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From: Beth Landale/CRA

Re: AIR Methane Investigation Summary Pontiac North Campus Pontiac, Michigan Date: 7/15/2005

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This memorandum summarizes the activities performed to investigate and delineate methane levels within the Area of Industrial Redevelopment (AIR) at Pontiac North Campus (Site) located in Pontiac, Michigan. The purpose of the investigation was to determine if methane is present in the AIR and to delineate the extent of methane beneath the proposed United States Postal Service (USPS) building footprint.

BACKGROUND

The USPS has identified concerns related to the potential for methane production from the historic fill areas within the AIR. The initial investigation monitored for the presence of methane in areas where historic filling activities were known to have occurred at the Site. Based on the initial results it was observed that the only methane readings coincided with the location of light non-aqueous phase liquid (LNAPL) present in LNAPL Areas Nos. 1, 2, and 7. The investigation was expanded to assess the presence of methane in wells installed within the LNAPL Areas 1, 2, 3, 7, 9, and 10. Methane was observed during the expanded investigation in LNAPL Areas Nos. 3, 9, and 10. Additional work was completed to confirm the methane levels detected and to verify whether anaerobic conditions were present in the subsurface. Delineation activities were completed within the footprint of the proposed USPS building to delineate methane beneath the proposed building.

The Scope of Work (SOW) for the methane investigations were presented in the following work plan memoranda:

- Area of Industrial Redevelopment (AIR) Methane Investigation Work Plan (EEC, March 17, 2005); and
- Draft AIR Methane Investigation Work Plan Addendum No.1 (EEC, June 24, 2005).

Methane monitoring procedures were completed consistent with the work plans. The scope of the investigations and the results are further discussed in the following sections.

SUMMARY OF ACTIVITIES

Initial Investigation

Two temporary soil gas probes (BW9-100 and BW9-101) were installed on March 17, 2005 to determine the presence and concentration of methane gas within the fill beneath the proposed building. Figure 1

presents the locations of the soil gas probes. The probes were constructed as indicated in Figure 2, with the bottom one foot of the screen located in the water table.

Four existing monitoring wells (MW39-99, MWW1-10, MWW1-12, and MW-11) located in the western area of the AIR (Grid areas E13, F11, and F10) were also used to monitor for methane within areas of fill located west of the proposed building. These monitoring wells had at least five feet of screen above the water table. The J-caps were replaced with stopcock and hose barb assemblies for gas monitoring. The locations of the existing monitoring wells and soil gas probes used to monitor methane are presented on Figure 1.

The probes and monitoring wells were monitored five days following the installation of the probes to allow pressure and methane to accumulate in the wells. Carbon dioxide (CO_2) , oxygen (O_2) , and methane gas measurements were obtained with a Landtec GA-90. The measured gas content was expressed as the equivalent percent methane by volume in air. Monitoring of the gage pressure at the monitoring locations was achieved using a digital manometer. The results of the initial monitoring are presented on Table 1.

Based on the initial results, additional monitoring was completed to verify the results and to evaluate the potential for methane in other areas of the AIR, specifically in the areas of the LNAPL pools. The monitoring included CO₂, O₂, methane, and pressure at eight additional monitoring wells in LNAPL Areas No. 3, 9, and 10 (MWW8-16, MWW8-29, MWW8-30, MWW8-33, MWW8-34, MWW8-51, MWW8-55, and MWW8-59) located in Grid areas A7, B8, B10, C6, C9, C10, and C11. The locations of these monitoring wells are presented on Figure 1. The gas measurements for the monitoring wells and soil gas probes are presented in Table 1.

Additional Work

Due to the presence of LNAPL in several of the wells where elevated methane readings were recorded, a field screening test was completed on May 4, 2005 to determine if volatile organic compounds (VOCs) could be interfering with the Landtec GA-90 meter. The wells were purged and initial methane readings were obtained. A small charcoal filter was then placed between the tubing and the Landtec GA-90 intake to remove/reduce any VOCs from the gas stream. The well/probe was purged for several more minutes to determine if the methane level measured by the Landtec GA-90 changed at all. No significant changes were observed. It did not appear that VOCs were interfering with the methane measurements.

