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Ms. Brenda Brouillet
District Supervisor
Remediation and Redevelopment Division
Michigan Department of Environmental Quality
503 North Euclid Avenue
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Bay City, Michigan 48706-2965

INDUSTRIAL

Subject:
REALM Peninsula Area Property, Saginaw, Michigan

Date:
July 24, 2007

Contact:
Lisa Coffey

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Our ref:
B0086991 #2.04

Dear Ms. Brouillet:

This letter, submitted on behalf of the General Motors Corporation (GM), presents the results of supplemental groundwater sampling for selenium, completed in the Plant 2 Peninsula Area and adjacent areas, located in Saginaw, Michigan. As discussed in a letter dated January 6, 2006, from GM to the Michigan Department of Environmental Quality (MDEQ), the purpose of the additional sampling was to confirm that the detected concentrations of selenium in groundwater in the southern part of the Peninsula Area property do not pose a threat to surface water. The proposed sampling program was approved by the MDEQ in a letter dated April 10, 2006, and was completed in October 2006. Please note that data reporting has been delayed in an effort to coordinate with submittal of groundwater quality data collected by Delphi Automotive (Delphi); however, the more extensive investigation activities completed by Delphi are still ongoing, and it was determined based on the analytical results that the data could be evaluated independently. Note that the data will also be evaluated with the Delphi data as it becomes available.

On October 10 and 11, 2006, groundwater samples were collected from 11 on-site monitoring wells (MW04-121WT, MW04-121S1, MW-144WT, MW97-105WT, MW97-105S1, MW04-124WT, MW04-124S1, MW04-123WT, MW04-123S1, TW98-109WT, and MW98-109S1) using low-flow purge and sampling methods and submitted for analysis of total and dissolved selenium. In addition, two surface-water samples were collected and submitted for analysis of total selenium.

Groundwater elevation measurements (Table 1) were collected from the monitoring wells listed above and from select off-site monitoring wells prior to the start of groundwater sampling activities. Each well was purged prior to sampling until the pH, temperature, specific conductance, turbidity, and dissolved oxygen values reached stability (Table 2). Surface-water samples were collected as grab samples from the locations shown on Figure 1. Quality control samples, consisting of one duplicate, one matrix spike and one matrix spike duplicate, were also collected and submitted for laboratory analysis. All samples were submitted to Severn Trent Laboratories, located in North Canton, Ohio, for analysis. The data were validated, as described in the attached memorandum.

Selenium was detected in the total or dissolved groundwater samples collected from 10 of the 11 monitoring wells and in both surface-water samples. The analytical data are shown in Table 3 and also on Figure 1. The detected selenium concentrations are all well below the MDEQ Part 201 criteria for Residential Drinking Water, Industrial Drinking Water, and Groundwater Contact. The Groundwater Surface Water Interface (GSI) Criterion of 5 micrograms per liter (µg/L) was exceeded in total and dissolved samples collected from five monitoring wells, located south and east of the wetland, at concentrations ranging from, 5.5 µg/L at monitoring well MW04-121WT to 18.4 µg/L at monitoring well MW04-121S1. Selenium concentrations were below the GSI criterion in all of the monitoring wells located closest to the wetland.

Selenium was detected at concentrations above MDEQ Rule 57 Water Quality Values in both of the surface water samples (Wetland-01 and Wetland-02), collected on the adjoining REALM property, at concentrations of 6.5 µg/L and 7.3 µg/L, respectively (Table 4). The concentrations detected in surface water are four to eight times greater than the concentrations detected in the up-gradient groundwater monitoring locations (TW98-109WT, MW98-109S1, MW04-123WT, and MW04-123S1) located on the Peninsula Area property. The October 2006 data confirm the results of previous groundwater and surface-water sampling events, and further support that the detected concentrations of selenium in groundwater in the southern part of the Peninsula Area property, adjacent to the wetland surface water, do not exceed the GSI criterion for selenium.

Based on these results, we recommend that no further actions be taken.

