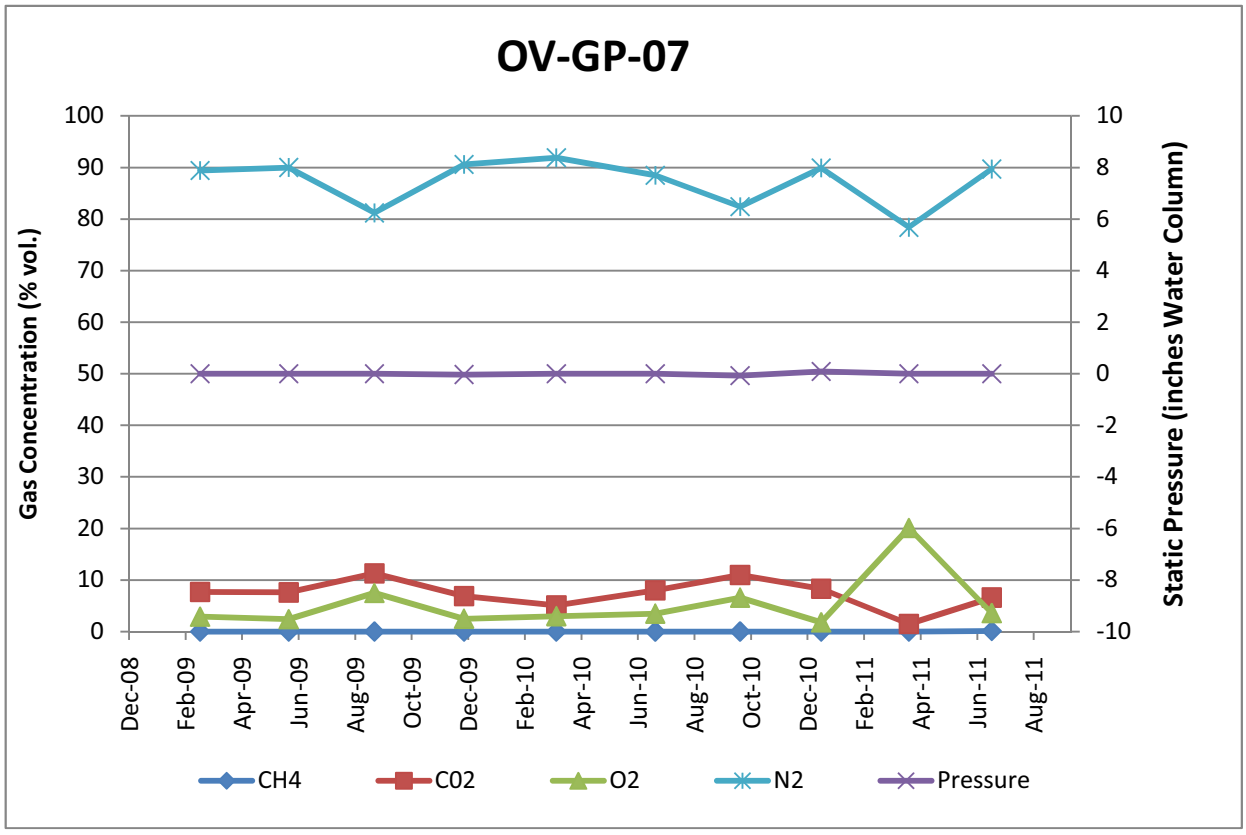

Temperature and Flow (°F and scfm)
140
120
100
80
60
40
20
0
10
0
-10
-20
-30
-40
-50
Static Pressure (inches Water Column)
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
Temperature
Flow
Static Pressure

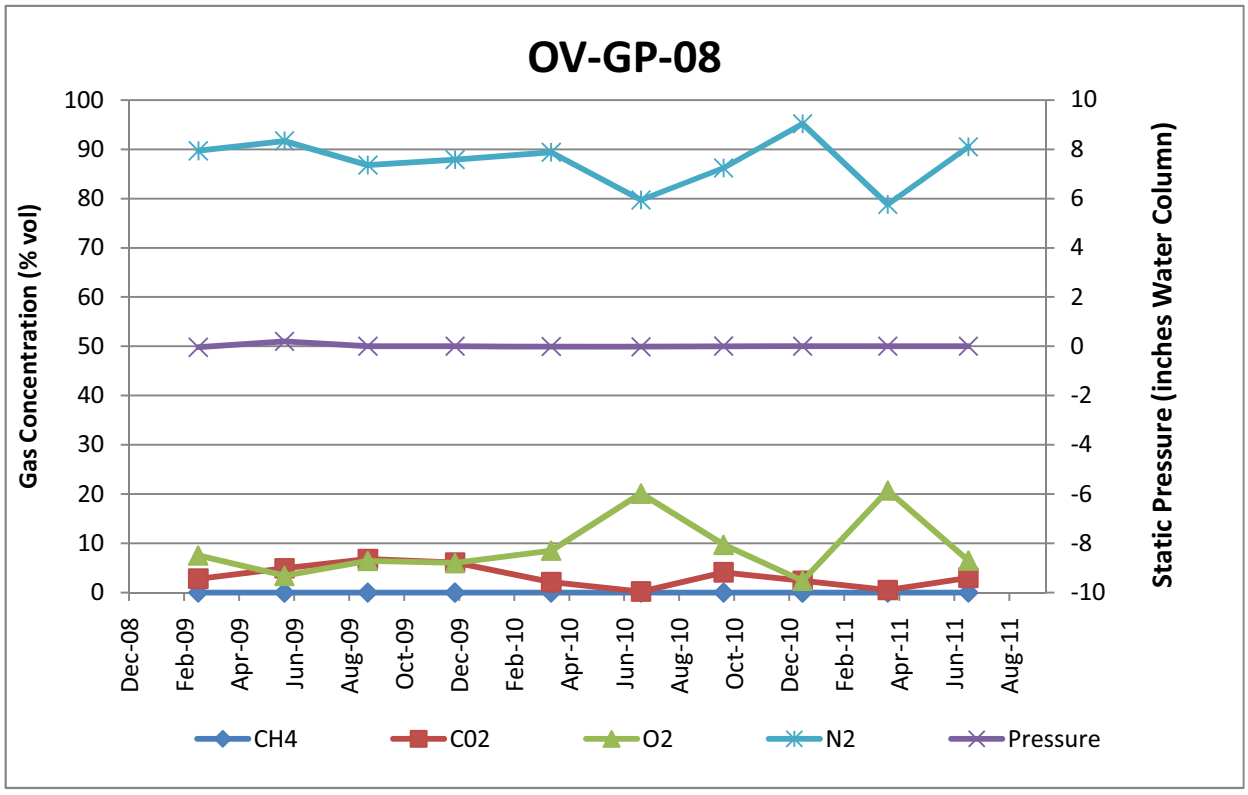

OV-VGW16
Gas Concentration (% vol.)
80
70
60
50
40
30
20
10
0
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2

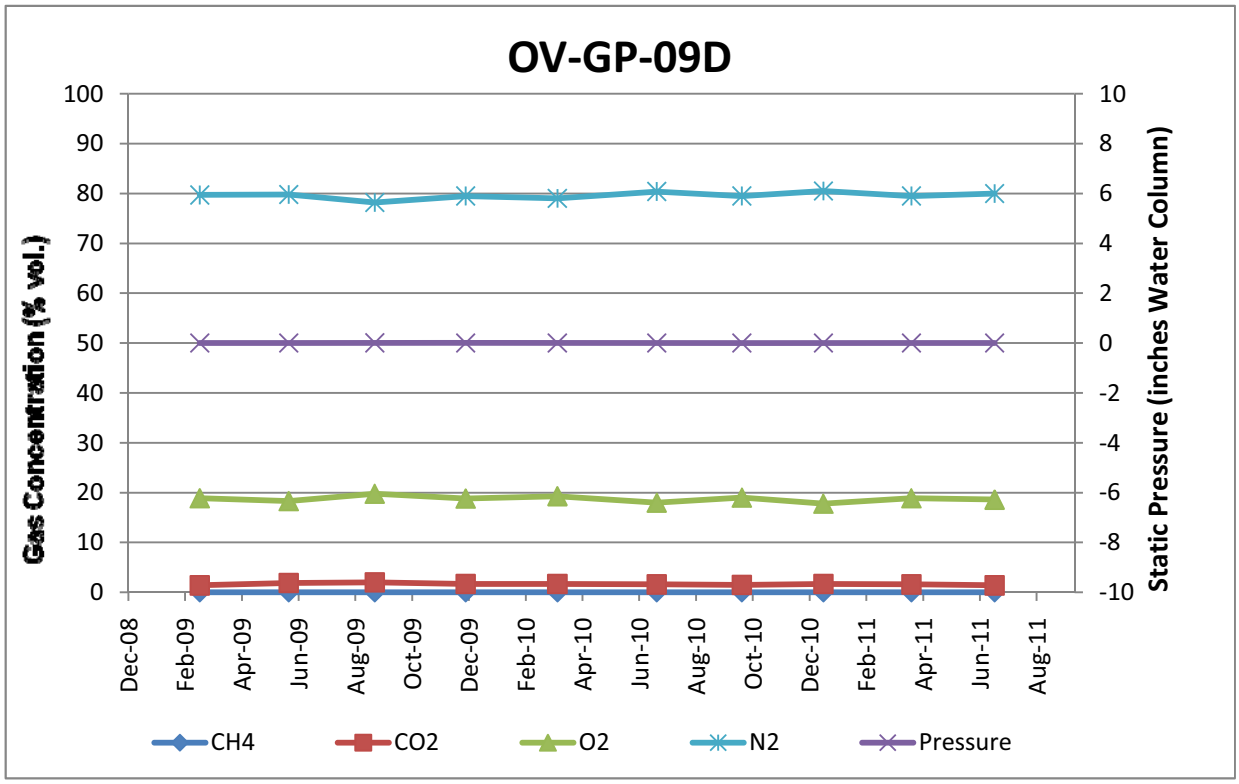

Temperature and Flow (°F and scfm)
140
120
100
80
60
40
20
0
10
0
-10
-20
-30
-40
-50
Static Pressure (inches Water Column)
Jan-10
Mar-10
May-10
Jul-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
Temperature
Flow
Static Pressure

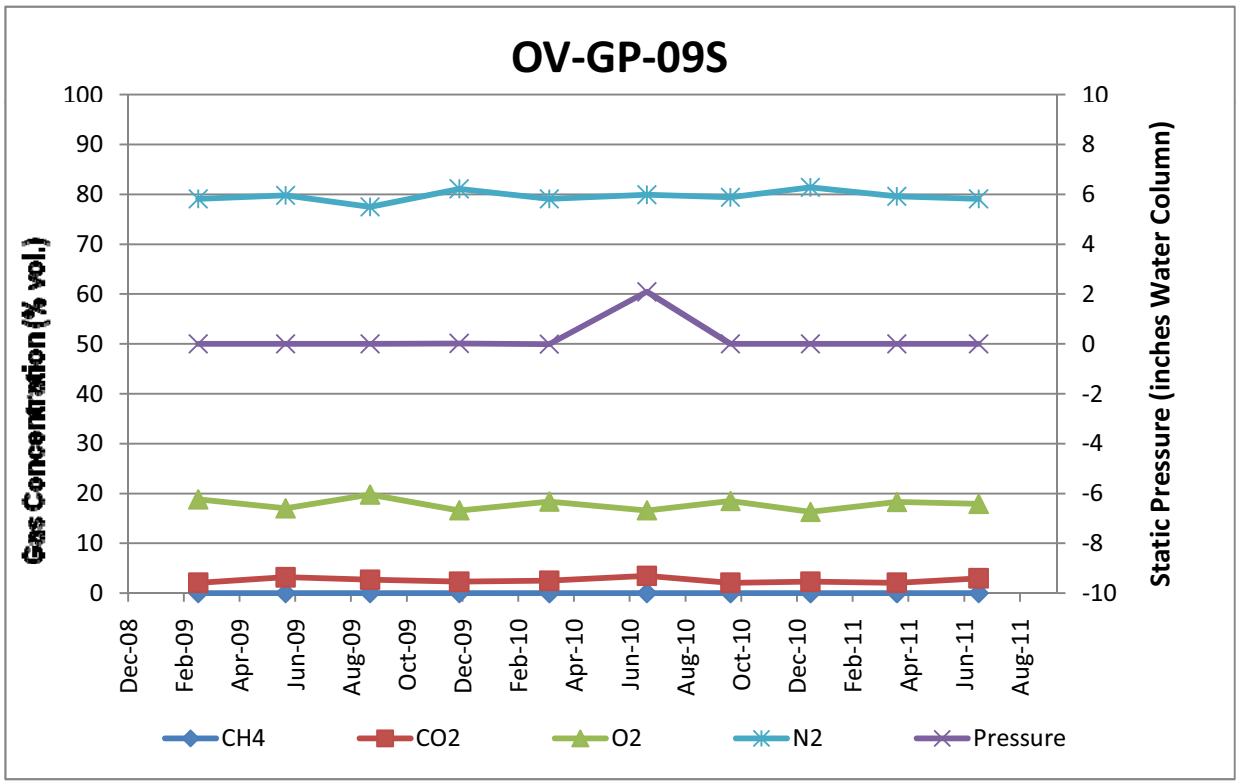
Attachment C

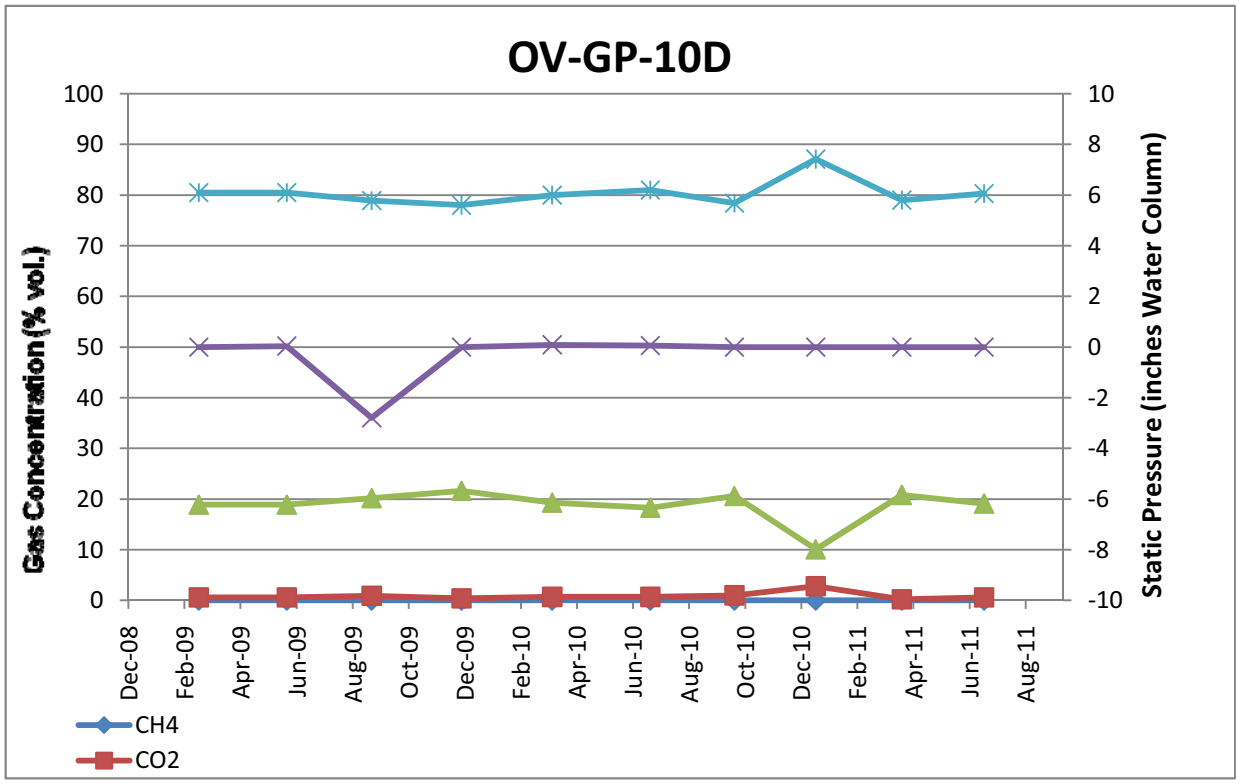
Historical Gas Probe Monitoring Results

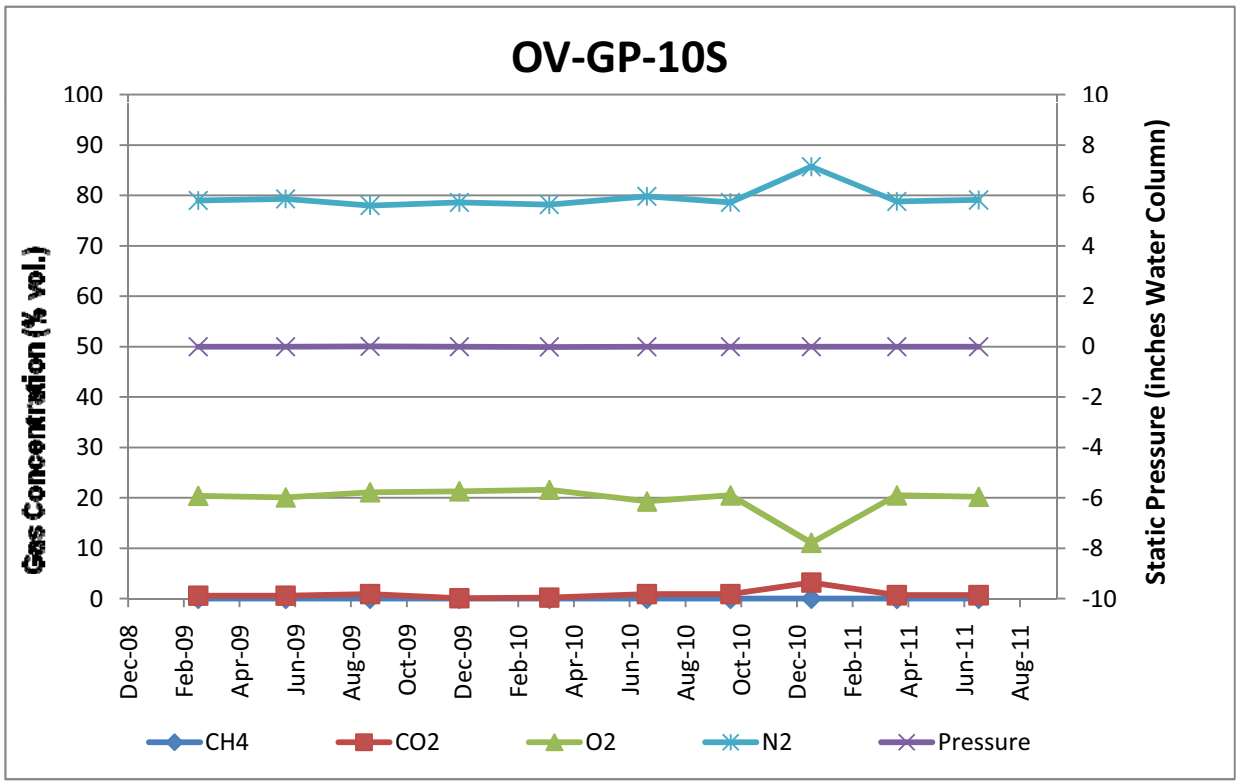

OV-GP-07
Gas Concentration (% vol.)
Static Pressure (inches Water Column)
100
90
80
70
60
50
40
30
20
10
0
10
8
6
4
2
0
-2
-4
-6
-8
-10
Dec-08
Feb-09
Apr-09
Jun-09
Aug-09
Oct-09
Dec-09
Feb-10
Apr-10
Jun-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2
Pressure