To verify the methane concentrations measured using the Landtec GA-90, soil gas samples were collected and submitted to a local laboratory for methane analysis. Soil gas samples were collected from monitoring wells MWW1-12, MW-11, MWW8-29, MWW8-30, and MWW8-34 on May 31, 2005. Samples were collected using a portable air sampling pump and 1 liter laboratory supplied tedlar bags. The tedlar bags were filled three times at a pumping rate of 1 L/min to purge the well prior to collecting the sample for analysis. The samples were analyzed for methane using U.S. EPA Method SW846 8015 modified for air sample analysis. The results of the laboratory analysis confirmed the field measurement data. Table 2 summarizes the laboratory data and the associated field data collected on May 31, 2005, the date the laboratory samples were collected.

Based on the results of the initial and additional investigations, the cause of the methane production in the LNAPL areas is believed to be a result of anaerobic biodegradation of the LNAPL. To determine if the subsurface conditions favor the anaerobic biodegradation of LNAPL, groundwater parameters were

monitored including temperature, conductivity, dissolved oxygen, pH, and oxidation-reduction potential in 16 wells in the AIR. Groundwater was purged from each of the 16 monitoring wells using low-flow sampling protocol. Field parameter measurements were collected every five minutes until stabilization was achieved. The results generally indicate that subsurface (groundwater) conditions are anaerobic in the AIR. Four wells showed aerobic conditions. Two of these wells are located within the active area of the LNAPL No. 3 extraction system; one to the east, outside the extent of LNAPL Area No. 3; and one on the western edge of LNAPL Area 3 extended. The aerobic conditions, observed within the LNAPL No. 3 extraction area result from the injection of air as part of the removal process. Table 3 presents the field parameter results.

Addendum No. 1

To delineate methane gas beneath the rest of the proposed USPS building footprint, several soil gas probes were installed on June 27, 2005. Two soil gas probes (GPW9-01 and GPW9-02) were proposed to determine the presence and magnitude of methane gas beneath the southern and eastern portion of the proposed building footprint. The soil boring completed at the GPW9-01 location revealed dry clay from ground surface to 30 feet below ground surface, therefore a probe was not installed consistent with the Draft AIR Methane Investigation Work Plan, Addendum No. 1. An additional four soil gas probes (GPW9-03 through GPW9-06) were installed south of LNAPL Area No. 3 to delineate methane and migration potential beyond the footprint of LNAPL Area No. 3. An existing monitoring well (MWW8-26) with approximately 3.5 feet of screen above the water table in grid area C5, was used to monitor for methane east of LNAPL Area No. 3. The proposed USPS building footprint overlies the former Plant 6 Central Foundry location. The former Foundry included two large basements, which are located in grid areas E6 though E8 and F6 through F8. Soil gas probes were not installed within the former basement footprint as the materials contained in the basements are being removed. Figure 1 presents the locations of the additional soil gas probes and monitoring wells used to monitor for methane. The results of the methane delineation monitoring are presented in Table 1.

A methane reading of 3.3% by volume was observed at GPW9-02 during the third round of monitoring (five days following installation). Initial methane measurements recorded at GPW9-02 and subsequent readings did not detect methane. The 3.3% detection at GPW9-02 may be an anomaly.

Due to the active construction of the preload pile and the presence of an access road in the area, the four soil gas probes installed to delineate methane south of LNAPL Area No. 3 were installed further south than originally proposed. The additional methane monitoring beneath the building footprint indicated that methane was not present and was not migrating from LNAPL Area No. 3.

DISCUSSION

Based on the results of the monitoring, the fill material at the Site is not suspected to be a potential source of the methane. The methane production is related to the anaerobic biodegradation of the LNAPL present within the AIR. The additional methane monitoring below the proposed building footprint indicated that methane was not present beneath the building outside LNAPL Area No. 3 and was not migrating horizontally from LNAPL Area No. 3.

To evaluate the significance of the methane readings observed, the Michigan Department of Environmental Quality (MDEQ) Part 115, Act 451 Rule 299.4433 was used which regulates explosive gas control from

Type II landfills. This rule states that methane concentrations must remain below 25% of lower explosive limit (LEL). The LEL for methane is 5% by volume, therefore the screening criteria for this evaluation is 1.25% by volume of methane. The levels observed beneath the proposed building footprint are below this criterion, with the exception of the area directly above LNAPL Area No. 3.