Sincerely,

ARCADIS of New York, Inc.

Lisa Coffey
Senior Geologist II

Attachments:
Table 1 — Groundwater Elevation Data, October 9, 2006
Table 2 — Field Parameter Data
Table 3 — Groundwater Analytical Results – Total and Dissolved Selenium
Table 4 — Surface Water Analytical Results
Figure 1 — Groundwater and Surface Water Quality Data and Water Table Elevation Contour Map – October 9, 2006
Data Quality Assessment and Validation Memorandum

Copies:
Ms. Rhonda Klann, MDEQ
Mr. William Willard, Delphi Automotive
Mr. Dale Thrush, Delphi Automotive
Ms. Cheryl Hiatt, GM WFG
Mr. Edward Peterson, GM WFG
Anthony Thrubis, Esq., GM Legal
Mr. Douglas Saigh, MACTEC

Table 1. Groundwater Elevation Data, October 9, 2006
REALM Inc., Peninsula Area Property, Saginaw, Michigan

Location I.D.	Top of Casing Elevation (ft msl)	Depth to Water from Top of Inner Casing (feet)	Groundwater Elevation (ft msl)
MW01-118WT	594.44	NA	NA
MW01-119S1	595.92	9.27	586.65
MW04-118S1	596.21	NA	NA
MW-04-119WT	596.24	6.68	589.56
MW04-121S1	596.45	11.09	585.36
MW04-121WT	596.45	9.51	586.94
MW-04-122S1	596.12	NA	NA
MW-04-122WT	595.84	NA	NA
MW04-123S1	595.34	9.32	586.02
MW04-123WT	595.5	9.17	586.33
MW04-124S1	591.91	5.76	586.15
MW04-124WT	591.68	5.51	586.17
MW-129	588.78	2.86	585.92
MW-143WT	598.05	8.35	589.70
MW-144WT	594.93	7.60	587.33
MW97-104S1	595.01	NA	NA
MW97-104WT	595.44	NA	NA
MW97-105S1	594.94	8.33	586.61
MW97-105WT	595.42	8.84	586.58
MW98-108S1	595.7	NA	NA
MW98-109S1	594.71	8.21	586.50
MW98-110S1	594.25	NA	NA
MW98-111S1	595.13	NA	NA
TW98-108WT	594.95	NA	NA
TW98-109WT	594.63	8.33	586.30
TW98-110WT	595.13	NA	NA
TW98-111WT	595.25	NA	NA
X-1A	599.1	11.91	587.19
X-1B	599.07	11.38	587.69
X-20	NA	NA	NA

Notes:
1. NA = Not available.

Table 2. Field Parameter Data
REALM Inc., Peninsula Area Property, Saginaw, Michigan