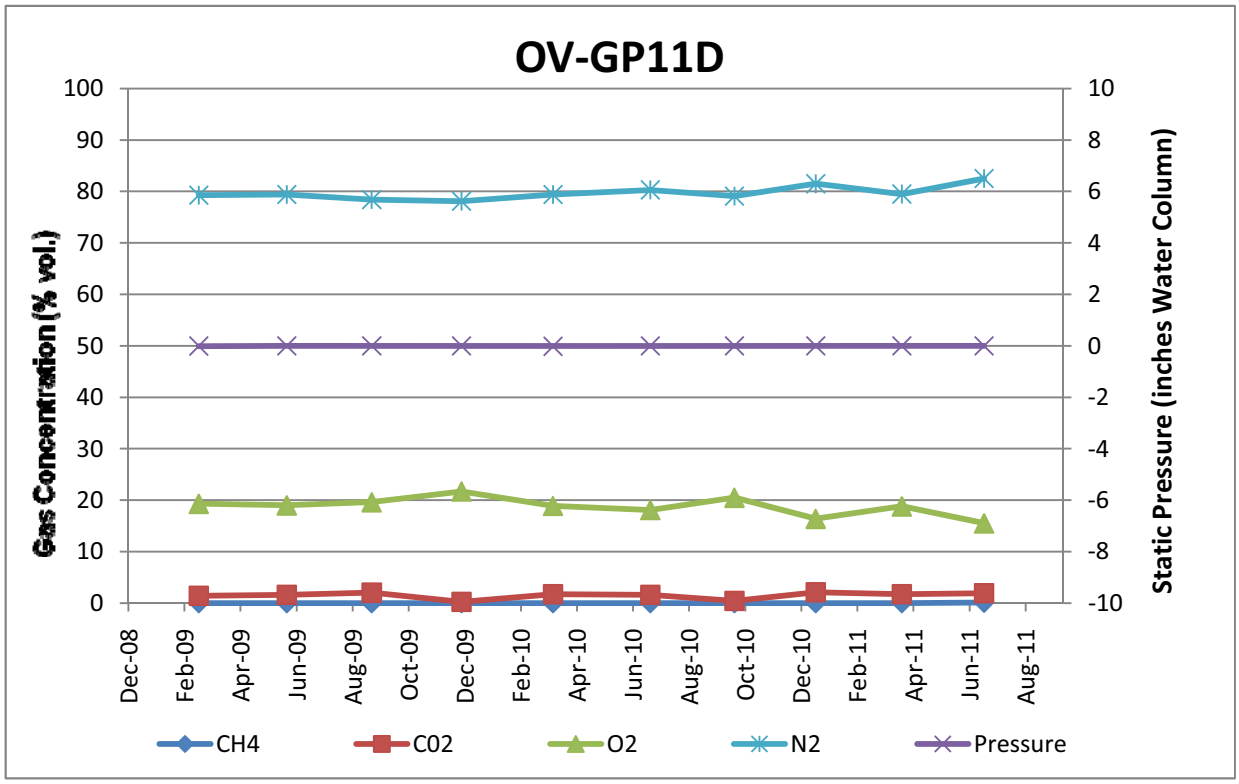

OV-GP-08
Gas Concentration (% vol)
Static Pressure (inches Water Column)
100
90
80
70
60
50
40
30
20
10
0
10
8
6
4
2
0
-2
-4
-6
-8
-10
Dec-08
Feb-09
Apr-09
Jun-09
Aug-09
Oct-09
Dec-09
Feb-10
Apr-10
Jun-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2
Pressure

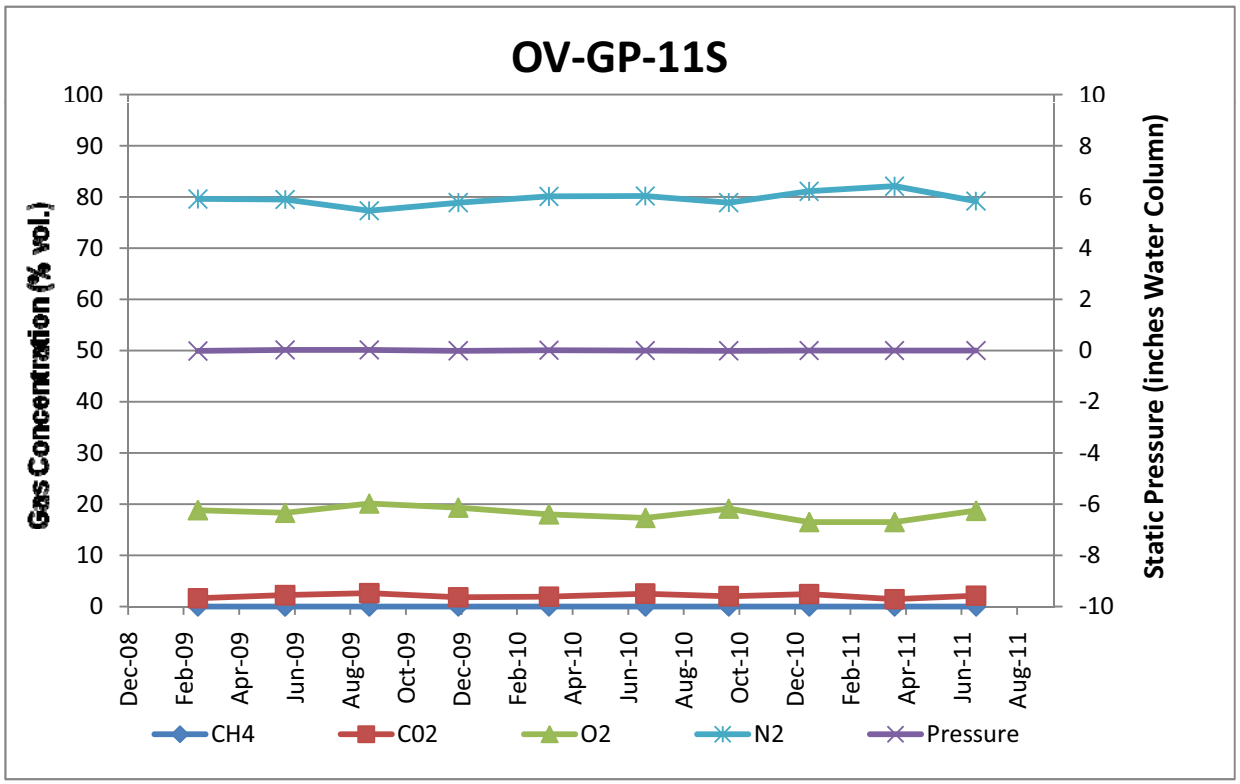

OV-GP-09D
Gas Concentration (% vol.)
Static Pressure (inches Water Column)
100
90
80
70
60
50
40
30
20
10
0
10
8
6
4
2
0
-2
-4
-6
-8
-10
Dec-08
Feb-09
Apr-09
Jun-09
Aug-09
Oct-09
Dec-09
Feb-10
Apr-10
Jun-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
CO2
O2
N2
Pressure

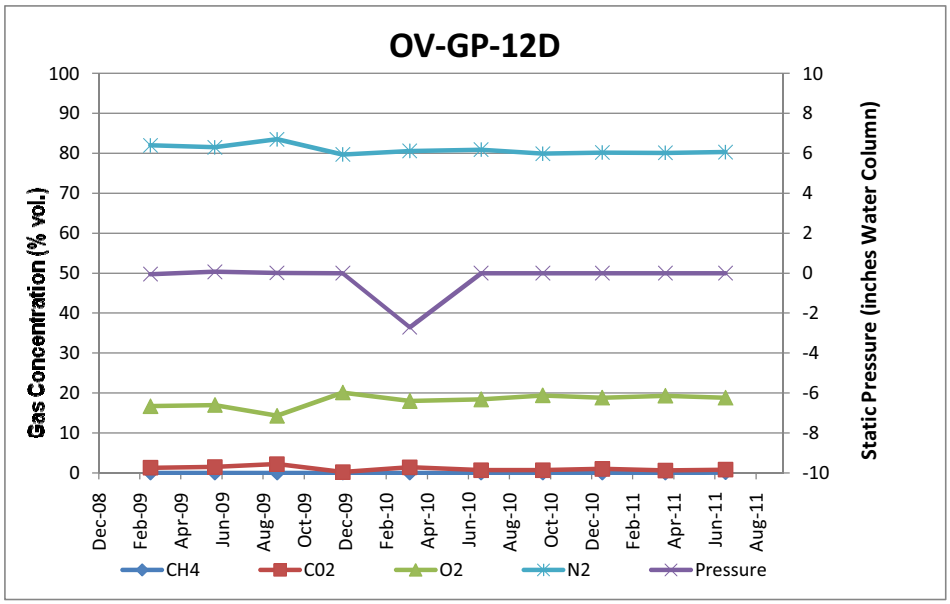

OV-GP-09S
Gas Concentration (% vol.)
Static Pressure (inches Water Column)
100
90
80
70
60
50
40
30
20
10
0
10
8
6
4
2
0
-2
-4
-6
-8
-10
Dec-08
Feb-09
Apr-09
Jun-09
Aug-09
Oct-09
Dec-09
Feb-10
Apr-10
Jun-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
CO2
O2
N2
Pressure

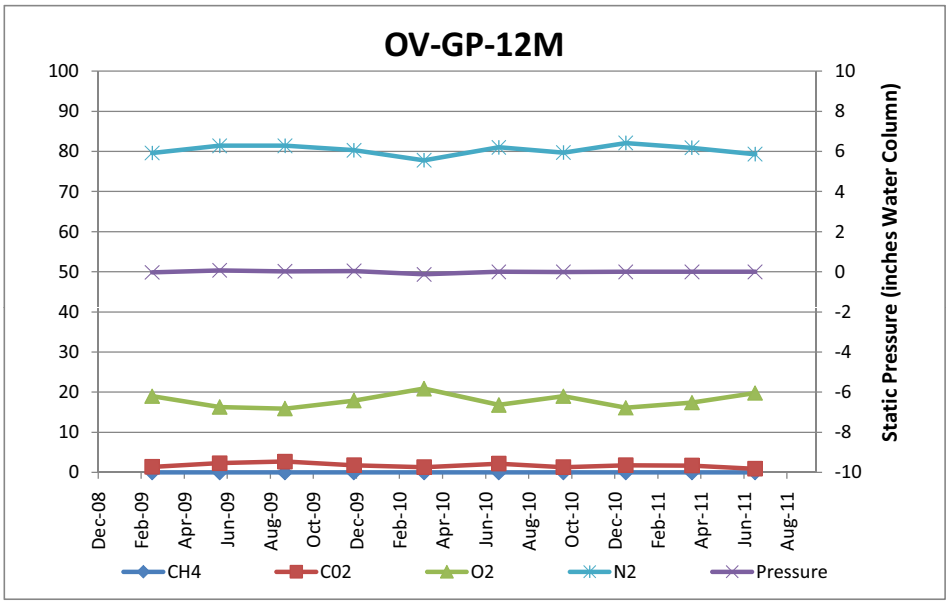

OV-GP-10D
Gas Concentration (% vol.)
Static Pressure (inches Water Column)
100
90
80
70
60
50
40
30
20
10
0
10
8
6
4
2
0
-2
-4
-6
-8
-10
Dec-08
Feb-09
Apr-09
Jun-09
Aug-09
Oct-09
Dec-09
Feb-10
Apr-10
Jun-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
CO2

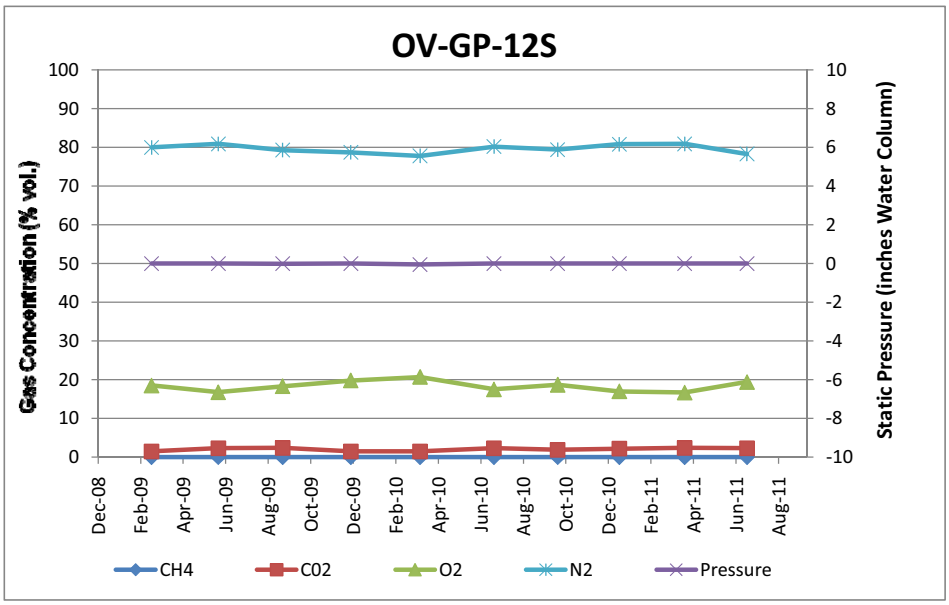

OV-GP-10S
Gas Concentration (% vol.)
Static Pressure (inches Water Column)
100
90
80
70
60
50
40
30
20
10
0
10
8
6
4
2
0
-2
-4
-6
-8
-10
Dec-08
Feb-09
Apr-09
Jun-09
Aug-09
Oct-09
Dec-09
Feb-10
Apr-10
Jun-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
CO2
O2
N2
Pressure

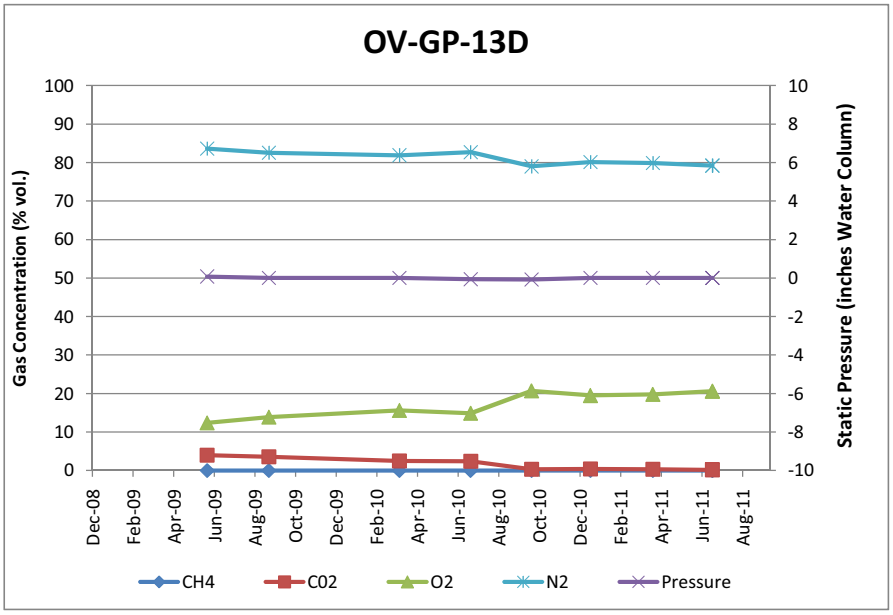

OV-GP11D
Gas Concentration (% vol.)
Static Pressure (inches Water Column)
100
90
80
70
60
50
40
30
20
10
0
10
8
6
4
2
0
-2
-4
-6
-8
-10
Dec-08
Feb-09
Apr-09
Jun-09
Aug-09
Oct-09
Dec-09
Feb-10
Apr-10
Jun-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2
Pressure

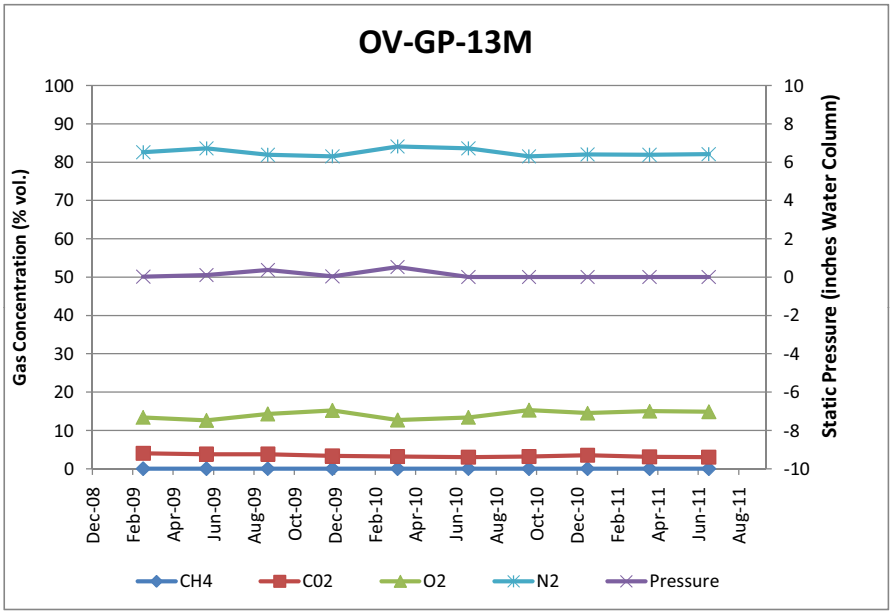

OV-GP-11S
Gas Concentration (% vol.)
Static Pressure (inches Water Column)
100
90
80
70
60
50
40
30
20
10
0
10
8
6
4
2
0
-2
-4
-6
-8
-10
Dec-08
Feb-09
Apr-09
Jun-09
Aug-09
Oct-09
Dec-09
Feb-10
Apr-10
Jun-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2
Pressure

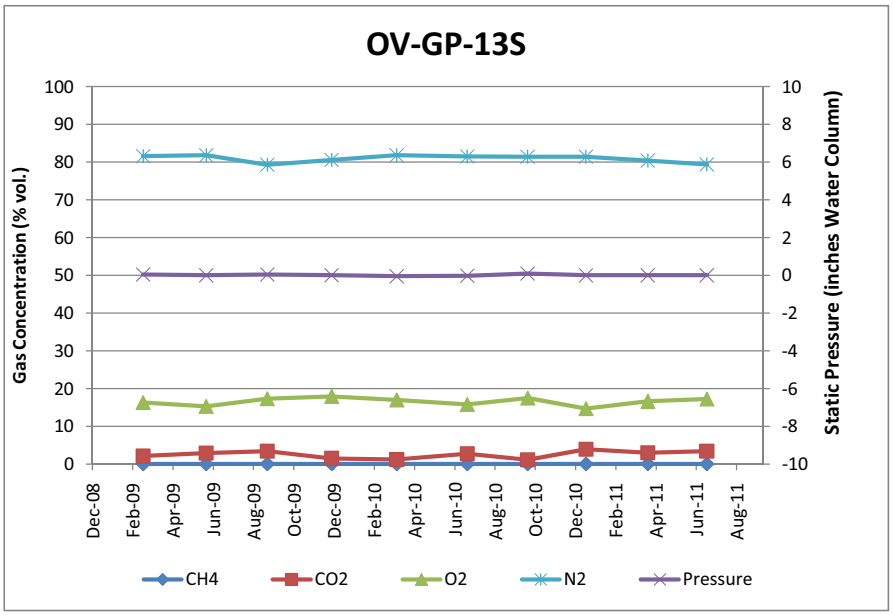

OV-GP-12D
Gas Concentration (% vol.)
Static Pressure (inches Water Column)
100
90
80
70
60
50
40
30
20
10
0
10
8
6
4
2
0
-2
-4
-6
-8
-10
Dec-08
Feb-09
Apr-09
Jun-09
Aug-09
Oct-09
Dec-09
Feb-10
Apr-10
Jun-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2
Pressure