It should be noted that previous soil borings completed by GM and USPS (i.e. McDowell) south and southeast of LNAPL Area No. 3 indicate that the geology is primarily lower permeability clays and silts and that a water bearing zone within more transmissive soils (e.g. sands) is not present. Based on the evaluation completed and the low permeability soils located beneath the proposed USPS building footprint, methane is not present beneath the building outside LNAPL Area No. 3 and has a low potential for horizontal migration.

The continued recovery of free phase LNAPL from this area will further decrease the amount of LNAPL remaining in the subsurface and will also decrease the amount of methane being generated.

Methane is present at significant levels in LNAPL Areas Nos. 1, 2, 9, and 10, located in the AIR due to the anaerobic degradation of LNAPL in these areas. These areas are not located under the proposed USPS building footprint. Passive venting of methane in these areas can be easily accomplished.

SUMMARY

Based on data collected to-date, the methane detected in the AIR is a byproduct of anaerobic biodegradation of LNAPL located in the area. Based on the lower permeability clays and silts south of the LNAPL Area No. 3 and the lack of methane readings recorded from the gas probes installed within the building footprint, the methane produced in LNAPL Area No. 3 is not expected to migrate horizontally beneath the USPS building.

Engineering controls should be effective at managing methane production from residual LNAPL in the subsurface within the AIR.





TABLE 1 SOIL GAS FIELD MEASUREMENTS METHANE INVESTIGATION SUMMARY PONTIAC NORTH CAMPUS PONTIAC, MICHIGAN

Well ID	Date	Pressure	CH _{4 (%)}	CO _{2 (%)}	O _{2 (%)}	Notes
LNAPL Areas N	o. 1, 2, and 7					
MW39-99	3/23/05	0.04	2.9	4.1	0.0	
	3/24/05	0.03	2.4	3.2	2.4	
	4/4/05		2.1	1.9	4.9	
	4/14/05		3.7	2.3	0.2	
	4/15/05	0.01	3.1	2.2	5.6	
	5/4/05	-0.65	0.3	0.0	22.0	
	5/19/05	0.12	1.0	1.9	7.7	
MWW1-10	3/23/05	0.00	0.0	0.0	19.8	
	3/24/05	0.02	0.0	0.0	20.1	
	4/4/05		0.0	0.0	19.8	
	4/14/05		0.3	0.1	19.1	
	4/15/05	-0.001	0.1	0.3	22.1	
	5/4/05	-0.535	0.3	0.0	22.6	
	5/19/05	-0.33	0.0	0.1	20.4	
MWW1-12	3/23/05	0.05	11.3	0.0	0.9	
	3/24/05	0.05	10.5	0.0	1.9	
	4/4/05		5.5	0.0	0.8	
	4/14/05		2.4	0.0	0.3	
	4/15/05	0.01	1.8	0.3	0.4	
	5/4/05	-0.710	1.2	0.0	4.2	
	5/19/05	-0.270	16.1	0.0	0.0	
	5/31/05		9.0	0.07	0.87	
MW-11	3/23/05	0.07	11.8	4.1	0.6	
	3/24/05	0.03	10.5	4.2	0.5	
	4/4/05		6.6	5.3	0.3	
	4/14/05		2.3	6.4	0.4	
	4/15/05	0.001	0.0	7.1	5.2	
	5/4/05	-0.385	9.8 (12.8)	6.2	0.0	
	5/4/05	-0.385	7.4	5.6	0.1	(charcoal)
	5/19/05	-0.41	16.1	5.4	0.0	
	5/31/05		11.0	6.5	0.7	
BW9-100	3/23/05	0.01	0.0	4.9	5.0	
	3/24/05	0.00	0.0	4.3	6.2	
	4/4/05		0.0	3.9	10.8	
	4/15/05	0.02	0.1	5.8	8.5	
	5/4/05	-0.284	0.0	4.4	10.7	
	5/4/05	-0.284	0.0	4.9	8.7	(charcoal)
	5/17/05	-0.740	0.2	5.3	9.7	
BW9-101	3/23/05	0.01	0.0	2.5	0.0	
	3/24/05	0.00	0.0	2.5	5.1	
	4/4/05		0.0	2.5	0.1	
	4/15/05	0.01	0.1	3.5	0.0	
	5/4/05	-0.655	0.3	3.7	0.0	
	5/17/05	-0.060	0.3 (0.4)	3.6	0.0	
	5/19/05	0.010	0.0	3.2	0.0	