Well ID	Date Sampled	pH (SU)	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Turbidity (NTUs)
MW-04-118S1	9/16/2004	6.88	17.92	6.244	0.12	-116.9	5.29
MW-129	9/17/2004	6.66	13.72	1.943	0.33	-91.9	7.97
MW-144WT	9/15/2004	6.78	19.7	1.878	0.08	-166.2	9.65
MW-144WT	12/21/2004	6.84	9.02	1.776	0.26	NA	15.3
MW-97-104S1	9/16/2004	7.02	15.43	4.273	0.3	-131.3	1.52
MW-97-104WT	9/16/2004	7.32	16.02	1.754	0.03	-156.1	1.76
MW-97-105S1	9/15/2004	6.56	15.67	2.656	0.17	-97.6	2.71
MW-97-105S1	12/21/2004	6.64	9.85	2.872	0.3	NA	0.86
MW-97-105WT	9/15/2004	6.61	17.1	2.635	1.28	-122.5	4.63
MW-97-105WT	12/21/2004	7.10	10.45	1.818	0.19	NA	4.03
TW98-108WT	9/15/2004	7.11	16.93	0.857	0.11	-152.9	3.47
MW-98-108S1	9/15/2004	6.70	15.96	3.413	0.52	-101.7	1.95
TW98-109WT	9/15/2004	6.87	16.86	2.598	0.34	-121	6.18
MW-98-109SI	9/15/2004	6.79	15.82	3.845	0.17	-128.9	1.76
MW-98-110S1	9/17/2004	7.28	14.94	1.776	0.25	-146	4.86
MW-98-110WT	9/17/2004	7.31	15.57	1.739	0.31	-137.4	5.94
MW-98-111S1	9/17/2004	6.83	14.01	4.464	0.16	-130	9.98
MW-98-111WT	9/17/2004	8.31	14.84	3.047	0.23	-106.2	6.94
MW-01-118WT	9/16/2004	7.19	16.3	2.922	0.3	-112.6	2.12
MW-04-119WT	9/16/2004	7.30	20.58	1.501	0.11	-189.7	9.87
MW-04-119WT	12/22/2004	7.54	8.7	0.91	0.26	NA	16.1
MW-01-119S1	9/16/2004	6.99	16.19	1.883	0.07	-125.2	9.53
MW-01-119S1	12/22/2004	7.15	7.4	1.17	0.42	NA	9.61
MW-04-121WT	9/16/2004	7.98	16.97	1.087	0.18	-220.4	7.22
MW-04-121WT	12/21/2004	9.93	10.15	1.351	0.05	NA	2.67
MW-04-121S1	9/16/2004	6.77	15.95	2.842	0.18	-87.9	9.71
MW-04-122WT	9/16/2004	7.05	16.42	4.546	0.19	-83.7	8.75
MW-04-122S1	9/16/2004	6.67	15.73	9.032	0.12	-90	9.74
MW-04-123WT	9/16/2004	6.72	15.7	2.649	0.16	-94.1	5.18
MW-04-123S1	9/16/2004	6.99	15.94	2.553	0.69	-96.5	1.45
MW-04-124WT	9/15/2004	6.65	19.67	1.76	0.15	-72.9	6.25
MW-04-124WT	12/21/2004	6.79	8.09	1.417	0.16	NA	1.56
MW-04-124SI	9/15/2004	6.71	18.04	2.048	0.14	-40.5	6.15
MW-04-124SI	12/21/2004	9.58	8.76	3.326	0.21	NA	2.88

Notes:
°C = degrees Celsius.
ORP = Oxidation-Reduction Potential.
mg/L = milligrams per liter.
mS/cm = milliSiemens per centimeter.
mV = millivolts.
NTU = Nephelometric turbidity units.

Table 3. Groundwater Analytical Results - Total and Dissolved Selenium
REALM Inc., Peninsula Area Property, Saginaw, Michigan

Location ID:	Industrial & Commercial II, III & IV Drinking Water Criteria (IDW)	Groundwater Contact Criteria (GCC)	Groundwater Surface Water Interface (GSI)	MW-129WT	MW-129WT	MW-144WT	MW-144WT	MW-144WT
Date Sampled:				9/17/2004	9/17/2004	9/15/2004	12/21/2004	9/15/2004
Sample Type:				FS	DUP	FS	FS	DUP
Inorganics, Total (ug/L)								
Selenium	50 {A}	9.70E+05	5	2.3	1.2 B	12 [GSI]	7.8 [GSI]	10 [GSI]
Inorganics, Dissolved (ug/L)								
Selenium	50 {A}	9.70E+05	5	2	1.4 B	11 [GSI]	7.9 [GSI]	11 [GSI]

Location ID:	Industrial & Commercial II, III & IV Drinking Water Criteria (IDW)	Groundwater Contact Criteria (GCC)	Groundwater Surface Water Interface (GSI)	MW-144WT	MW-144WT	MW01-118WT	MW01-119S1	MW01-119S1
Date Sampled:				10/10/06	10/10/06	9/16/2004	9/16/2004	12/22/2004
Sample Type:				FS	DUP	FS	FS	FS
Inorganics, Total (ug/L)								
Selenium	50 {A}	9.70E+05	5	9.1 J [GSI]	4.9 J	1.1 B	13.8 [GSI]	15.9 [GSI]
Inorganics, Dissolved (ug/L)								
Selenium	50 {A}	9.70E+05	5	8.1 [GSI]	6.8 [GSI]	1.3 B	15.2 [GSI]	17.3 [GSI]