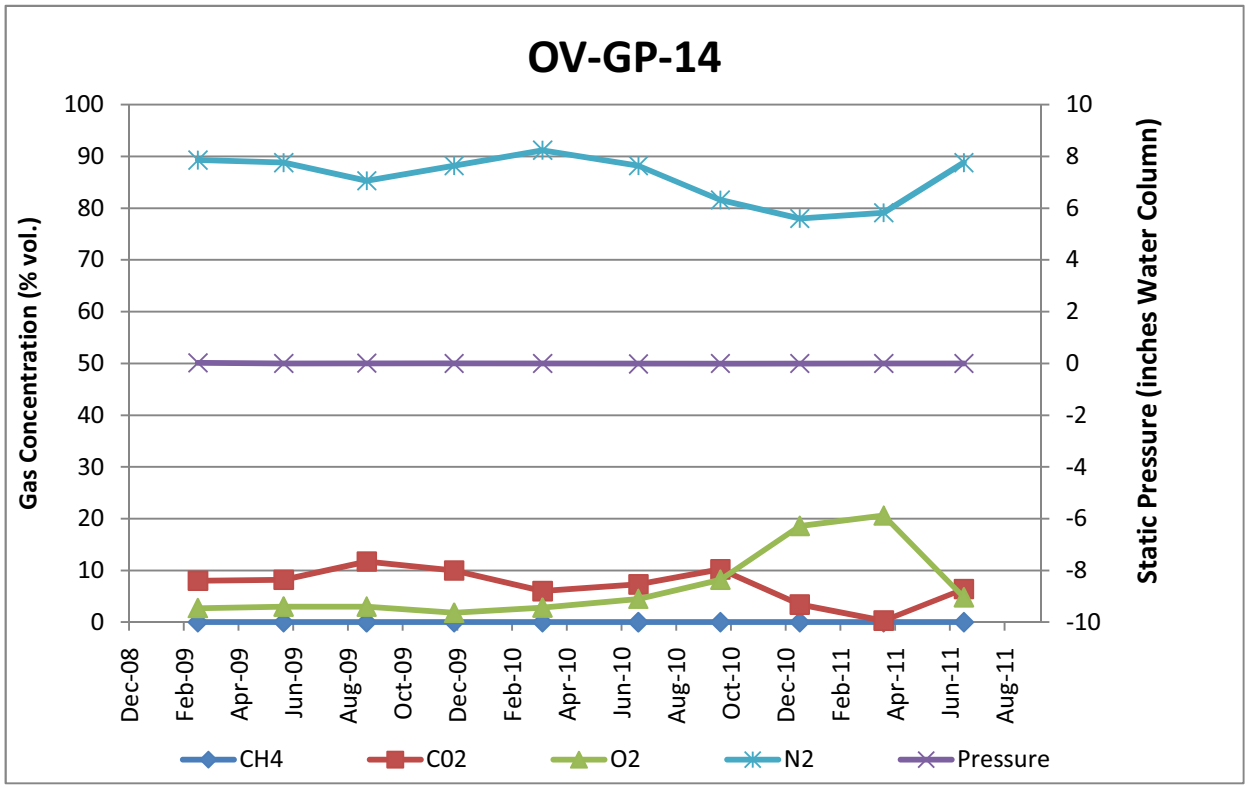

OV-GP-12M
Static Pressure (inches Water Column)
100
90
80
70
60
50
40
30
20
10
0
10
8
6
4
2
0
-2
-4
-6
-8
-10
Dec-08
Feb-09
Apr-09
Jun-09
Aug-09
Oct-09
Dec-09
Feb-10
Apr-10
Jun-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2
Pressure

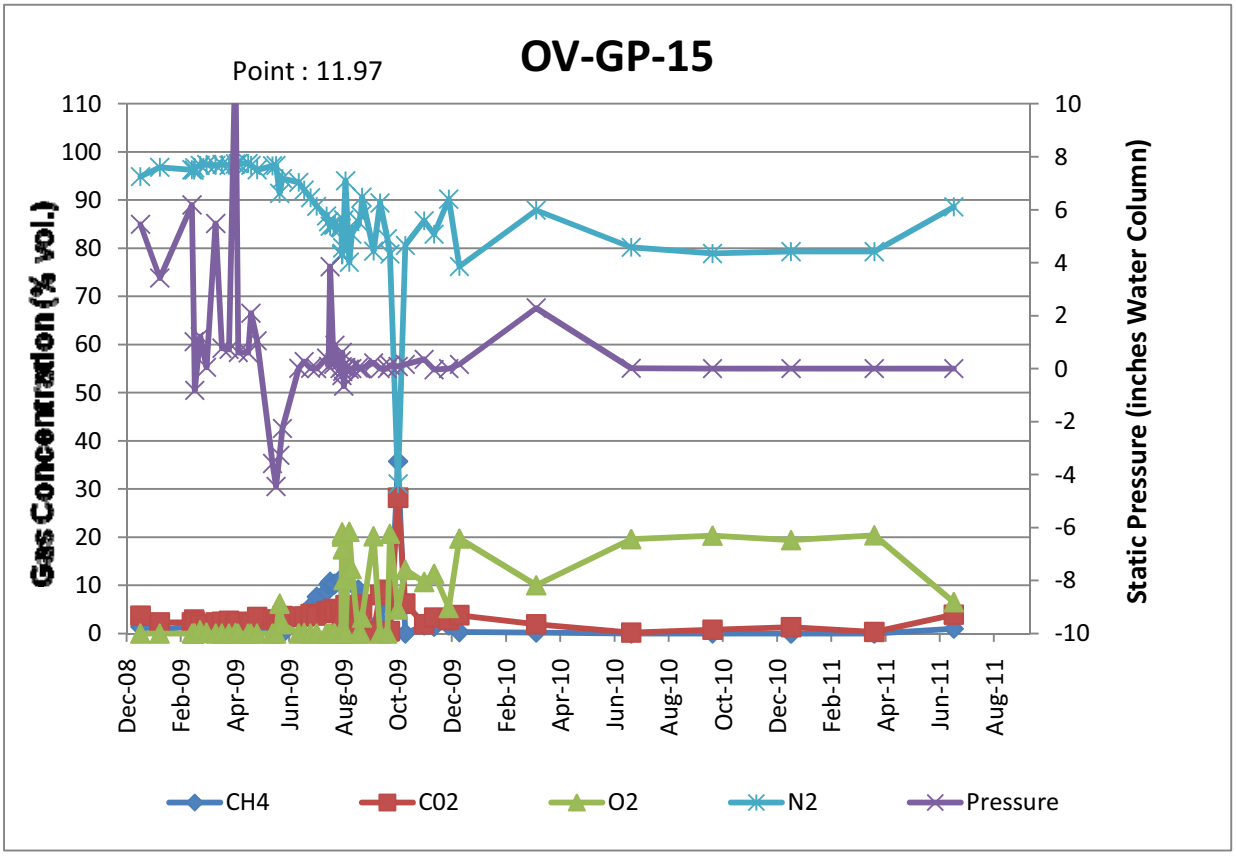

OV-GP-12S
Gas Concentration (% vol.)
Static Pressure (inches Water Column)
100
90
80
70
60
50
40
30
20
10
0
10
8
6
4
2
0
-2
-4
-6
-8
-10
Dec-08
Feb-09
Apr-09
Jun-09
Aug-09
Oct-09
Dec-09
Feb-10
Apr-10
Jun-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2
Pressure

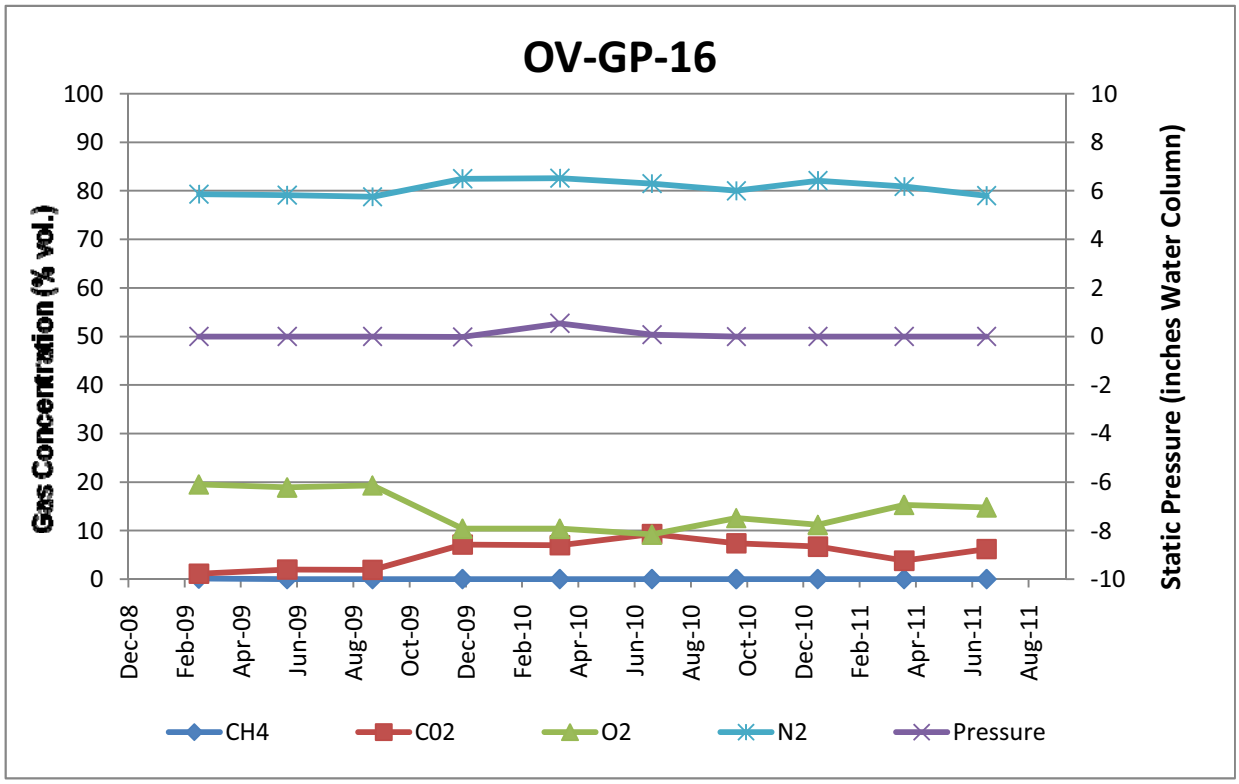

OV-GP-13D
Gas Concentration (% vol.)
Static Pressure (inches Water Column)
100
90
80
70
60
50
40
30
20
10
0
10
8
6
4
2
0
-2
-4
-6
-8
-10
Dec-08
Feb-09
Apr-09
Jun-09
Aug-09
Oct-09
Dec-09
Feb-10
Apr-10
Jun-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2
Pressure


OV-GP-13M
Gas Concentration (% vol.)
Static Pressure (inches Water Column)
100
90
80
70
60
50
40
30
20
10
0
10
8
6
4
2
0
-2
-4
-6
-8
-10
Dec-08
Feb-09
Apr-09
Jun-09
Aug-09
Oct-09
Dec-09
Feb-10
Apr-10
Jun-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2
Pressure


OV-GP-13S
Gas Concentration (% vol.)
Static Pressure (inches Water Column)
100
90
80
70
60
50
40
30
20
10
0
10
8
6
4
2
0
-2
-4
-6
-8
-10
Dec-08
Feb-09
Apr-09
Jun-09
Aug-09
Oct-09
Dec-09
Feb-10
Apr-10
Jun-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
CO2
O2
N2
Pressure

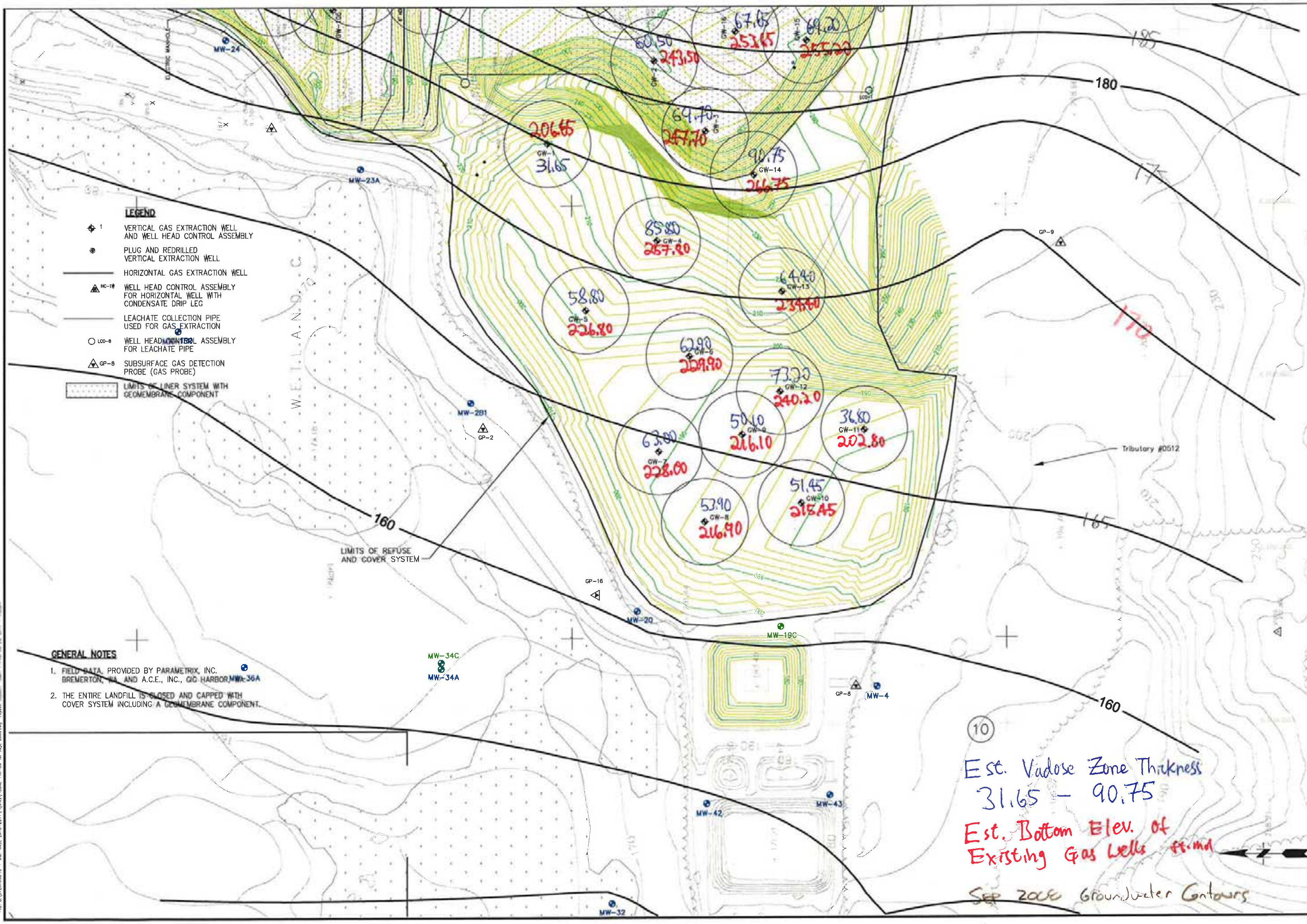

OV-GP-14
Gas Concentration (% vol.)
Static Pressure (inches Water Column)
100
90
80
70
60
50
40
30
20
10
0
10
8
6
4
2
0
-2
-4
-6
-8
-10
Dec-08
Feb-09
Apr-09
Jun-09
Aug-09
Oct-09
Dec-09
Feb-10
Apr-10
Jun-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2
Pressure


OV-GP-15
Point : 11.97
Gas Concentration (% vol.)
Static Pressure (inches Water Column)
110
100
90
80
70
60
50
40
30
20
10
0
10
8
6
4
2
0
-2
-4
-6
-8
-10
Dec-08
Feb-09
Apr-09
Jun-09
Aug-09
Oct-09
Dec-09
Feb-10
Apr-10
Jun-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2
Pressure


OV-GP-16
Gas Concentration (% vol.)
Static Pressure (inches Water Column)
100
90
80
70
60
50
40
30
20
10
0
10
8
6
4
2
0
-2
-4
-6
-8
-10
Dec-08
Feb-09
Apr-09
Jun-09
Aug-09
Oct-09
Dec-09
Feb-10
Apr-10
Jun-10
Aug-10
Oct-10
Dec-10
Feb-11
Apr-11
Jun-11
Aug-11
CH4
C02
O2
N2
Pressure

Attachment D

Vadose Zone Thickness Maps



SHEET TITLE: GAS EXTRACTION NETWORK OLD BARNEY WHITE LANDFILL (OBWL) AREA

PROJECT TITLE: LANDFILL GAS SYSTEM EVALUATION OLYMPIC VIEW LANDFILL

NO.	REVISION	DATE

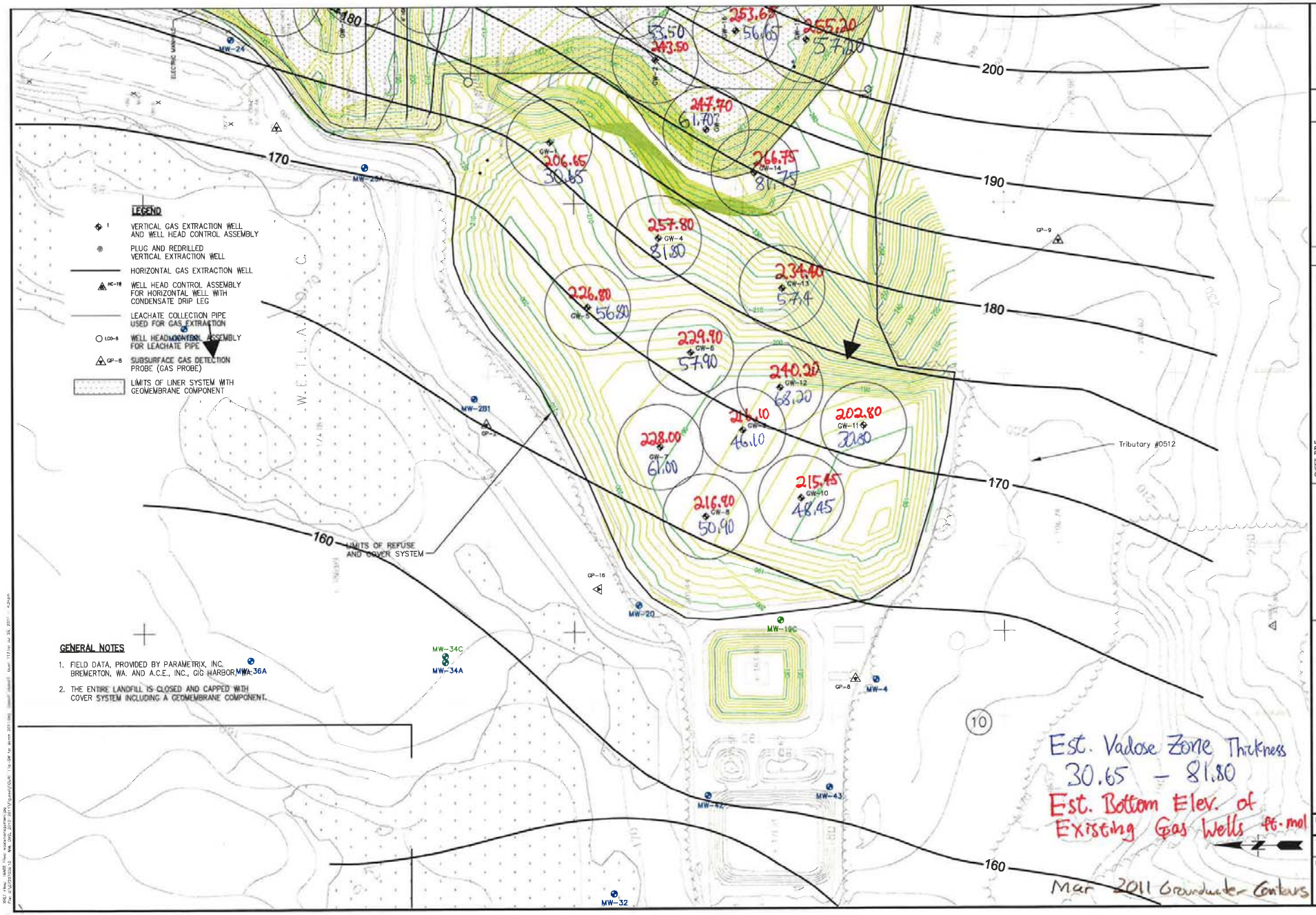
SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.