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Well ID	Date	Pressure	CH _{4 (%)}	CO _{2 (%)}	O _{2 (%)}	Notes
LNAPL Areas No	o. 3, 9, and 10					
MWW8-16	4/18/05	-39 40	03	0.0	21.5	LNAPL Recovery System - operating
1010000010	5/4/05	-25.05	0.3	23	16.3	INAPI Recovery System - operating
	5/19/05	-0.01	0.6	0.0	21.0	INAPL Recovery System - operating
	6/7/05	-0.01	5.8	9.7	0.1	LNAPL Recovery System - not operating
	, ,					5 5 1
MWW8-29	4/18/05	0.01	23.3	6.0	0.0	
	5/4/05	-0.003	1.2	0.3	21.3	
	5/19/05	-0.030	17.8	5.8	0.8	
	5/31/05		66.0	11.2	0.0	
MWW8-30	4/18/05	0.10	71.0	7.3	5.1	
	5/4/05	-0.02	56.0	7.0	5.7	
	5/4/05	-0.02	57.7	5.8	6.3	(charcoal)
	5/19/05	-0.01	10.8	1.2	18.5	()
	5/31/05		43.3	5.1	9.6	
MMMM 22	4/18/05	1.05	0.0	26	16.8	
10100 000-33	5/4/05	0.526	0.9	2.0	10.0	
	5/4/05 E/10/0E	0.336	1.0	4.4	15.1	
	5/19/05	0.200	0.2	4.1	10.1	
MWW8-34	4/18/05	0.11	70.0	4.4	0.0	
	4/19/05	0.09	72.0	4.5	0.0	
	5/4/05	-0.01	58.9	4.9	0.0	
	5/4/05	-0.01	58.9	4.2	0.0	(charcoal)
	5/19/05	0.04	57.8	4.5	0.0	· · · ·
	5/31/05	-0.008	58.1	4.4	0.0	
MM/M/8 51	4/18/05	0.02	0.2	0.0	21.5	
1010000-01	$\frac{4}{10}$	0.02	0.2	0.0	21.5	
	5/4/05	0.02	0.2 (0.0)	0.0	22.5	
	5/19/05	0.05	0.0	0.0	21.5	
MWW8-55	4/18/05	0.04	35.6	2.4	1.6	
	5/4/05	0.02	33.3	3.3	1.9	
	5/4/05	0.02	32.8	3.0	2.1	(charcoal)
	5/20/05	0.00	28.1	4.6	0.8	
MWW8-59	4/18/05	-0.01	01	0.0	21.3	
1111111000	5/4/05	0.02	0.2	0.0	22.0	
	5/19/05	0.01	0.0	0.0	21.8	
Other LNAPL A	rea No. 3		0.4	0.0		
MILE INIADIT 1	4/20/05		0.4	0.0		
LINAPL Lank	5/4/05		0.4 (0.8)	0.0	18.9	INADI Deserver Creations and the
NVV VV 0-13	0///UD		1.4	0.2	19.8	LINAFL Recovery System - not operatin
INVV VVO-22	6/7/05		0.1	0.0	20.8	LINAPL Recovery System - not operatin
NVV VV 0-32	6/7/05 6/7/05		0.5	0.1	20.3 19.6	LINAPL Recovery System - not operatin
1.11110-20	0///05		0.6	0.6	10.0	LINAFL Recovery System - not operatif