Location ID:	Industrial & Commercial II, III & IV Drinking Water Criteria (IDW)	Groundwater Contact Criteria (GCC)	Groundwater Surface Water Interface (GSI)	MW04-118S1	MW04-119WT	MW04-119WT	MW04-121S1	MW04-121S1
Date Sampled:				9/16/2004	9/16/2004	12/22/2004	9/16/2004	12/22/2004
Sample Type:				FS	FS	FS	FS	FS
Inorganics, Total (ug/L)								
Selenium	50 {A}	9.70E+05	5	2.0 U	15.5 [GSI]	10.6 [GSI]	17.1 [GSI]	16.2 [GSI]
Inorganics, Dissolved (ug/L)								
Selenium	50 {A}	9.70E+05	5	1.3 B	15.3 [GSI]	12.9 [GSI]	16.8 [GSI]	20.2 [GSI]

Table 3. Groundwater Analytical Results - Total and Dissolved Selenium
REALM Inc., Peninsula Area Property, Saginaw, Michigan

Location ID:	Industrial & Commercial II, III & IV Drinking Water Criteria (IDW)	Groundwater Contact Criteria (GCC)	Groundwater Surface Water Interface (GSI)	MW04-121S1	MW04-121WT	MW04-121WT	MW04-122S1	MW04-122WT
Date Sampled:				10/10/06	9/16/2004	12/22/2004	9/16/2004	9/16/2004
Sample Type:				FS	FS	FS	FS	FS
Inorganics, Total (ug/L)								
Selenium	50 {A}	9.70E+05	5	18.4 [GSI]	8.2 [GSI]	8.8 [GSI]	2.0 U	0.95 B
Inorganics, Dissolved (ug/L)								
Selenium	50 {A}	9.70E+05	5	17.3 [GSI]	8.3 [GSI]	10.9 [GSI]	2.0 U	2.0 U

Location ID:	Industrial & Commercial II, III & IV Drinking Water Criteria (IDW)	Groundwater Contact Criteria (GCC)	Groundwater Surface Water Interface (GSI)	MW04-123WT	MW04-123WT	MW04-123S1	MW04-123S1	MW04-124S1
Date Sampled:				9/16/2004	10/11/06	9/16/2004	10/11/06	9/15/2004
Sample Type:				FS	FS	FS	FS	FS
Inorganics, Total (ug/L)								
Selenium	50 {A}	9.70E+05	5	2.3	0.86 J	0.90 B	0.8 J	6.3 [GSI]
Inorganics, Dissolved (ug/L)								
Selenium	50 {A}	9.70E+05	5	1.3 B	0.83 J	1.5 B	2 U	7.3 [GSI]

Location ID:	Industrial & Commercial II, III & IV Drinking Water Criteria (IDW)	Groundwater Contact Criteria (GCC)	Groundwater Surface Water Interface (GSI)	MW04-124S1	MW04-124S1	MW04-124WT	MW04-124WT	MW04-124WT
Date Sampled:				12/21/2004	10/11/06	9/15/2004	12/21/2004	10/11/06
Sample Type:				FS	FS	FS	FS	FS
Inorganics, Total (ug/L)								
Selenium	50 {A}	9.70E+05	5	3.3	3	9.7 [GSI]	5.1 [GSI]	2.1
Inorganics, Dissolved (ug/L)								
Selenium	50 {A}	9.70E+05	5	3.5	4.8	9.7 [GSI]	5.5 [GSI]	1.4 J

Table 3. Groundwater Analytical Results - Total and Dissolved Selenium
REALM Inc., Peninsula Area Property, Saginaw, Michigan