PROJ. NO. 07207006.10	DWN. BY: LEL	ACAD FILE: FIGURE 1
DSN. BY: TAM	CHK. BY: TAM	APP. BY: JMR

DATE: JUNE 2011

SCALE: AS SHOWN

FIGURE NO. 1



NO.	REVISION	DATE

SHEET TITLE: GAS EXTRACTION NETWORK
OLD BARNEY WHITE LANDFILL (OBWL) AREA

PROJECT TITLE
LANDFILL GAS SYSTEM EVALUATION
OLYMPIC VIEW LANDFILL

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS, INC.

PROJ. NO. 0720006.10 | DWN. BY: LEL | ACAD FILE: FIGURE 1 | CHK. BY: TAM | APP. BY: TAM | JMR

DATE: JUNE 2011

SCALE: AS SHOWN

FIGURE NO. 2

Water Level and DTW

GW	Elev	DTB	Depth	WL M11	DTW Mar11	WL S08	DTW Sep08	LF Bottom
1	245	38.35	206.65	176	30.65	175	31.65	210
2	290	46.5	243.5	190	53.5	183	60.5	220
3	305	57.3	247.7	186	61.7	178	69.7	226
4	310	52.2	257.8	176	81.8	172	85.8	217
5	255	28.2	226.8	170	56.8	168	58.8	202
6	288	58.1	229.9	172	57.9	167	62.9	195
7	257	29	228	167	61	165	63	190
8	247	30.1	216.9	166	50.9	163	53.9	187
9	281	64.9	216.1	170	46.1	166	50.1	188
10	245	29.55	215.45	167	48.45	164	51.45	181
11	232	29.2	202.8	172	30.8	166	36.8	182
12	280	39.8	240.2	172	68.2	167	73.2	188
13	293	58.6	234.4	177	57.4	170	64.4	217
14	310	43.25	266.75	185	81.75	176	90.75	266
15	305	49.8	255.2	198	57.2	186	69.2	232
16	318	64.35	253.65	197	56.65	186	67.65	226

Attachment E

Drawings

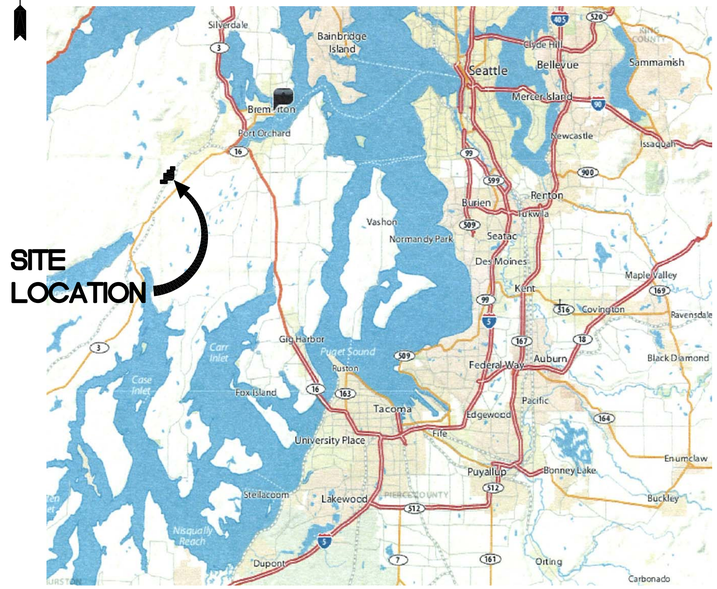
2011 GAS SYSTEM EXPANSION

LANDFILL GAS COLLECTION & CONTROL SYSTEM (GCCS)
OLYMPIC VIEW SANITARY LANDFILL

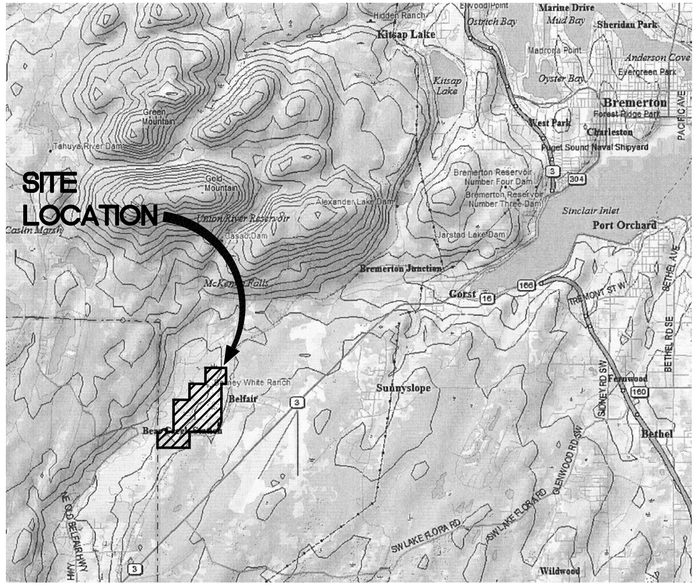
WASTE MANAGEMENT

NOT FOR CONSTRUCTION
REVIEW SUBMITTAL

LOCATION MAP



VICINITY MAP



DRAWING INDEX

NO.	REVISION	DATE
A	ISSUED FOR CLIENT REVIEW	7/27/11
B	ISSUED FOR CLIENT REVIEW	8/3/11

SHEET TITLE: COVER SHEET

PROJECT TITLE: 2011 GAS SYSTEM EXPANSION
LANDFILL GAS COLLECTION & CONTROL SYSTEM (GCCS)
OLYMPIC VIEW SANITARY LANDFILL

OLYMPIC VIEW SANITARY LANDFILL, INC.

SCS ENGINEERS
Environmental Consultants and Contractors
2405 140th Avenue NE, Suite 107
Bellevue, Washington 98005
(425) 746-4600 FAX: (425) 746-6747

PROJ. NO.	07207006.10
DSN. BY:	TAM
DWN. BY:	LEL
CHK. BY:	EMS
ACAD FILE:	G1
APP. BY:	JMR

DATE: JULY 2011

SCALE: AS SHOWN

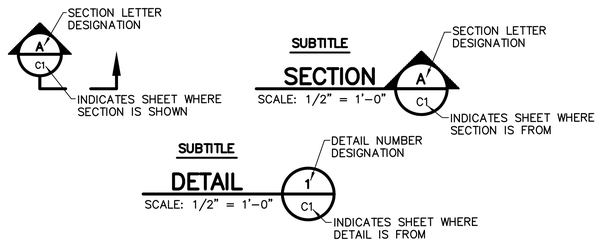
DRAWING NO. G1

TOPOGRAPHIC SYMBOLS

PROPOSED	EXISTING	
		CENTERLINE
		GRAVEL ROAD
		PAVED ROAD
		DITCH
		APPROXIMATE LIMITS OF DENSE TREES
		PROPERTY LINE
		CULVERT
		FENCE
		POWER LINE / POLE
250	250	CONTOUR ELEVATION
	20 201.67	CONTROL POINT WITH NUMBER / ELEVATION
		SITE COORDINATE GRID MARK
		SECTION CORNER (ASSUMED – NOT FOUND)
		QUARTER SECTION CORNER (ASSUMED – NOT FOUND)
	(10)	SECTION CENTER (ASSUMED – NOT FOUND)
		YARD LIGHT
HGC–R		HORIZONTAL GAS COLLECTOR
	M–5	MANIFOLD CONNECTION ON HEADER PIPE
	MH–2	MANHOLE MH–2
	MW–20	GROUNDWATER MONITORING WELL
GW–112	GW–1	VERTICAL GAS EXTRACTION WELL AND WELL HEAD CONTROL ASSEMBLY
	GP–1	ABANDON GAS PROBE
	GP–2	GAS PROBE (NOT PART OF MONITORING PROGRAM)
	GP–16	SUBSURFACE GAS DETECTION PROBE (GAS PROBE)
	CS–2 OR CS–6	CONDENSATE PUMP STATION
	LCO–1	LEACHATE CLEANOUT ACCESS PORT
	LR–2	LEACHATE SUMP RISER PIPE
		REMOTE WELL HEAD CONTROL ASSEMBLY
	STA 11+00	1100 FT

GEOSYNTHETIC SYMBOLS

	GEOMEMBRANE
	GEOTEXTILE



SECTION AND DETAIL DESIGNATIONS

SOIL/AGGREGATE SYMBOLS

	PREPARED SUBGRADE
	EXISTING GRADE
	BENTONITE
	FINE GRAINED SOIL OR FINAL BACKFILL
	FILTER PACK (ROUND ROCK) OR EMBEDMENT MATERIAL TYPE 1
	CLAY SOIL

PIPING SYMBOLS

4"ø–HDPE–LFG	PIPE LINE DESIGNATION SIZE–MATERIAL–SERVICE
	FLANGE CONNECTION
	PIPE CAP
	BLIND FLANGE
	ELBOW DOWN
	ELBOW UP
	BALL VALVE
	BUTTERFLY VALVE
	LINE SIZE REDUCER

ABBREVIATIONS

ASTM	AMERICAN SOCIETY FOR TESTING & MATERIALS
AWG	AMERICAN WIRE GAUGE
&	AND
℄	CENTERLINE
COND	CONDENSATE
DEG OR °	DEGREES
D, DIA OR Ø	DIAMETER
DIM	DIMENSION
DWG	DRAWING
E	EAST OR EASTING
EL OR ELEV	ELEVATION
FT OR '	FEET
FT–MSL	FEET–MEAN SEA LEVEL
GA	GAUGE
GALV	GALVANIZED
>	GREATER THAN
≥	GREATER THAN OR EQUAL TO
HDPE	HIGH DENSITY POLYETHYLENE
HORZ OR HORIZ	HORIZONTAL
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN OR "	INCH
LFG	LANDFILL GAS
LFGE	LANDFILL GAS TO ENERGY
<	LESS THAN
≤	LESS THAN OR EQUAL TO
MAX	MAXIMUM
MIL	1/1000
MIN	MINIMUM
MPT	MALE PIPE THREAD
N	NORTH OR NORTHING
NTS	NOT TO SCALE
NO. OR #	NUMBER
OBWL	OLD BARNEY WHITE LANDFILL
OC	ON CENTER
OD	OUTSIDE DIAMETER
OZ	OUNCE
%	PERCENT
PERF	PERFORATED
PVC	POLYVINYL CHLORIDE
SCH	SCHEDULE
SDR	STANDARD DIMENSION RATIO
SFFJT	SQUARE FORM FLUSH JOINT THREAD
SOC	SOCKET
SPG	SPIGOT
SS	STAINLESS STEEL
STA	STATION
SY	SQUARE YARD
THK	THICK
TYP	TYPICAL
VERT	VERTICAL
x	BY

NOT FOR CONSTRUCTION

REVIEW SUBMITTAL

JOHN M. RICHARDS — STATE OF WASHINGTON — 22555 — REGISTERED PROFESSIONAL ENGINEER

NO.	REVISION	DATE
A	ISSUED FOR CLIENT REVIEW	7/27/11
B	ISSUED FOR CLIENT REVIEW	8/3/11

SHEET TITLE: LEGEND

PROJECT TITLE: 2011 GAS SYSTEM EXPANSION
LANDFILL GAS COLLECTION & CONTROL SYSTEM (GCCS)
OLYMPIC VIEW SANITARY LANDFILL

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PROJ. NO.	07207006.10
DSN. BY:	TAM
DWN. BY:	LEL
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ACAD FILE:	G2
APP. BY:	JMR

DATE: JULY 2011

SCALE: NONE

DRAWING NO. G2

PART 1 GENERAL

1.01 SCOPE OF WORK

The work included in this contract is defined on the drawings and within these specifications, which form a portion of the Contract Documents. The project includes construction modifications (upgrades) and additions to the existing landfill gas collection and control system (GCCS) at the Olympic View Sanitary Landfill. The upgrades and additions to the landfill gas control system occur over existing final cover system of the Old Barney White Landfill area of the landfill. The Work required generally includes, but is not limited to, the following:

A. Furnish and install vertical gas extraction wells.

B. Furnish and install gas extraction well head control assemblies.

C. Furnish and install above ground HDPE pipe, including the fittings, valves, and pipe anchors.

D. Connect the new pipe to the existing buried conveyance pipe.

The owner will provide surveying for staking well locations and record drawings. The owner will provide filter back and embedment material for gas wells.

1.02 CONTRACTOR USE OF SITES AND PREMISES

A. Owner Operations at the Site: The Owner will continue to operate the existing landfill, which includes the scale house, scale, maintenance building, and recycling area. The landfill operating hours are 8:00 am to 5:00 pm Monday through Friday. Contractor work that will interrupt existing landfill vehicle traffic and landfill operations must be coordinated to occur outside the Owner's hours of operation. The phasing of the Contractor's work must be scheduled to allow the existing landfill operations to occur with minimum interruption.

B. The Contractor shall assume full responsibility for the protection and safekeeping of products stored on the site under this contract, and shall move any stored products under Contractor's control which interfere with the owner's operation.

C. Starting of the Work constitutes acceptance of existing conditions as suitable for completion of the Work.

1.03 CONTRACT DOCUMENTS

A. The Drawings and Specifications shall be considered complementary. If apparent conflicts are discovered, contact the Owner immediately for interpretation or corrections. In resolving inconsistencies among sections of the Contract Documents, precedence shall be given in the following order, unless specified elsewhere in the Contract Documents.

1. Contract
2. Supplemental Conditions
3. General Conditions
4. Specifications
5. Drawings

B. The intent of the Drawings is to convey the limits of the Work, location of features, typical and special conditions, and construction assemblies. The Drawings are intended for use by contractors who are qualified and experienced in work substantially similar to the work of this contract. As such the drawings do not include detail for all aspects of the work but rather only for aspects considered special and worthy of added detail. The Contractor is free to select methods for accomplishing the "un-detailed" work that comply with regulatory requirements and their "professional judgement". The intent of the Specifications is to establish minimum quality standards for products and materials and their installation related to the scope of work indicated on the Drawings. Figure dimensions on Drawings shall take precedence over scaled dimensions, and Detailed Drawings shall take precedence over General Drawings.

1.04 FEES AND PERMITS

A. Contractor shall secure and pay for all other required permits, government fees, and licenses. Pay for and obtain inspections by City, County, and State bodies as required.

1.05 DEFINITIONS

A. Backfill: Soils placed from the excavated surface to the existing and finish surface.

B. Embedment Material: material placed in contact with the pipe (and immediately adjacent to) for the purpose of providing structural support to the pipe and a porous region for transfer of gas/fluids into the piping system.

C. Final Backfill Material: For piping systems, that material placed above the embedment zone to the existing or proposed subgrade. For structures, that material placed above the base of the structure to the existing or proposed subgrade. For gas wells, select soil placed above the bentonite seal to the surface

D. Refuse: Manmade or naturally occurring waste products disposed of as part of landfill operations, as determined by the Owner.

E. Subgrade: The surface prepared to accept other materials.

F. Filter Pack: The select material surrounding the slotted or perforated (screened) pipe.

G. Bentonite Seal: The material which hydraulically separates the filter pack material from other designated formations or pipe segments.

H. Geosynthetics: Products manufactured from polymeric material to be used with geotechnical engineering-related materials as an integral part of civil engineering works. Geosynthetics including membranes, textiles, drainage net, bentonite mat, erosion control matting, and other geocomposites.

I. Geomembrane: very-low permeable synthetic membrane liner or barrier used to minimize fluid or gas migration in civil engineering works (also referred to as a membrane, flexible membrane liner, or FML).

J. Geotextile: A permeable textile material (usually synthetic) used with soil, rock, or any other geotechnical engineering-related material to enhance the performance or cost of a human-made product, structure, or system (also referred to as a textile or filter fabric).

K. Well Head Control Assembly: a device attached to a gas extraction well pipe used to control flow/pressure and allow for measurement of gas composition, well temperature, well pressure, system pressure, and flow.

1.06 SUBMITTALS

A. Submit samples of proposed materials to be used in construction, whether excavated and processed from materials on site or imported, for review and testing as required. Submit samples of sufficient size, quantity, and frequency, as determined by the testing service and Owner.

B. Submit quality control documentation.

C. Submit manufacturer's product data.

D. Submit a plan showing installation sequence and schedule.

E. Submit project record documents as specified hereinafter.

F. Shop Drawings: Submit shop drawings of all shop fabricated fittings. Submit a 300 mm (1-foot)-long sample of slotted/perforated pipe for approval of slot/perforation fabrication and pattern by the Owner prior to fabricating pipe.

G. Submit manufacturer's instructions pertaining to storage, handling, installation, and inspection of pipe and appurtenances furnished.

H. Submit Contractor's Health and Safety Plan for project records.

1.07 QUALITY ASSURANCE

A. Codes and Standards: Perform work in compliance with applicable requirements of governing authorities having jurisdiction and referenced codes and standards.

B. Testing and Inspection Service:

1. Owner will engage a testing and inspection service for quality assurance during construction.

2. Borehole logging will be conducted by the Owner for the purposes of this project. The Contractor shall endeavor to provide information on drilling conditions that will assist the Owner in making determinations of subsurface conditions and installation requirements. The Contractor shall provide safe access to the top of the borehole for the Owner. The Contractor shall provide instruments and determine depths during drilling and well construction as requested by the Owner.