TABLE 1 SOIL GAS FIELD MEASUREMENTS METHANE INVESTIGATION SUMMARY PONTIAC NORTH CAMPUS PONTIAC, MICHIGAN

Well ID	Date	Pressure	CH4 (%)	CO _{2 (%)}	O _{2 (%)}	Notes				
<u>Building Footpr</u>	Building Footprint									
MWW8-26	6/28/2005 6/29/2005 7/1/2005 7/5/2005 7/8/2005	14.58 - - - -	0.0 0.0 0.2 0.0 0.0	2.8 2.1 (2.7) 1.5 1.6 1.5	10.2 15.6 19.0 18.4 18.6					
GPW9-02	6/28/2005 6/29/2005 7/1/2005 7/5/2005 7/8/2005	0.00 -0.14 0.02 -0.07 -0.05	0.0 0.0 (0.3) 3.3 0.0 0.0	1.0 2.2 (2.3) 1.7 2.4 2.5	19.3 14.5 13.1 13.5 13.8					
GPW9-03	6/28/2005 6/29/2005 7/1/2005 7/5/2005 7/8/2005	-0.03 -0.01 0.00 -0.08 0.00	0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0	20.3 19.3 15.9 1.0 0.9					
GPW9-04	6/28/2005 6/29/2005 7/1/2005 7/5/2005 7/8/2005	0.01 -0.03 0.01 -0.07 -0.06	0.0 0.0 0.3 0.0 0.0	$0.4 \\ 0.3 \\ 6.1 \\ 5.1 \\ 4.4$	19.1 19.3 0.3 0.5 0.6					
GPW9-05	6/28/2005 6/29/2005 7/1/2005 7/5/2005 7/8/2005	-0.01 -0.20 0.03 -0.15 0.01	0.0 0.0 0.2 0.0 0.0	0.0 0.0 0.0 0.0 0.0	9.2 6.3 2.1 3.2 4.0					
GPW9-06	6/28/2005 6/29/2005 7/1/2005 7/5/2005 7/8/2005	0.08 -0.20 0.07 -0.05 0.04	$\begin{array}{c} 0.0 \ (0.1) \\ 0.0 \\ 0.3 \\ 0.0 \\ 0.0 \end{array}$	2.6 2.7 3.0 2.8 2.8	0.0 0.0 0.6 0.0 0.0					

Notes:

% Percent by volume in air

CO₂ Carbon dioxide

 CH_4 Methane

O₂ Oxygen

- MPE Multiple Phase Extraction System -- No reading collected, manometer or Landtec-90 not available or functioning.(#) Indicates a concentration spike observed
- (iii) Indicates a concentration of the verse real during the purging of the well (charcoal) The air purged from the well was pumped through a charcoal filter before the Landtec-90 Negative pressure in some cases may be due to the Multi-Phase Extraction System nearby

TABLE 2 LABORATORY RESULTS METHANE INVESTIGATION SUMMARY PONTIAC NORTH CAMPUS PONTIAC, MICHIGAN

		CH _{4 (%)}				
Well ID	Date	Field Reading	Laboratory			
MWW1-12	5/31/05	9.0	10			
MW-11	5/31/05	11.0	11			
MWW8-29	5/31/05	66.0	62/52			
MWW8-30	5/31/05	43.3	48			
MWW8-34	5/31/05	58.1	58			

Notes:

% Percent by volume in air

CH₄ Methane

62/52 Sample Result/Duplicate Result

TABLE 3 GROUNDWATER FIELD PARAMETERS METHANE INVESTIGATION PONTIAC NORTH CAMPUS PONTIAC, MICHIGAN

Wall Code	Time	Purge Rate	Water Level	Temperature	Conductivity	DO	H	OPP(mV)
Well Coue	Interval	(mL/min)	(feet BTOR)	(°C)	(mS/Cm)	(mg/L)	hn	OKr (mv)
MW-11	11:27	100	17.20	11.32	1.051	8.39	7.16	-86
	11:32	100	17.21	11.93	1.052	8.14	7.14	-86
	11:37	100	17.21	12.12	1.052	8.16	7.14	-87
	Note: large am	ount of bubbles in tub	ing					
MW39-99	14:54	100	26.65	13.97	0.956	0.37	7.91	-153
	14:59	100	26.65	13.50	0.955	0.24	8.04	-167
	15:04	100	26.65	13.40	0.945	0.19	8.13	-181
	15:09	100	26.65	13.54	0.939	0.18	8.17	-191
	15:14	100	26.65	13.44	0.936	0.15	8.24	-197
	15:19	100	26.65	13.57	0.934	0.12	8.27	-202
	15:24	100	26.65	13.63	0.933	0.12	8.27	-205
	15:29	100	26.65	13.59	0.933	0.11	8.30	-207
	15.04	100	20.70		1 1 50	0.04	7.04	
MWW1-10	15:01	100	30.60	13.12	1.172	0.34	7.24	-128
	15:06	100	30.81	13.12	1.145	0.19	7.19	-131
	15:11	100	31.00	13.33	1.137	0.14	7.19	-134
	15:16	100	31.24	13.33	1.138	0.11	7.20	-138
	15:21	100	31.41	13.33	1.144	0.09	7.21	-139
1	15:26	100	31.60	13.48	1.149	0.08	7.23	-142
	15:31	100	31.72	13.47	1.165	0.07	7.27	-144
NATA/1_12	11.45	100	17 02	10.28	0 355	0.36	11 17	93
10100 00 1-12	11.40	100	17.02	10.20	0.358	0.50	11.17 11.17	-50
	11.50	100	17.00	10.49	0.330	0.20	11.17	-50
1	12.00	100	17.00	10.47	0.365	0.52	11.10	-107
1	12:00	100	17.00	10.55	0.305	0.20	11.17	-111
1	12:05	100	16.99	10.59	0.365	0.24	11.16	-114
	12:10	100	16.99	10.66	0.365	0.24	T1.14	-117
MWW8-30	11.30	100	11 19	14 23	512	0.45	6.50	-82
101000000	11.35	100	11.17	13.47	5.15	0.33	6 51	-84
	11.33	100	11.12	14.18	5 14	0.33	6.52	-85
	11.45	100	11.19	14.10	5.14	0.01	6.54	-03
	11.40	100	11.17	14.14	5.15	0.20	0.04	-07
	11.50	100	11.19	13.47	5.15 5.17	0.24	6.34 (E4	-0/
	11:55	100	11.17	15.52	3.17	0.22	0.34	-87
MWW8-33	17:13	100	20.46	12.71	5.24	0.12	7.64	-132
	17:18	100	20.47	12.77	5.24	0.12	7.65	-134
	17:23	100	20.48	12.72	5.23	0.12	7.64	-137
MWW8-34	16:30	100	18.15	12.16	4.47	0.11	7.10	-185
	16:35	100	18.15	12.36	4.45	0.10	7.10	-194
	16:40	100	18.15	12.38	4.44	0.08	7.10	-200
	16:45	100	18.15	12.41	4.43	0.08	7.11	-205
	16:50	100	18.15	12.40	4.43	0.07	7.11	-210
	14.00	100	15 50	12.20	1.02	0.02	7.02	110
MWW8-35	14:38	100	15.53	13.29	1.93	0.23	7.02	-110
1	14:43	100	15.53	13.06	1.91	0.19	7.05	-113
1	14:48	100	15.53	13.01	1.93	0.18	7.06	-115
	14:53	100	15.53	13.08	1.94	0.15	7.08	-117
	14:58	100	15.53	12.92	1.95	0.14	7.10	-121
	15:03	100	15.53	13.08	1.95	0.13	7.10	-122
MMMM8_37	11.78	100	20.18	13 17	2.06	0.33	7 20	140
10100 000-37	11.20	100	20.10	13.17	2.00	0.55	7.20	-140
	11.33	100	20.10	13.30	2.00	0.22	7.25	-145
	11.30	100	20.10	13.34	2.07	0.21	7.25	-147
	11:45	100	20.10	13.20	2.07	0.19	7.20	-150
	11:40	100	20.18	13.07	2.07	0.10	7.20	-152
	11:55	100	20.18	13.07	2.07	0.10	7.20	-152
	11:58	100	20.18	13.10	2.07	0.15	7.28	-152