Location ID: / Date Sampled: / Sample Type:	Industrial & Commercial II, III & IV Drinking Water Criteria (IDW)	Groundwater Contact Criteria (GCC)	Groundwater Surface Water Interface (GSI)	MW97-104S1 9/16/2004 FS	MW97-104WT 9/16/2004 FS	MW97-105S1 9/15/2004 FS	MW97-105S1 12/21/2004 FS	MW97-105S1 10/10/06 FS
Inorganics, Total (ug/L)								
Selenium	50 {A}	9.70E+05	5	2.1	2.3	13.6 [GSI]	9.4 [GSI]	10.2 [GSI]
Inorganics, Dissolved (ug/L)								
Selenium	50 {A}	9.70E+05	5	1.1 B	1.8 B	13.6 [GSI]	9.8 [GSI]	11.9 [GSI]

Location ID: / Date Sampled: / Sample Type:	Industrial & Commercial II, III & IV Drinking Water Criteria (IDW)	Groundwater Contact Criteria (GCC)	Groundwater Surface Water Interface (GSI)	MW97-105WT 9/15/2004 FS	MW97-105WT 12/21/2004 FS	MW97-105WT 10/10/06 FS	MW98-108S1 9/15/2004 FS	MW98-109S1 9/15/2004 FS
Inorganics, Total (ug/L)								
Selenium	50 {A}	9.70E+05	5	11.6 [GSI]	8.0 [GSI]	7 [GSI]	1.5 B	1.4 B
Inorganics, Dissolved (ug/L)								
Selenium	50 {A}	9.70E+05	5	13.7 [GSI]	7.0 [GSI]	5.9 [GSI]	1.8 B	1.0 B

Location ID: / Date Sampled: / Sample Type:	Industrial & Commercial II, III & IV Drinking Water Criteria (IDW)	Groundwater Contact Criteria (GCC)	Groundwater Surface Water Interface (GSI)	MW98-109S1 10/11/06 FS	MW98-110S1 9/17/2004 FS	MW98-110WT 9/17/2004 FS	MW98-111S1 9/17/2004 FS	MW98-111WT 9/17/2004 FS
Inorganics, Total (ug/L)								
Selenium	50 {A}	9.70E+05	5	2 U	4.8	2.1	1.4 B	1.9 B
Inorganics, Dissolved (ug/L)								
Selenium	50 {A}	9.70E+05	5	2 U	4.8	1.7 B	2.0 U	0.90 B

Table 3. Groundwater Analytical Results - Total and Dissolved Selenium
REALM Inc., Peninsula Area Property, Saginaw, Michigan

Location ID: / Date Sampled: / Sample Type:	Industrial & Commercial II, III & IV Drinking Water Criteria (IDW)	Groundwater Contact Criteria (GCC)	Groundwater Surface Water Interface (GSI)	TW98-108WT 9/15/2004 FS	TW98-109WT 9/15/2004 FS	MW98-109WT 10/11/06 FS
Inorganics, Total (ug/L)						
Selenium	50 {A}	9.70E+05	5	**1.3 B**	**3.3**	**1.7 J**
Inorganics, Dissolved (ug/L)						
Selenium	50 {A}	9.70E+05	5	**1.2 B**	**2.9**	**1.6 J**

Notes:

B = The detected analyte concentration is estimated between the instrument detection limit and the reporting limit.

D = Concentration is based on a diluted sample analysis.

J = The constituent was positively identified; however, the associated numerical value is an estimated concentration only.

U = The constituent was not detected. The detection limit is noted.

Duplicate results are presented in brackets.

{A} = Criterion is the State of Michigan Drinking Water Standard established pursuant to Section 5 of the Safe Drinking Water Act, Act No. 399 of the Public Acts of 1976.

Constituent concentrations that exceed at least one of the listed criteria from the Natural Resources and Environmental Protection Act 1994 PA 451, Administrative Rules for Part 201 (criteria as updated June 2005) have been highlighted.