C. Contractor shall be responsible for daily quality control including: analysis of soil processing operations to insure that the materials produced comply with the gradations and material specifications described hereinafter. Owner's testing and inspection service may make periodic random checks of the Contractor's processing and installation operations.

D. All materials intended for use shall be approved by the Owner prior to placement.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Labeling: Material received shall be labeled according to the manufacturer's standards.

B. Inspect materials delivered to the site for damage. Unload and store with minimum of handling. Store materials on-site in enclosures or under protective coverings. Store plastic piping and fittings in a flat, horizontal position, and under cover, out of direct sunlight. Do not sort materials directly on the ground. Keep inside of piping free of dirt and debris.

C. Handle pipe, fittings, and other accessories in a manner that ensures delivery to the point of installation in sound, undamaged condition. Carry, do not drag, pipe to the point of installation.

D. Deliver and stockpile backfill materials in a manner that prevents contamination and segregation.

1.09 PROTECTION OF WORK

A. Protect persons, both on and off the site, from injury. Barricade temporary open excavations occurring as part of the Work with suitable fences and barriers.

B. Protect trees, shrubs, lawns, existing structures, fences, roads, sidewalks, utilities, and other features that are to remain as part of the completed project site.

C. Immediately repair, at Contractor's cost, all damage caused by construction work.

1.10 SITE CONDITIONS

A. Landfill gas extraction wells shall be installed in the Landfill as shown on the Drawings. Landfill gas extraction wells shall be installed in refuse. The refuse is classified as municipal solid waste under state regulations. The character and extent of refuse that may be encountered during drilling or excavation is unknown. The Contractor is cautioned of the possibility of encountering potentially harmful gases, liquids, or wastes. Work near refuse may encounter harmful gases, liquids and soil, even if refuse is not found.

B. When it is necessary to excavate or drill into refuse in order to perform any of the work, the Contractor's Health and Safety Plan shall be strictly followed during drilling, excavating, handling, and disposing of the refuse, and whenever working in proximity to exposed refuse.

1.11 RECORD DOCUMENTS

Maintain at the job site one (1) permanent copy of the Contract Drawings, Specifications, Bulletins, Addenda, Change Orders, Reviewed Shop Drawings, and Construction Reports. Keep all documents current. Record location of concealed items, utility lines, field changes in dimensions of detail, and changes in materials furnished.

1.12 SUPERVISION

The Contractor shall provide competent supervision of the work. A superintendent shall represent the Contractor continuously throughout the project and all communications with him shall be binding upon the Contractor.

1.13 NON-CONFORMING WORK

Work not conforming to the Contract Documents and not acceptable to the Owner shall be removed and replaced at Contractor's expense. Execute cutting and patching of work as required to remove and replace non-conforming and defective work. Execute the removal and replacement by methods which will prevent damage to other work and will provide surfaces to receive installation of repairs that will comply with specified tolerances and finishes.

PART 2 PRODUCTS

2.01 PIPE EMBEDMENT AND FINAL BACKFILL MATERIAL

A. Embedment material, Type 2 (provided by Owner): for solid thermoplastic pipe shall be fine grained soil consisting of any combination of silts, sands, and/or clays as defined by the Unified Soil Classification System.

B. Final backfill, Type 1 (provided by Owner): for vertical gas extraction wells shall be fine grained soil consisting of any combination of silts, sands, and/or clays as defined by the Unified Soil Classification System.

2.02 HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS

A. HDPE pipe and fittings shall be made from polyethylene resin compound qualified as Type III, Category 5, Class C, Grade P34 in ASTM D-1248. The HDPE pipe and fittings shall conform to Cell Classification 345434C (ASTM D-3350). Pipe and fittings shall be of the nominal diameter and SDR shown on the Drawings.

B. Fittings shall be rated to match the pipes to which they are fused. Fittings shall be manufactured in accordance with ASTM D-3261, except as modified here.

1. Electro-fusion fittings shall be manufactured in accordance with ASTM F-1055.

2. Specialty fabricated fittings shall be fabricated as indicted on the Drawings. Fittings shall meet the requirements of ASTM D-3261.

2.03 POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

A. PVC pipe shall be Schedule 80 and conform to the requirements of ASTM D-1785, Type 1, Grade 1. PVC pipe shall also conform to U.S. Product Standard PS 21-70 as having the same outside diameter as iron pipe.

B. Slotted and perforated pipe shall be shop fabricated as shown on the drawings with machining tools specifically designed for thermoplastic pipe. Pipe shall be cut smoothly and uniformly, with no burrs or melt down evident upon inspection by the Owner. Cuttings resulting from slotting or perforating pipe shall be removed prior to use. Pipe interior shall be clean and smooth.

C. PVC fittings shall be Schedule 80 and conform to the requirements of ASTM D-2467, Type 1, Grade 1, Type 1. Fittings shall be socket spigot-type suitable for joining by solvent welding techniques except where indicated on the Drawings.

D. Solvent cement used for socket type joints on PVC pipe and fittings shall conform to ASTM D-2564.

E. Where indicated on the drawings, pipe joints shall have square form flush threads joint fabricated in accordance with ASTM F-480. Viton O-rings shall be provided for and air-tight seal. Couplings are not allowed when using square form flush thread joints.

F. Flexible PVC adapters shall be manufactured flexible PVC resistant to corrosion and ultraviolet degradation. Flexible adaptors shall be furnished with stainless steel band clamps with worm gear fasteners. Acceptable manufacturers include Ferrnco Incorporated or Mission Rubber Company.

2.04 CENTRALIZERS

Centralizers shall consist of 4 carbon steel bands (1/8 inch x 3/4 inch) with lengths suitable for boring diameter as shown on the Drawings. The bands shall be attached to the pipe with a carbon steel T-Bolt clamp.

2.05 SETTLEMENT JOINT

Settlement joints shall be fabricated as shown on the Drawings. The joint shall function to allow movement of the smaller diameter pipe vertically downward into the larger diameter pipe. The joint shall be fabricated to prevent the smaller diameter pipe from being pulled out of the joint when the pipe is exposed to longitudinal tension. The joint shall be strong enough to withstand installation conditions and be airtight.

2.06 FILTER PACK

Filter pack material (provided by Owner): for slotted thermoplastic pipe shall consist of clean washed round rock containing no fine material (0% passing No. 100 std US sieve), organic substances, or other deleterious material. Filter pack rock shall have a gradation of 3/4 inch to 1 1/2 inch US Standard Sieve size (2-inch minus).

2.07 BENTONITE SEAL

The bentonite seal shall be high swelling sodium montmorillonite (bentonite) containing no organic polymers. It shall be applied in the form of fast hydrating chips. The bentonite shall be processed into 3/8 inch minus chips. Acceptable products for fast hydrating bentonite chips include NaturaPel as manufactured by Wyo-Ben, Incorporated, Billings, Montana.

2.08 GEOMEMBRANE

Geomembrane for cover penetration seals shall be made of PVC or HDPE with nominal thickness as shown on the Drawings. Acceptable manufacturers include GSE Lining Technology, Poly-Flex, or Agru America.

2.09 GEOTEXTILE

Textile shall be made of polypropylene or polyester with a nominal unit weight as shown on the drawings. The material shall be made of continuous filament or staple filament fibers. The textile shall be constructed of non-woven, needle punched fibers oriented into a stable network so that the fibers retain their relative position with respect to each other. Acceptable manufacturers include GSE Lining Technology, Huesker, or TenCate Geosynthetics.

2.10 WELL HEAD CONTROL ASSEMBLIES

The wellhead control assemblies shall consist of PVC pipe and fittings, velocity measurement device, temperature sampling port, gas sampling port, well pressure sampling port, system pressure sampling port, gate valve, and insect caps for sampling ports. All wellhead piping and fittings shall be Schedule 80 PVC. Acceptable manufacturers include LFG-Specialties, LLC, (419) 425 -6235, Isco Industries, (800) 345 4726, or Forrer Supply Company, Inc. (800) 255-1030.

2.11 PVC FLEX HOSE

A. Corrugated flexible PVC hose with inside diameter matching outside diameter of rigid PVC pipe. Hose shall be capable of withstanding a vacuum of 757 mm (29.8 inches) of mercury, a pressure of 207 kPa (30 psi), and have an operating range of 10° C to 70° C (13° F to 158° F). The hose bend radius shall be, at a minimum, 2.6 times the diameter of the hose.

B. Stainless steel spiral double bolt clamp for PVC flex hose with corrugated spiral exteriors.

C. Acceptable manufactures includes Kanaflex.

2.12 METAL FRAMING SYSTEM FOR PIPE SUPPORTS, ANCHORS, AND GUIDES

A. General: Bolted metal framing systems shall be made of channel, fittings, and hardware as defined in the Metal Framing Manufacturers Association Standard Publication MFMA-1.

B. Metal Framing System Components:

Components shall be from a single manufacturer such as B-Line System, Inc., or Unistrut Corporation and include the following components:

1. Pipe Clamp – Model B2400 or P2558
2. Concrete Insert – Model B22I or P3253
3. Spring Nut – Model N226 or P1009
4. Bolt – Model HHCS 3/8 x Size or HHCS037 x Size

PART 3 EXECUTION

3.01 PREPARATION

A. Verify well locations with Owner prior to drilling.

B. Verify that the excavated trench surfaces are ready to receive work, and dimensions, alignment, grade and elevations are as shown on Drawings.

1. Hand trim excavations to required elevations.

2. Remove large stones or other hard matter which could damage geosynthetics piping or impede consistent backfilling or compaction.

3.02 DRILLING

A. Drill wells in sequence as directed by the Owner.

B. Extraction wells shall be drilled to the diameter and depth shown on the Drawings. Actual depth will be determined by the Owner and verified by the Contractor, by identifying the existing surface elevation and bottom of refuse. However, no guarantee of boring depth is implied.

C. Maintain vertical alignment while drilling. Alignment requirements during drilling are that any casing, liner, or drill tools can be run freely through the boring. At a minimum, any temporary or permanent pump must install freely to the bottom of each well.

D. In the event of encountering any impenetrable solid obstruction or impenetrable conditions caused by rapid sloughing of refuse from around the borehole, cease drilling, and promptly notify the Owner. The Owner will observe further drilling efforts and make the determination to relocate or complete the well at the achieved depth.

E. Refrain from leaving any uncompleted boreholes at the end of each work day. Any borehole started should be completed in the same work day.

F. If unavoidable, boreholes may be left uncompleted overnight, provided adequate safety precautions to cover the hole have been made and approved by the Contractor's Health and Safety Officer.

G. Measure uncompleted borehole to be left overnight for depth prior to commencement of drilling on next day. Redrill any collapsed holes at no additional cost to the Owner.

H. Dispose of drill cuttings (material removed from the boring) onsite at a location specified by the Owner.

3.03 ABANDONMENT

A. Any well that does not meet the alignment or other requirement, or which is contaminated by the Contractor, or any well on which the Contractor stops work will be considered abandoned at the Contractor's expense. No payment will be made for any work associated with the abandoned well. A new well shall be started in the immediate vicinity at a location designated by the Owner.

B. In the circumstance that the Owner directs the driller to abandon a borehole, the Contractor shall be compensated for depth of borehole drilled.

NOT FOR CONSTRUCTION
REVIEW SUBMITTAL

NO.	REVISION	DATE
A	ISSUED FOR CLIENT REVIEW	7/27/11
B	ISSUED FOR CLIENT REVIEW	8/3/11

SHEET TITLE: SPECIFICATIONS

PROJECT TITLE: 2011 GAS SYSTEM EXPANSION
LANDFILL GAS COLLECTION & CONTROL SYSTEM (GCCS)
OLYMPIC VIEW SANITARY LANDFILL

OLYMPIC VIEW SANITARY LANDFILL, INC.

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PROJ. NO. 07207006.10 | DSN. BY: TAM | DWN. BY: LEL | CHK. BY: EMS | ACAD FILE: G3 | APP. BY: JMR

DATE: JULY 2011

SCALE: NONE

DRAWING NO. G3

C. Well abandonment shall be accomplished by placing bentonite in the bottom of the hole as specified below to a depth of 1 meter (3 feet). The remainder of the hole shall be backfilled with onsite soil (provided by Owner) to a depth of 2 meters (6 feet) below existing grade. An additional seal of 1 meter (3 feet) of bentonite shall be placed as specified below. The remaining 1 meter (3 feet) shall be backfilled with onsite soil. No compensation shall be provided for backfilling an abandon boring.

3.04 WELL INSTALLATION

A. Install geotextile and initial filter pack.

B. Pipe Installation: Pipe and fittings shall be assembled according to manufacturer's recommendations and as shown on the Drawings. Pipe and fittings shall be assembled above ground and lowered into the hole as one piece. Take all tension off of the pipe by mechanical means and center the pipe in the middle of the borehole before starting to backfill.

Sufficient length shall be provided of solid pipe to extend above the ground to a height determined by the Owner. A PVC socket type cap shall be slipped onto the top and attach with screws (not glued) to prevent contamination of the well.

C. Filter Pack Placement: Place filter pack material around pipe (in annular space) by gradually pouring down the boring. The Contractor shall pour the material at a rate that does not cause bridging of material or displacement of pipe from center of hole; or damage pipe, fittings, or centralizers.

D. Install Geotextile as shown on Drawings.

E. Bentonite Seal Installation: Place bentonite chips by gradually pouring down the boring. The Contractor shall pour dry bentonite chips at a rate that does not cause bridging of material; displacement of pipe from center of hole; or damage pipe, fittings, or centralizers. The bentonite chips shall be poured in 300 mm (12 inch) deep increments until reaching the depth shown on the Drawings. Each increment shall be hydrated with potable water before placing the succeeding increment. The volume of water and application rate shall conform to the bentonite manufacturer's recommendations. Water for hydrating pellets shall be applied using a hose of sufficient length to dispense water at the seal location. The Contractor shall allow adequate time for hydrating bentonite (according to the bentonite manufacturer's recommendations) prior to subsequent backfilling of the boring.

F. Final Backfill Placement: Place final backfill material by gradually pouring down the hole. The Contractor shall pour the material at a rate that does not cause bridging of material or displacement of pipe from center of boring; or damage pipe, fittings, or centralizers. Place final backfill in a manner which leaves wellhead in a plumb vertical position.

G. Cleanup After Each Well: At the conclusion of all work activity at a boring, all drilling tools, extra casing, trash, refuse, cutting and other materials shall be removed from the area. No work shall begin on subsequent borings until the previous boring site has been cleaned up and restored to the condition prior to work. All miscellaneous trash materials shall be disposed of by the Contractor onsite at a location specified by the Owner.

3.05 EXCAVATION

A. General

1. 1. Excavation consists of removal of all types of material encountered when establishing required subgrade elevation, trench dimensions, and adequate support for elevations, grades, and alignment as shown on the Drawings.

2. 2. Unauthorized excavation consists of removal of materials beyond indicated subgrade/grade or finished elevations or dimensions without specific direction of Owner. Unauthorized excavation, as well as remedial work directed by Owner, shall be at Contractor's expense.

B. Trench Excavation

1. For gas and condensate pipe and other utility piping, trench excavation shall conform to ASTM D-2321, Section 6.

2. Walls of trenches below the elevation of the crown shall be maintained as vertical as possible. Where the trench excavation exceeds depths of 4 feet, the trench walls shall be sloped or structurally retained with trench boxes or sheeting, shoring, and bracing systems in accordance with applicable safety regulations.

3. Hand trim excavation. Remove loose matter, water softened subgrade, lumped subsoil, boulders, and rocks.

C. Excavation near Geosynthetics:

1. Request presence of Owner when excavating near geosynthetics. Do not expose geosynthetics without giving Owner opportunity for inspection.

2. Provide a "spotter" when using heavy equipment to expose geosynthetics. If using heavy equipment (other than manual labor) to expose geosynthetics, a person must be present during use of heavy equipment to assist the equipment operator in positioning equipment/attachments/tools so as not to damage geosynthetics.

3. Expose existing geosynthetics by carefully removing overlying material without damaging existing geosynthetics.

4. Protect exposed geosynthetics from soil, rock, sloughing off the face of the excavation, etc. until the geosynthetics connections are complete and accepted by the Owner. If a temporary shoring system is used for this purpose, it shall have a flat surface and be heavily padded where in contact with the existing geotextile and geomembrane, so as not to damage or weaken them.

3.06 JOINING OF GAS CONVEYANCE PIPE

A. Join pipe, fittings, and accessories in accordance with manufacturer's recommendations.

B. HDPE Pipe:

1. Solid HDPE pipe shall have air tight joints; Joints shall be butt-fusion welded in strict accordance with the manufacturer's recommendations and ASTM D-3261, except where indicated on the Drawings. Butt-fusion shall be done with equipment recommended by the pipe manufacturer. Butt-fusion equipment shall be capable of meeting the pipe manufactures recommend fusion temperature, pressure, and alignment. Butt fusion joining shall be 100 percent efficient offering a joint weld strength equal to, or greater than the tensile strength of the pipe.

C. PVC pipe shall be joined with solvent cement in accordance with ASTM D-2855 and ASTM D-402, except where indicated on the Drawings.

D. Bell, barbed, or threaded joints shall be installed with the male end upgradient from the female end unless indicated otherwise on the Drawings.

3.07 PLACEMENT OF PIPE

A. Install pipe, fittings, and accessories in accordance with manufacturer's instructions and industry standards listed above.

B. Place pipe on prepared bedding layer.

C. Lay pipe to grades shown on Drawings, with maximum variation from true grade of 1/8-inch in 10 feet.

D. Pipes shall be free from burrs, nicks, gouges, surface cracks, or defects. Pipe shall be open, clean, and free draining.

3.08 FIELD QUALITY CONTROL

A. Alignment and Grade

1. The Contractor shall provide grade and alignment control during pipe laying. The Contractor shall provide stakes or similar devices that display relevant information to control work. The Contractor shall immediately set new grade markers which have been disturbed.

B. Cleaning

1. Pipes shall be cleaned to remove shavings, welding slag, dirt, construction debris, and other foreign material before activation of system. Cleaning shall be accomplished by method approved by the Owner such as flushing with clean water (at a minimum velocity of 1 m/s (3 fps)), compressed air, or pigging the pipe.

3.09 BACKFILL AND FINAL BACKFILL CONSTRUCTION

A. Maintain optimum moisture content of fill materials to attain required compaction density.

B. Placement of foundation, embedment and final backfill for pipe systems

1. Installation shall conform to ASTM D-2321, Section 7, except as specified below.

2. Foundation material, if required by the Owner, shall be moisture conditioned (as required), placed in loose layers no greater than 200 mm (8 inches), and compacted to the specified density.

3. Embedment and bedding material shall be moisture conditioned (as required). Bedding shall be placed to the depth as shown on the Drawings. Hunching shall be placed in loose layers no greater than 200 mm (8 inches) or 3/4 of the pipe diameter (whichever is smaller).

4. Backfill and Final Backfill shall be moisture conditioned (as required), placed in loose layers no greater than 300 mm (12 inches) and wheel roll to the satisfaction of the Owner. Place in a manner which does not damage or displace detector tape.

C. Excess backfill material shall be stockpiled or disposed of onsite as directed by the Owner.

3.10 SUBGRADE AND FINISHED SURFACES

A. All areas covered by the work, including excavated and filled sections, shall be uniformly backbladed to the subgrade or finished ground elevations. The finish surface shall be reasonably smooth and free of irregularities.