TABLE 3 GROUNDWATER FIELD PARAMETERS METHANE INVESTIGATION PONTIAC NORTH CAMPUS PONTIAC, MICHIGAN

Well Code	Time Interval	Purge Rate (mL/min)	Water Level (feet BTOR)	Temperature (°C)	Conductivity (mS/Cm)	DO (mg/L)	pН	ORP (mV)
MWW8-45	14:35	100	20.52	14.11	1.61	0.65	6.83	-228
	14:40	100	20.52	13.60	1.61	0.27	6.85	-237
	14:45	100	20.52	13.51	1.60	0.18	6.86	-247
	14:50	100	20.52	13.50	1.60	0.13	6.87	-219
	14:55	100	20.52	13.52	1.59	0.11	6.87	-251
	15:00	100	20.52	13.51	1.59	0.09	6.88	-254
	15:10	100	20.52	13.42	1.59	0.08	6.88	-257
	15:20	100	20.52	13.34	1.59	0.07	6.89	-261
	15:30	100	20.52	13.75	1.58	0.06	6.89	-266
	15:35	100	20.52	13.78	1.58	0.05	6.89	-268
	15:40	100	20.52	14.13	1.58	0.05	6.89	-268
MWW8-59	17:28	100	26.38	14.24	1.14	0.51	6.63	-48
	17:33	100	26.38	14.18	1.14	0.47	6.63	-49
	17:38	100	26.38	14.26	1.145	0.42	6.63	-53
	18:43	100	26.38	14.30	0.991	0.41	6.64	-55
MWW8-26	10:25	100	14.73	12.67	1.423	4.64	6.47	234
	10:30	100	14.73	12.93	1.424	4.43	6.58	226
	10:35	100	14.73	12.17	1.426	4.67	6.60	222
	10:40	100	14.73	11.61	1.424	5.08	6.62	219
	10:45	100	14.73	11.70	1.425	5.12	6.64	215
	Note: located o	outside of and east of L	NAPL Area No. 3					
MWW8-51	15:15	200	5.99	13.93	1.294	1.19	6.70	-83
	15:20	200	5.99	13.82	1.293	0.64	6.73	-98
	15:30	200	5.99	14.73	1.296	0.42	6.77	-107
	15:35	200	5.99	14.62	1.295	0.38	6.79	-110
	15:40	200	5.99	14.81	1.305	0.33	6.79	-113
	15:45	200	5.99	14.64	1.313	0.30	6.78	-115
MWW8-53	12:05	200	20.74	15.30	1.64	3.24	6.51	161
	12:10	200	20.74	14.96	1.63	2.02	6.62	146
	12:15	200	20.74	14.41	1.62	2.65	6.63	137
	12:20	200	20.74	14.85	1.63	2.53	6.63	128
	12:25	200	20.74	15.09	1.63	2.4	6.64	119
	12:30	200	20.74	14.61	1.64	2.36	6.65	112
	12:35	200	20.74	14.73	1.64	2.36	6.65	105
	12:40	200	20.74	15.12	1.64	2.35	6.66	100
	12:45 Note: located o	200 m western edge of LNA	20.74 APL Area No. 3	15.20	1.64	2.35	6.65	97
RWW8-32	10:00	500	31.10	14.16	1.333	1.13	6.73	54
	10:05	500	31.10	15.61	1.315	0.62	6.79	27
	10:10	500	31.10	15.72	1.315	0.57	6.8	20
	10:15	500	31.10	15.77	1.328	0.54	6.83	22
	10:20	500	31.10	15.88	1.329	0.53	6.83	25
	10:25	500	31.10	15.84	1.330	0.47	6.84	27
	Note: located u	vithin LNAPL Area N	lo. 3 active remediation area					
RWW8-14	13:15	500	31.20	14.26	1.165	4.71	7.85	103
	13:20	500	31.20	15.25	1.192	3.59	7.90	101
	13:25	500	31.20	15.51	1.175	3.15	7.92	100
	13:30	500	31.20	15.76	1.171	2.92	7.93	100
	13:35	500	31.20	15.93	1.181	2.74	7.92	99
	Note: located w	vithin LNAPL Area N	lo 3 active remediation area					

Notes:

BTOR Below Top of Riser

DO Dissolved Oxygen ORP Oxidation Reduction Potential Measurements collected in May 2005.