B. Area where excavation disrupted a surface system such as vegetation soil, surfacing, pavement or cover system (such as topsoil, gravel, asphalt, and/or barrier soil), shall be restored to the original surfacing. For vegetated surfaces this includes installation of seed and mulch.

3.11 GEOMEMBRANE

A. Verify the subgrade meets requirements for density, grade/elevation, and surface appearance and has been tested, surveyed, inspected, and accepted for placement of overlying materials. Do not begin without verifying with Owner.

B. Request presence of Owner during placement of material and testing of seams. Do not place without giving Owner opportunity for inspection.

C. Prepare surface to receive geomembrane by removing all objects which may damage geomembrane. Hand rake and grade smooth.

D. Prepare existing geomembrane for connection to new geomembrane by removing all objects which may damage the geomembrane. Hand brush the existing geomembrane.

E. Install geomembrane in accordance with manufacturer's recommendations.

F. The geomembrane shall be seamed in strict accordance with EPA Technical Guidance Document, EPA/530/SW-91/051, "Inspection Techniques for Fabrication of Geomembrane Field Seams". All seams shall be air tight and tested for air leaks, continuity, and strength. Trial seams and leak testing shall be done in accordance with EPA Technical Guidance Document EPA/600/R-EPA/600/R-93/182, "Quality Assurance and Quality Control for Waste Containment Facilities".

3.12 GEOTEXTILE

A. If the textile is to be installed over other geosynthetic components, request verification from Owner that underlying geosynthetics have been inspected and is ready to receive overlying textile.

B. Prepare surface to receive textile by removing all objects air brush clean surface.

C. Request presence of Owner during placement of material. Do not place without giving Owner opportunity for inspection.

3.13 WELL HEAD CONTROL ASSEMBLIES

The assemblies shall be installed on the wellheads as shown on the Drawings in accordance with the manufacturer's written instructions and installation details.

3.14 SITE RESTORATION

A. All areas covered by the work, including excavated and filled sections, shall be uniformly back bladed to the subgrade or finished ground elevations. The finish surface shall be reasonably smooth and free of irregularities.

B. Area where excavation disrupted a surface system such as vegetation soil, surfacing, pavement or cover system (such as topsoil, gravel, asphalt, and/or barrier soil), shall be restored to the original surfacing.

3.15 ACCEPTANCE

The piping work will be accepted by the Owner when:

A. Conformance test results meet the requirements of the Contract Documents.

B. Required documentation from manufacturer, fabricator, installer, and laboratory has been received and accepted.

C. All repairs have been completed to the Owner's satisfaction.

D. Written certification documents, including as-built drawings have been received by the Owner.

E. The Contractor has removed all equipment, excess materials, and debris from the site.

NOT FOR CONSTRUCTION
REVIEW SUBMITTAL

NO.	REVISION	DATE
A	ISSUED FOR CLIENT REVIEW	7/27/11
B	ISSUED FOR CLIENT REVIEW	8/3/11

SHEET TITLE: SPECIFICATIONS

PROJECT TITLE: 2011 GAS SYSTEM EXPANSION
LANDFILL GAS COLLECTION & CONTROL SYSTEM (GCCS)
OLYMPIC VIEW SANITARY LANDFILL

OLYMPIC VIEW SANITARY LANDFILL, INC.

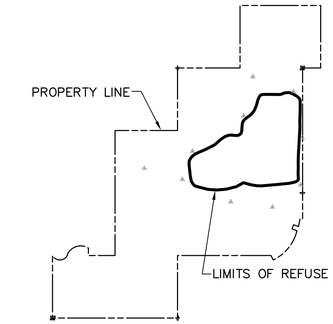
SCS ENGINEERS
Environmental Consultants and Contractors
2405 140th Avenue NE, Suite 107
Bellevue, Washington 98005
(425) 746-4600 FAX: (425) 746-6747

PROJ. NO.	07207006.10
DSN BY:	TAM
DWN BY:	LEL
CHK BY:	EMS
ACAD FILE:	G4
APP. BY:	JMR

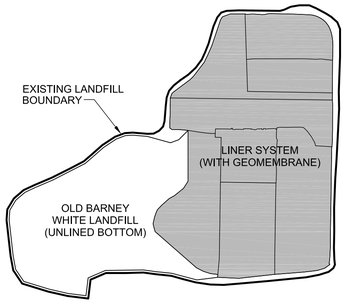
DATE: JULY 2011

SCALE: NONE

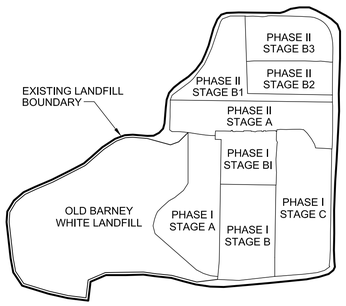
DRAWING NO. G4



KEY MAP



LIMITS OF LINER SYSTEM KEY MAP



CELL BOUNDARIES KEY MAP

NOTES:

1. TOPOGRAPHY BASED ON AERIAL PHOTO DATED MARCH 3, 2006.
2. WASH RACK SHED, WELDING SHOP, MAINTENANCE BUILDING, OLD TOLL BOOTH AND MAIN WELL PUMP HOUSE DEMOLISHED JUNE 30, 2009.

STEELMAN WELL
EAST FORK UNION RIVER
UNION RIVER
LIMITS OF REFUSE AND COVER SYSTEM
SCALE HOUSE
SOUTH SLOPE WELL PUMP HOUSE
SEE DRAWING C2 AND C3
Tributary #0512
Unnamed Tributary
Tributary #0513
Rock
Rock
WETLAND
N 190000
N 189000
N 188000
N 187000
E 1156000
E 1157000
E 1158000
E 1159000
E 1160000

GRAPHIC SCALE:
0 200 400 600
SCALE IN FEET

NO.	REVISION	DATE
A	ISSUED FOR CLIENT REVIEW	7/27/11
B	ISSUED FOR CLIENT REVIEW	8/3/11

SHEET TITLE: GAS SYSTEM SITE PLAN

PROJECT TITLE: 2011 GAS SYSTEM EXPANSION
LANDFILL GAS COLLECTION & CONTROL SYSTEM (GCCS)
OLYMPIC VIEW SANITARY LANDFILL

OLYMPIC VIEW SANITARY LANDFILL, INC.

SCS ENGINEERS
Environmental Consultants and Contractors
2405 140th Avenue NE, Suite 107
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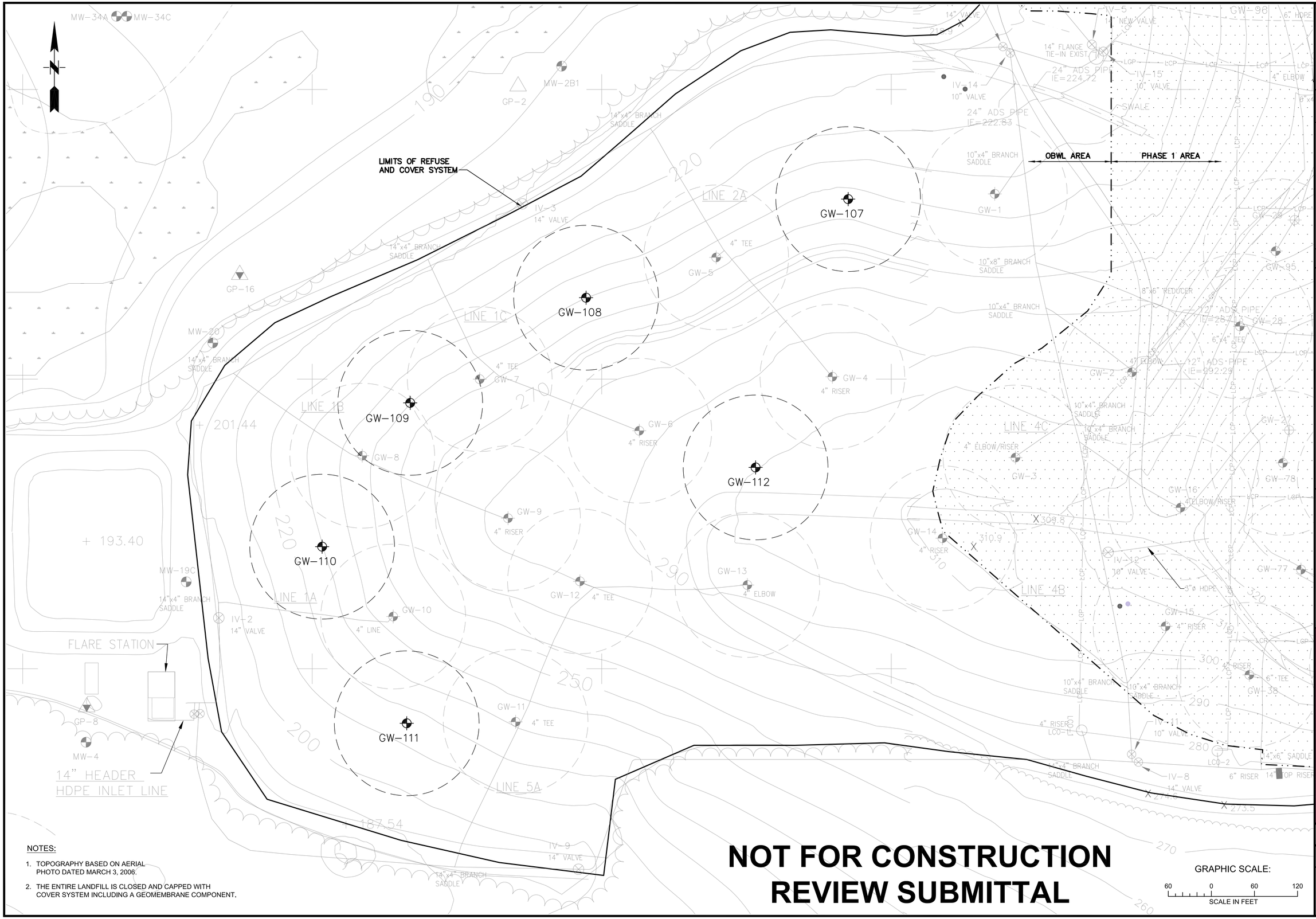
ACAD FILE:	C1
APP. BY:	JMR
DWN. BY:	LEL
CHK. BY:	EMS
PROJ. NO.	072307006.10
DSN. BY:	TAM

DATE: JULY 2011

SCALE: 1" = 200' (22x34 SHEET)

DRAWING NO. C1



NOTES:

1. TOPOGRAPHY BASED ON AERIAL PHOTO DATED MARCH 3, 2006.
2. THE ENTIRE LANDFILL IS CLOSED AND CAPPED WITH COVER SYSTEM INCLUDING A GEOMEMBRANE COMPONENT.

NOT FOR CONSTRUCTION
REVIEW SUBMITTAL

GRAPHIC SCALE:
60 0 60 120
SCALE IN FEET

NO.	REVISION	DATE
1	ISSUED FOR CLIENT REVIEW	7/27/11
2	ISSUED FOR CLIENT REVIEW	8/3/11

SHEET TITLE: GAS EXTRACTION NETWORK AND CONVEYANCE PIPING PLAN

PROJECT TITLE: 2011 GAS SYSTEM EXPANSION
LANDFILL GAS COLLECTION & CONTROL SYSTEM (GCCS)
OLYMPIC VIEW SANITARY LANDFILL

OLYMPIC VIEW SANITARY LANDFILL, INC.

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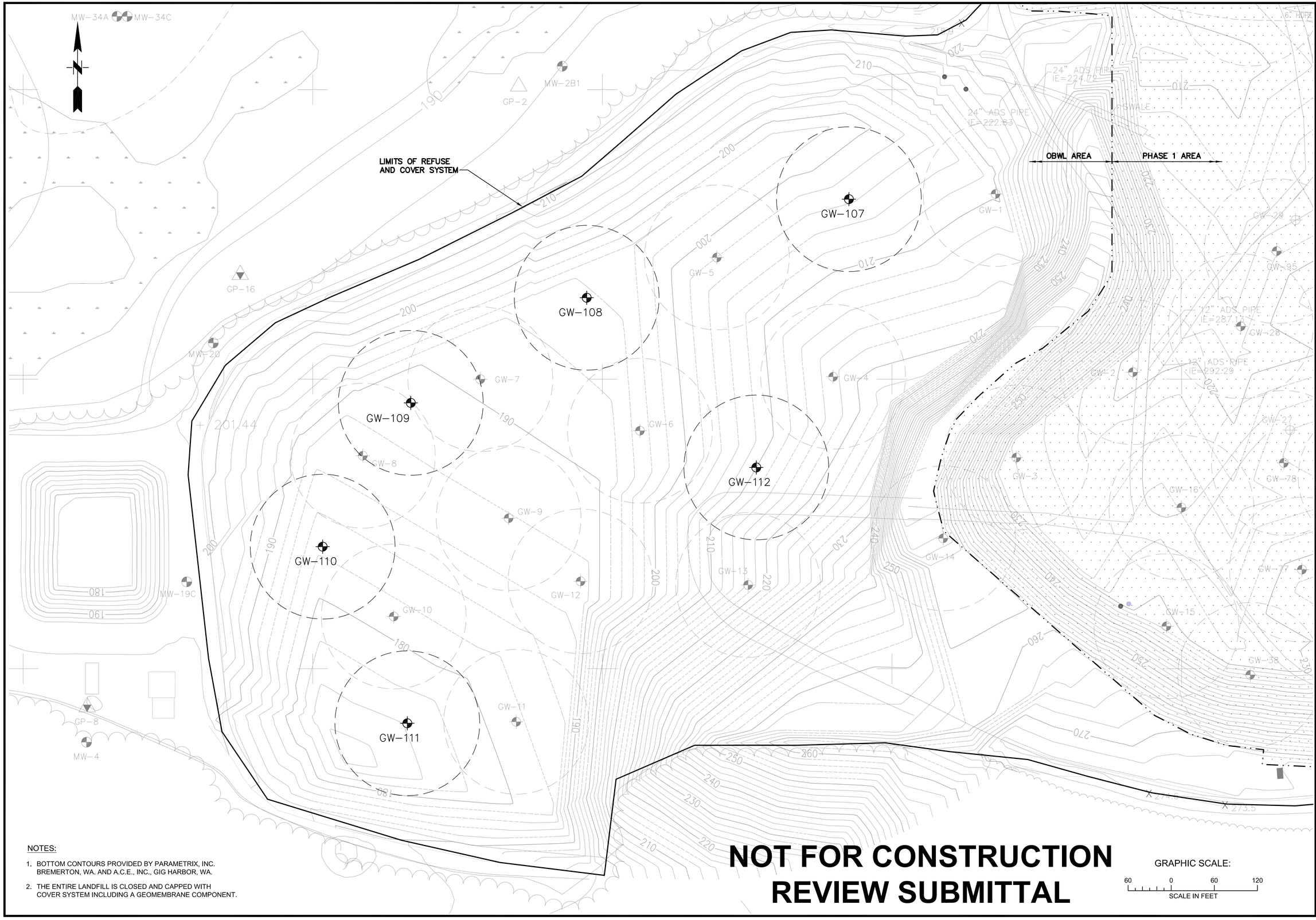
PROJ. NO.	07207006.10
DSN. BY:	TAM
DWN. BY:	LEL
CHK. BY:	TAM
ACAD FILE:	C2
APP. BY:	JMR

DATE: JULY 2011

SCALE: 1" = 60'-0" (22x34 SHEET)

DRAWING NO. C2



NOTES:

1. BOTTOM CONTOURS PROVIDED BY PARAMETRIX, INC. BREMERTON, WA. AND A.C.E., INC., GIG HARBOR, WA.
2. THE ENTIRE LANDFILL IS CLOSED AND CAPPED WITH COVER SYSTEM INCLUDING A GEOMEMBRANE COMPONENT.

NOT FOR CONSTRUCTION
REVIEW SUBMITTAL

GRAPHIC SCALE:
60 0 60 120
SCALE IN FEET

NO.	REVISION	DATE
A	ISSUED FOR CLIENT REVIEW	7/27/11
B	ISSUED FOR CLIENT REVIEW	8/3/11

SHEET TITLE: LANDFILL BOTTOM SURFACE CONTOUR MAP

PROJECT TITLE: 2011 GAS SYSTEM EXPANSION
LANDFILL GAS COLLECTION & CONTROL SYSTEM (GCCS)
OLYMPIC VIEW SANITARY LANDFILL

OLYMPIC VIEW SANITARY LANDFILL, INC.

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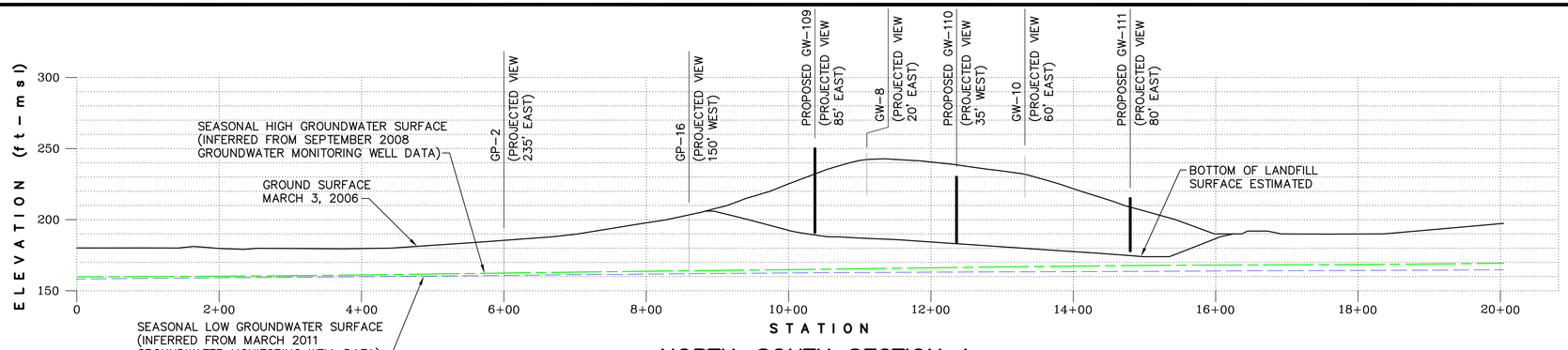
ACAD FILE:	C3
APP. BY:	JMR
DWN. BY:	LEL
CHK. BY:	EMS
PROJ. NO.	07207006.10
DSN. BY:	TAM

DATE: JULY 2011

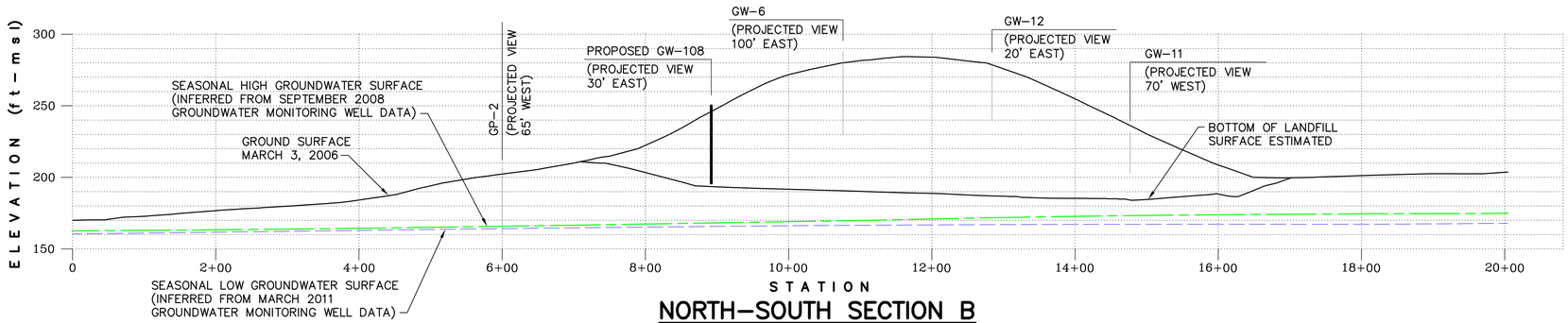
SCALE: 1" = 60'-0" (22x34 SHEET)

DRAWING NO.
C3



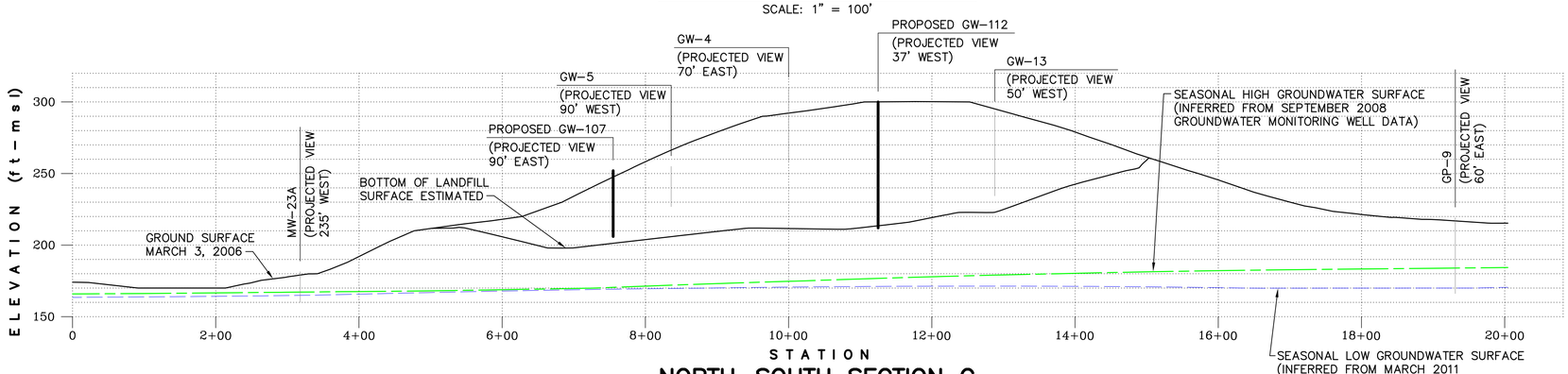
NORTH–SOUTH SECTION A

SCALE: 1" = 100'



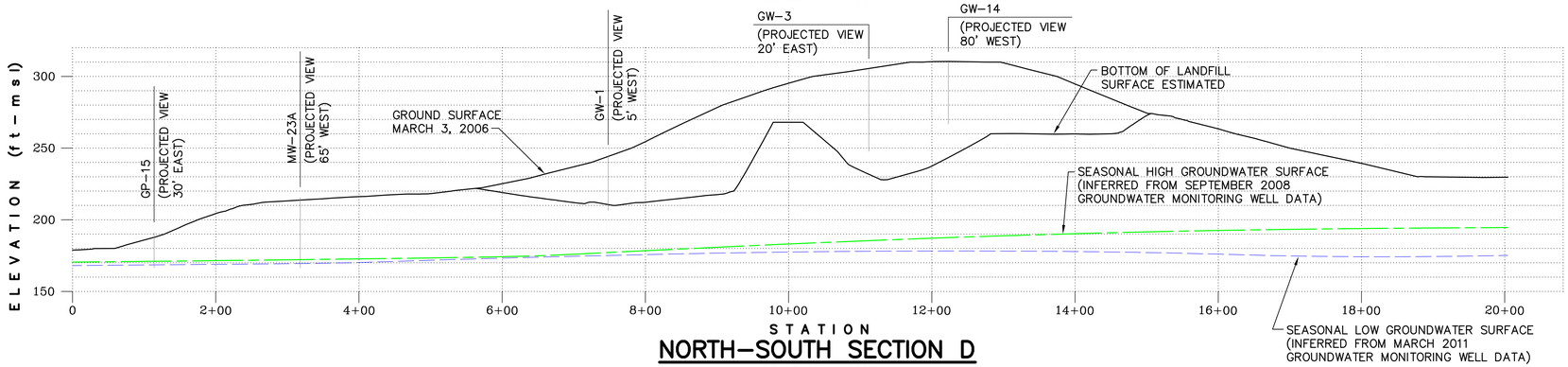
NORTH–SOUTH SECTION B

SCALE: 1" = 100'



NORTH–SOUTH SECTION C

SCALE: 1" = 100'

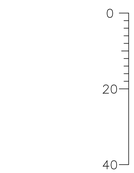


NORTH–SOUTH SECTION D

SCALE: 1" = 100'

NOT FOR CONSTRUCTION
REVIEW SUBMITTAL

GRAPHIC SCALE:



NO.	REVISION	DATE
A	ISSUED FOR CLIENT REVIEW	7/27/11
B	ISSUED FOR CLIENT REVIEW	8/3/11

SHEET TITLE
LANDFILL NORTH-SOUTH SECTIONS

PROJECT TITLE
2011 GAS SYSTEM EXPANSION
LANDFILL GAS COLLECTION & CONTROL SYSTEM (GCCS)
OLYMPIC VIEW SANITARY LANDFILL

OLYMPIC VIEW SANITARY LANDFILL, INC.

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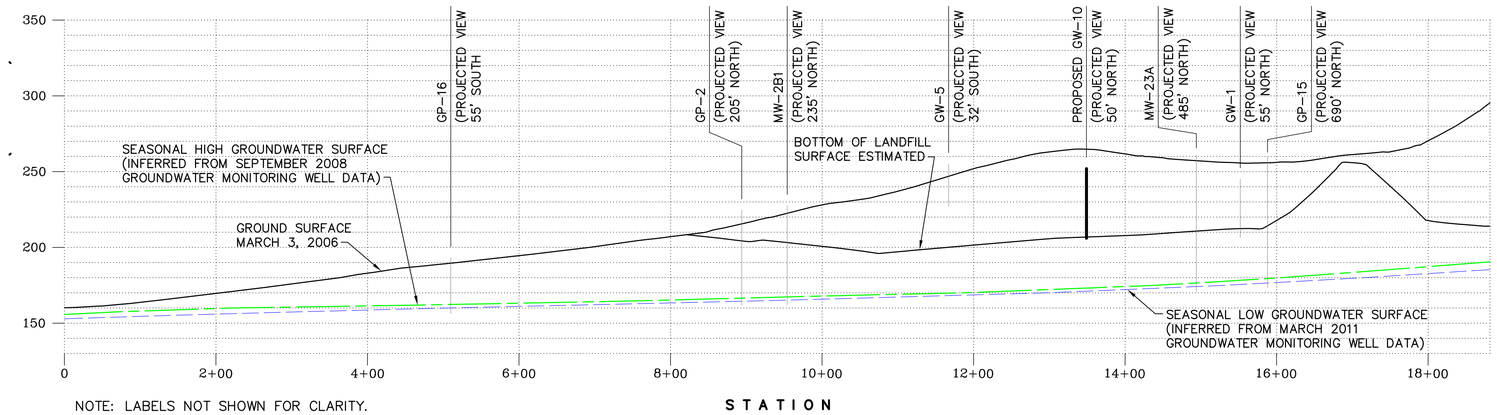
PROJ. NO:	07207006.10	ACAD FILE:	C4
DSN. BY:	TAM	DWN. BY:	LEL
CHK. BY:	TAM	APP. BY:	JNR

DATE: JULY 2011

SCALE: VERT: 1" = 20'
HORIZ: 1" = 100'
(22x34 SHEET)

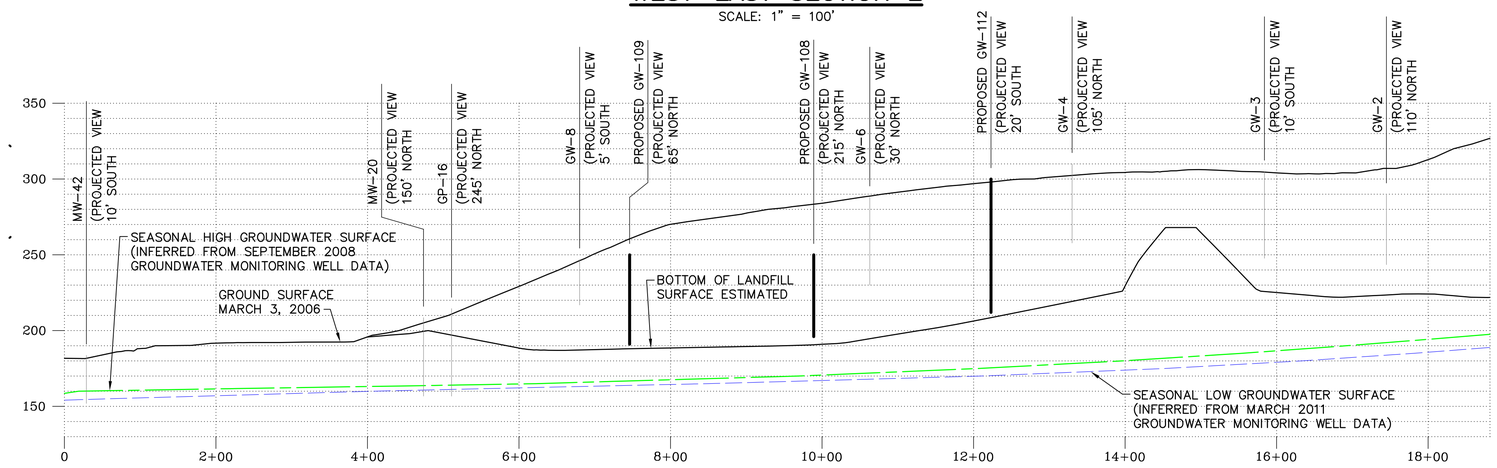
DRAWING NO.
C4



NOTE: LABELS NOT SHOWN FOR CLARITY.

WEST-EAST SECTION E

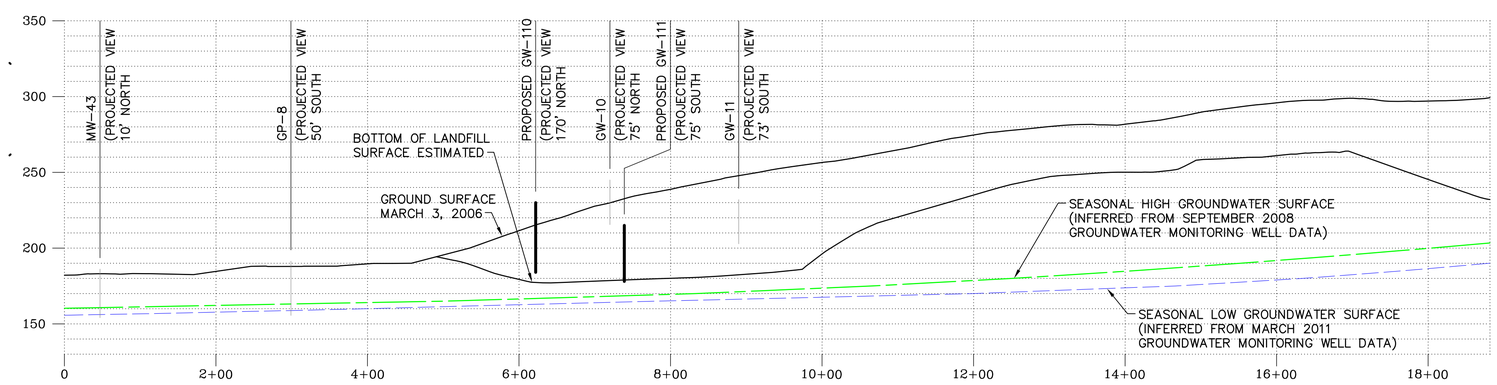
SCALE: 1" = 100'



NOTE: LABELS NOT SHOWN FOR CLARITY.

WEST-EAST SECTION F

SCALE: 1" = 100'



NOTE: LABELS NOT SHOWN FOR CLARITY.

WEST-EAST SECTION G

SCALE: 1" = 100'

NOT FOR CONSTRUCTION
REVIEW SUBMITTAL

GRAPHIC SCALE:

VERTICAL SCALE IN FEET

HORIZONTAL SCALE IN FEET

NO.	REVISION	DATE
A	ISSUED FOR CLIENT REVIEW	7/27/11
B	ISSUED FOR CLIENT REVIEW	8/3/11

SHEET TITLE: LANDFILL WEST-EAST SECTIONS

PROJECT TITLE: 2011 GAS SYSTEM EXPANSION
LANDFILL GAS COLLECTION & CONTROL SYSTEM (GCCS)
OLYMPIC VIEW SANITARY LANDFILL

OLYMPIC VIEW SANITARY LANDFILL, INC.

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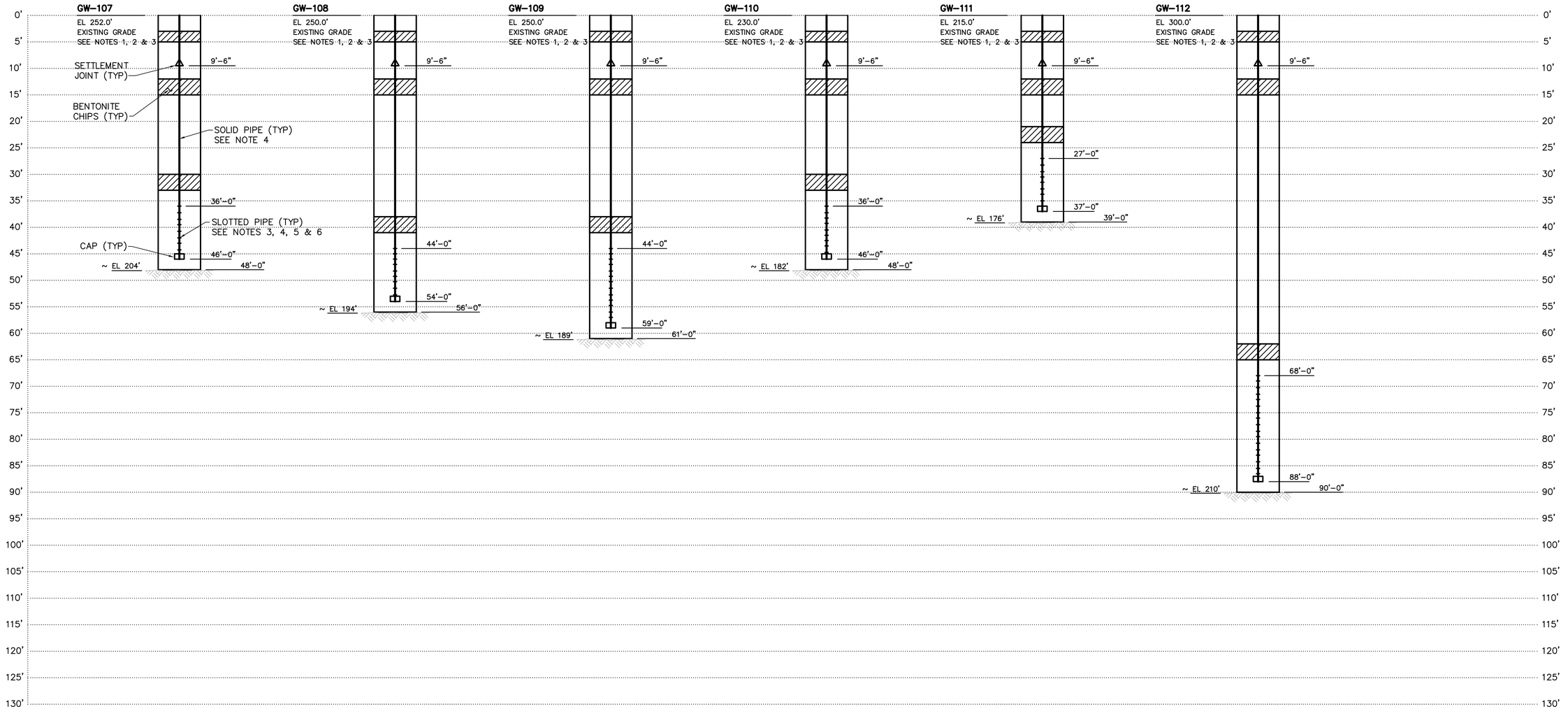
PROJ. NO.	07207006.10	ACAD FILE:	C5
DSN. BY:	TAM	DWN. BY:	LEL
CHK. BY:	TAM	APP. BY:	JNR

DATE: JULY 2011

SCALE: VERT: 1" = 20'
HORIZ: 1" = 100'
(22x34 SHEET)

DRAWING NO.
C5



NOTES:

1. DRILLING TO COMMENCE AFTER OWNER CONFIRMS EXISTING SURFACE ELEVATIONS.
2. FOR ADDITIONAL WELL DETAILS SEE DRAWING C7.
3. BORING DEPTHS SHOWN ARE APPROXIMATE AND INTENDED ONLY FOR BIDDING. CONTRACTOR SHALL INSTALL ALL WELLS TO DEPTH DIRECTED BY OWNER.
4. SOLID AND SLOTTED PIPE SHALL BE SUPPLIED IN STANDARD LENGTHS OF 5'–0", 10'–0" AND 20'–0".
5. FIELD ADJUSTMENTS IN PIPE LENGTH SHALL BE DONE ONLY BY CUTTING OFF THE LOWEST PORTION OF THE LOWEST SECTION OF SLOTTED PIPE.
6. LENGTH OF SLOTTED PIPE TO BE DETERMINED IN THE FIELD BY THE ENGINEER.

GRAPHIC SCALE:

10 0 10 20

1" = 10'

NOT FOR CONSTRUCTION
REVIEW SUBMITTAL

JAMES M. RICHARDS — STATE OF WASHINGTON — 19955 — REGISTERED PROFESSIONAL ENGINEER

NO.	REVISION	DATE
A	ISSUED FOR CLIENT REVIEW	7/27/11
B	ISSUED FOR CLIENT REVIEW	8/3/11

SHEET TITLE: VERTICAL GAS EXTRACTION WELL PROFILES

PROJECT TITLE: 2011 GAS SYSTEM EXPANSION
LANDFILL GAS COLLECTION & CONTROL SYSTEM (GCCS)
OLYMPIC VIEW SANITARY LANDFILL

WM WASTE MANAGEMENT
OLYMPIC VIEW SANITARY LANDFILL, INC.

SCS ENGINEERS
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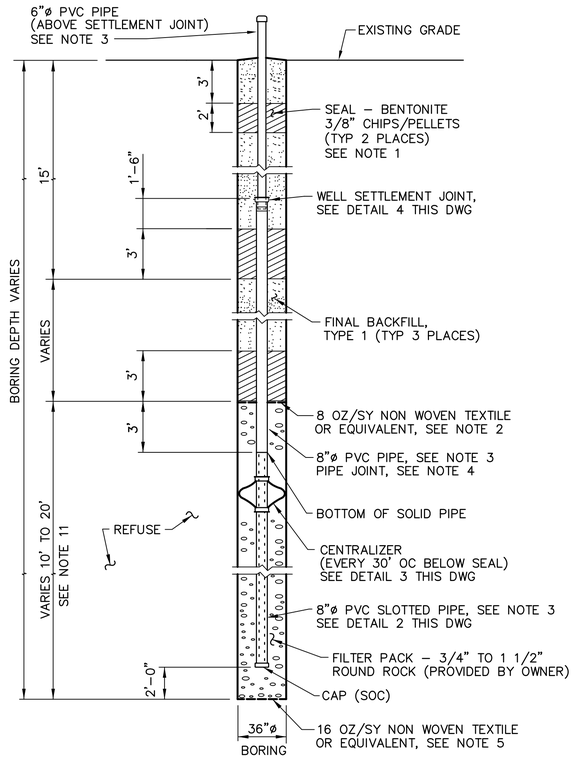
PROJ. NO.	07207006.10
DSN. BY:	TAM
DWN. BY:	LEL
CHK. BY:	TAM
ACAD FILE:	C6
APP. BY:	JMR

DATE: JULY 2011

SCALE: 1" = 10'-0" (22x34 SHEET)

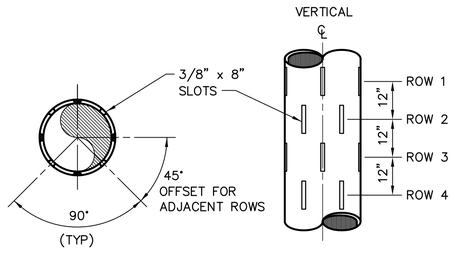
DRAWING NO. C6



VERTICAL GAS EXTRACTION WELL

DETAIL 1 / C2

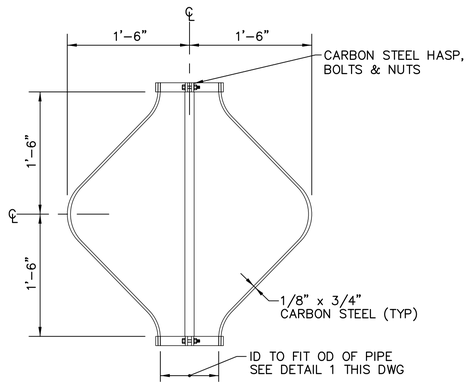
SCALE: NTS



VERTICAL SLOTTED PIPE

DETAIL 2 / –

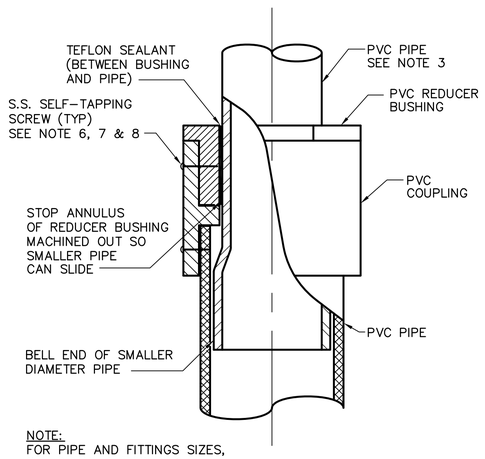
SCALE: NTS



CENTRALIZER

DETAIL 3 / –

SCALE: NTS

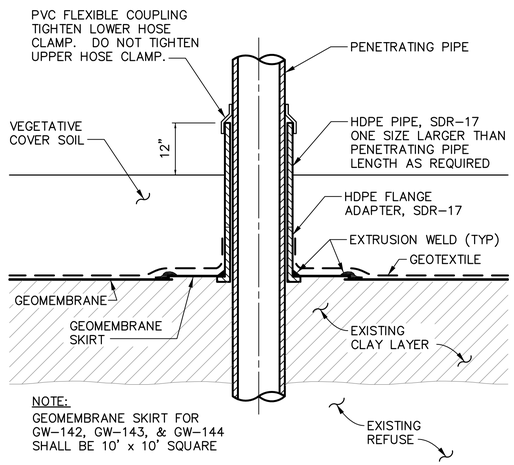


NOTE:
FOR PIPE AND FITTINGS SIZES,
SEE DETAIL 1 THIS DWG.

WELL SETTLEMENT JOINT

DETAIL 4 / –

SCALE: NTS



NOTE:
GEOMEMBRANE SKIRT FOR
GW–142, GW–143, & GW–144
SHALL BE 10' x 10' SQUARE

COVER PENETRATION SEAL

DETAIL 5 / –

SCALE: NTS

NOTES:

1. HYDRATE BENTONITE PELLETS WITH WATER IN 12 INCH INCREMENTS OF BENTONITE.
2. CUT TEXTILE INTO 3' x 3' SQUARES, WEIGHT, AND DROP INTO PLACE UNTIL ROCK IS COMPLETELY COVERED.
3. ALL PVC PIPE SHALL BE SCHEDULE 80 UNLESS NOTED OTHERWISE.
4. PIPE JOINTS SHALL BE SQUARE FORM–FLUSH THREAD JOINTS (SFFTJ) UNLESS NOTED OTHERWISED.
5. USE 6' x 6' SQUARE PIECE OF TEXTILE. WRAP TEXTILE AROUND DRAIN ROCK AND TIE ENDS OF TEXTILE TOGETHER THEN PLACE IN BOTTOM OF BORING.
6. SIX SS SELF–TAPPING SCREWS SHALL BE SPACED EQUAL DISTANCE AROUND PIPE CIRCUMFERENCE AT EACH LOCATION.
7. SCREWS SHALL BE OF SUFFICIENT LENGTH FOR JOINT STRENGTH AND ALLOW FREE MOVEMENT OF THE SMALLER DIAMETER PIPE.
8. SCREWS SHALL NOT EXTEND THROUGH PIPE WALL.
9. ALL HDPE PIPE SHALL BE SDR 17.0 UNLESS NOTED OTHERWISE.
10. HDPE PIPE JOINT SHALL BE THERMAL BUTT FUSION WELDED UNLESS NOTED OTHERWISE. ELECTRO–FUSION FITTINGS & FLANGES ARE NOT ALLOWED UNLESS NOTED OTHERWISE OR AUTHORIZED BY OWNER.
11. DEPTH TO BE DETERMINED IN THE FIELD BY ENGINEER.

NOT FOR CONSTRUCTION
REVIEW SUBMITTAL

NO.	REVISION	DATE
A	ISSUED FOR CLIENT REVIEW	7/27/11
B	ISSUED FOR CLIENT REVIEW	8/3/11

SHEET TITLE
VERTICAL GAS EXTRACTION WELL DETAILS

PROJECT TITLE
2011 GAS SYSTEM EXPANSION
LANDFILL GAS COLLECTION & CONTROL SYSTEM (GCCS)
OLYMPIC VIEW SANITARY LANDFILL

OLYMPIC VIEW SANITARY
LANDFILL, INC.

SCS ENGINEERS
Environmental Consultants and Contractors
2405 140th Avenue NE, Suite 107
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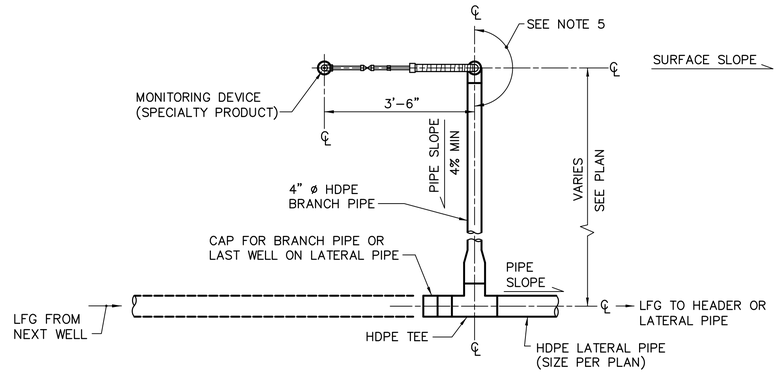
PROJ. NO.	DSN. BY:	DWN. BY:	CHK. BY:	ACAD FILE:	APP. BY:
07207006.10	TAM	LEL	EMS	C7	JMR

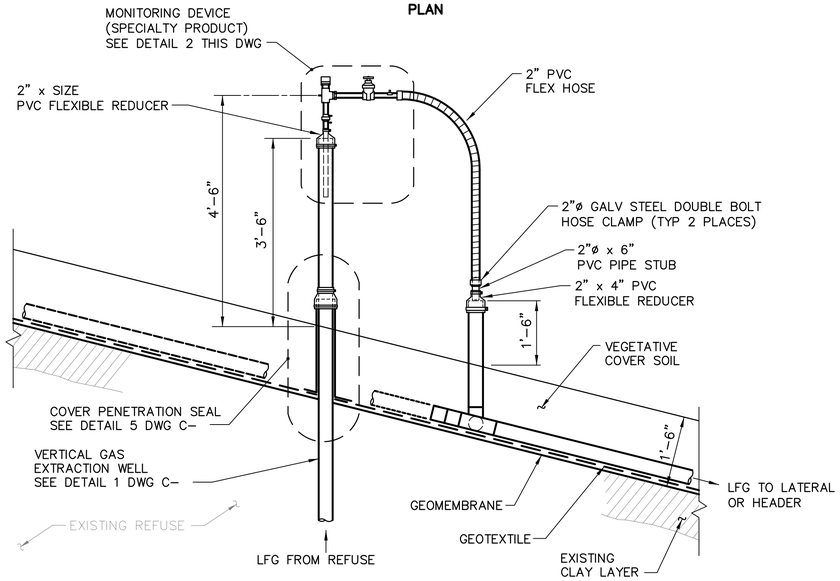
DATE: JULY 2011

SCALE: AS SHOWN

DRAWING NO.
C7



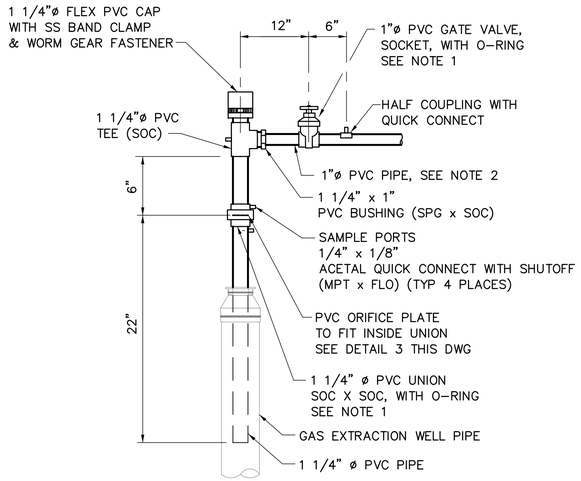
PLAN



ELEVATION

WELL HEAD CONTROL ASSEMBLY

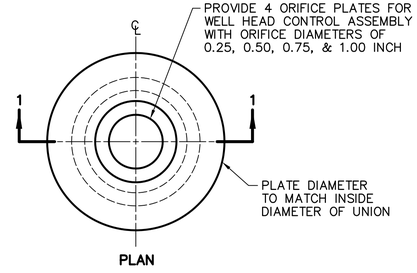
DETAIL 1 / C-
SCALE: NTS



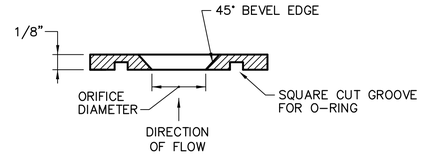
PROVIDED BY OWNER

VERTICAL MONITORING DEVICE

DETAIL 2 / C- 2 / C-
NO SCALE



PLAN



SECTION 1-1

ORIFICE PLATE

DETAIL 3 / -
NO SCALE

NOTES:

1. ALL ELASTOMERIC SEALS (e.g., GASKETS, O-RINGS, ect.) SHALL BE NITRILE OR VITON.
2. ALL PVC PIPE SHALL BE SCHEDULE 80 UNLESS NOTED OTHERWISE.
3. ALL HDPE PIPE SHALL BE SDR 17.0 UNLESS NOTED OTHERWISE.
4. HDPE PIPE JOINTS SHALL BE THERMAL BUTT FUSION WELDED UNLESS NOTED OTHERWISE. ELECTRO-FUSION FITTINGS & FLANGES ARE NOT ALLOWED UNLESS NOTED OTHERWISE OR AUTHORIZED BY OWNER.
5. ORIENTATION VARIES AS DIRECTED BY ENGINEER.

NOT FOR CONSTRUCTION
REVIEW SUBMITTAL

NO.	REVISION	DATE
A	ISSUED FOR CLIENT REVIEW	7/27/11
B	ISSUED FOR CLIENT REVIEW	8/3/11

SHEET TITLE: GAS AND CONDENSATE CONVEYANCE PIPE DETAILS

PROJECT TITLE: 2011 GAS SYSTEM EXPANSION
LANDFILL GAS COLLECTION & CONTROL SYSTEM (GCCS)
OLYMPIC VIEW SANITARY LANDFILL

OLYMPIC VIEW SANITARY LANDFILL, INC.

SCS ENGINEERS
Environmental Consultants and Contractors
2405 140th Avenue NE, Suite 107
Bellevue, Washington 98005
(425) 746-4600 FAX: (425) 746-6747

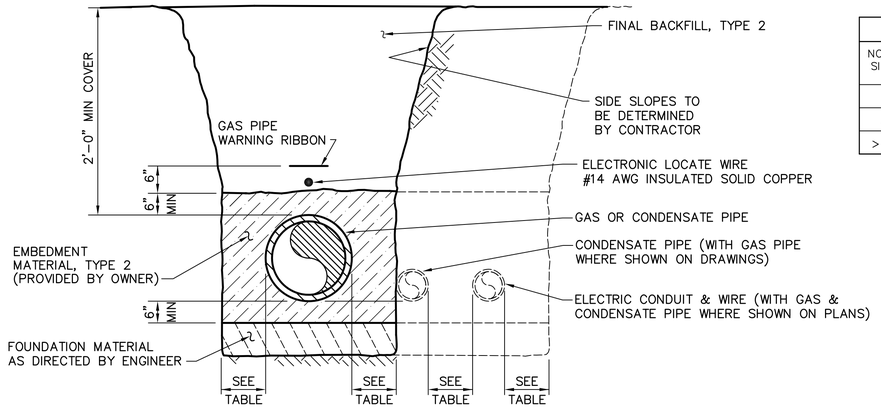
PROJ. NO.	DWN. BY:	CHK. BY:	DSN. BY:
07207006.10	LEL	EMS	TAM

ACAD FILE: C8
APP. BY: JMR

DATE: JULY 2011

SCALE: AS SHOWN

DRAWING NO. C8



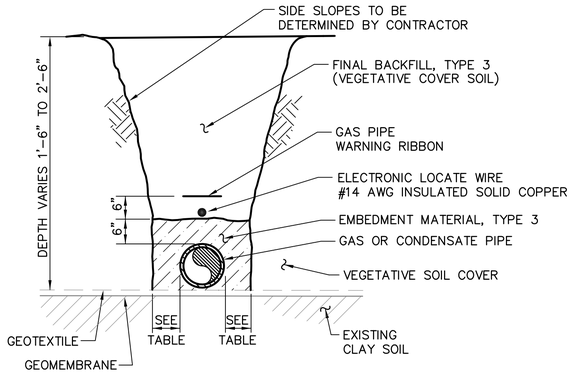
MINIMUM TRENCH WIDTH & PIPE SEPARATION		
NOMINAL PIPE SIZE, INCHES	MINIMUM TRENCH WIDTH, INCHES	PARALLEL PIPE CLEARANCE INCHES
< 3"	12"	4"
3" ≤ 16"	PIPE O.D. + 12"	6"
> 16" ≤ 34"	PIPE O.D. + 18"	9"

(FOR GAS, CONDENSATE, & LEACHATE CONVEYANCE PIPES IN INTERIM COVER SOIL)

PIPE TRENCH – TYPE 1

DETAIL 1 C–

SCALE: NTS



(FOR GAS CONVEYANCE IN FINAL COVER SYSTEM)

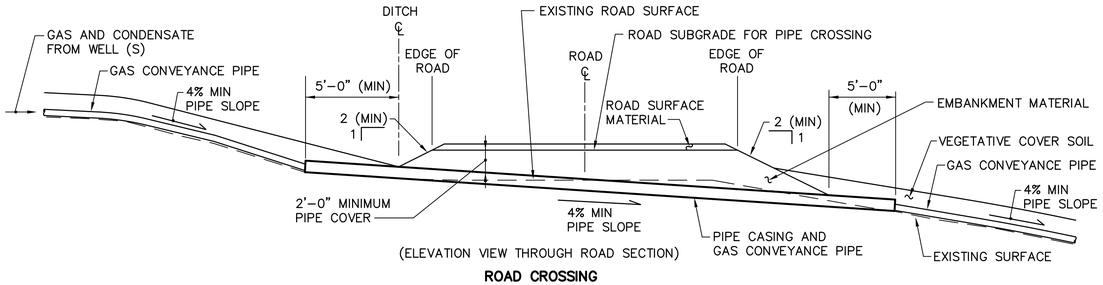
PIPE TRENCH – TYPE 2

DETAIL 2 C–

SCALE: NTS

NOTES:

1. ALL ELASTOMERIC SEALS (e.g., GASKETS, O–RINGS, ect.) SHALL BE NITRILE OR VITON.
2. ALL PVC PIPE SHALL BE SCHEDULE 80 UNLESS NOTED OTHERWISE.
3. ALL HDPE PIPE SHALL BE SDR 17.0 UNLESS NOTED OTHERWISE.
4. HDPE PIPE JOINTS SHALL BE THERMAL BUTT FUSION WELDED UNLESS NOTED OTHERWISE. ELECTRO–FUSION FITTINGS & FLANGES ARE NOT ALLOWED UNLESS NOTED OTHERWISE OR AUTHORIZED BY OWNER.

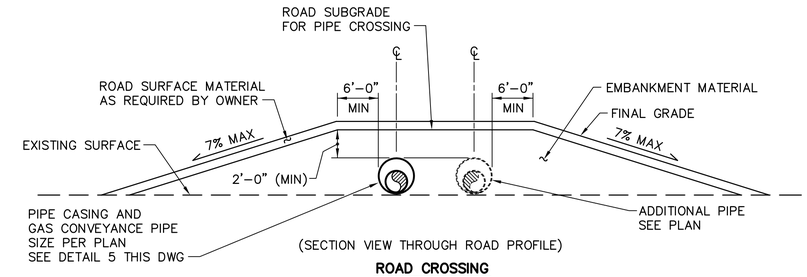


(ELEVATION VIEW THROUGH ROAD SECTION)

ROAD CROSSING

DETAIL 3 C–

SCALE: NTS

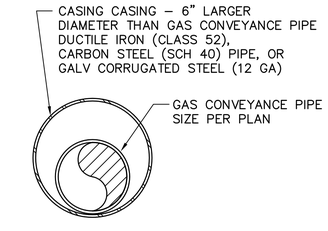


(SECTION VIEW THROUGH ROAD PROFILE)

ROAD CROSSING

DETAIL 4 C–

SCALE: NTS



ROAD CROSSING SLEEVE

DETAIL 5 C–

SCALE: NTS

NOT FOR CONSTRUCTION
REVIEW SUBMITTAL

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PROJ. NO.	07207006.10	DWN. BY:	LEL	ACAD FILE:	C9
DSN. BY:	TAM	CHK. BY:	TAM	APP. BY:	JMR

DATE: JULY 2011

SCALE: AS SHOWN

DRAWING NO. C9