Table 4. Surface Water Analytical Results
REALM Inc., Peninsula Area Property, Saginaw, Michigan

Location ID:	Rule 57 Water Quality Values				SW04-01	Wetland-01	Wetland-02
Date Sampled:					9/17/2004	10/10/2006	10/11/2006
Sample Type:	HNDV	WV	FCV	AMV	FS	FS	FS
Volatile Organic Compounds (ug/L)							
1,1-Dichloroethane	62,000	NA	740	6,600	1.0 U	--	--
1,2-Dichloroethene, Total	--	--	--	--	2.0 U	--	--
cis-1,2-Dichloroethene	ID	NA	620	5,500	1.0 U	--	--
trans-1,2-Dichloroethene	ID	NA	1,500	14,000	1.0 U	--	--
2-Butanone	3.8E+06	NA	2,200	20,000	**1.5 J**	--	--
Acetone	4.5E+05	NA	1,700	15,000	**7.3 J**	--	--
Benzene	510	NA	200	890	1.0 U	--	--
Chlorobenzene	3,200	NA	47	420	**0.21 J**	--	--
Chloroethane	2.7E+07	NA	1,100	10,000	1.0 U	--	--
Ethylbenzene	8,900	NA	18	160	1.0 U	--	--
Toluene	51,000	NA	140	840	**0.19 J**	--	--
trans-1,3-Dichloropropene	NA	NA	1,500	14,000	1.0 U	--	--
Trichloroethene	550	NA	200	1,800	1.0 U	--	--
Vinyl chloride	4,400	NA	930	8,400	1.0 U	--	--
Xylenes, Total	83,000	NA	35	310	2.0 U	--	--
Semivolatile Organic Compounds (ug/L)							
1,2-Dichlorobenzene	11,000	NA	13	120	10 U	--	--
1,4-Dichlorobenzene	11,000	NA	16	100	10 U	--	--
2,4-Dimethylphenol	8,700	NA	19	130	5.0 U	--	--
2-Methylnaphthalene	1,000	NA	ID	ID	5.0 U	--	--
4-Methylphenol	45,000	NA	25	230	5.0 U	--	--
bis(2-Chloroisopropyl) ether	47,000	NA	ID	ID	5.0 U	--	--
bis(2-Ethylhexyl)phthalate	160	NA	ID	285	**0.57 J**	--	--
Naphthalene	1,200	NA	13	100	5.0 U	--	--
Phenol	1,200	NA	46	290	5.0 U	--	--
Inorganics, Total (ug/L)							
Arsenic	280	NA	150	340	**10.2**	--	--
Barium	1.6E+05	NA	1,800	5,000	**1,290**	--	--
Cadmium	130	NA	5.9	18	**0.20 B**	--	--
Chromium	9,400	NA	11 (Cr VI)	16 (Cr VI)	**6**	--	--
Copper	64,000	NA	27	46	**18.3 J**	--	--
Iron	--	--	--	--	**26,300 J**	--	--
Lead	190	NA	41	370	**12.4**	--	--
Nickel	2.1E+05	NA	160	1,400	**11 J**	--	--
Selenium	2,700	NA	5	62	**9.1 [FCV]**	**6.5 [FCV]**	**7.3 [FCV]**
Zinc	22,000	NA	360	355	**124**	--	--
Miscellaneous Parameters							
Hardness, Total (mg/$CaCO_3$/L)					**370**	--	--
pH (S.U.)					**8**	--	--

Notes:

The surface water sample collected in September 2004 was analyzed for TCL VOCs, SVOCs, and the 13 inorganics of interest.

Data are shown for those analytes detected in the surface water sample or in one or more of the groundwater samples.

B = The detected analyte concentration is estimated between the instrument detection limit and the reporting limit.

J = The compound/constituent was positively identified; however, the associated numerical value is an estimated concentration only.

NA = Not available.

ID = Inadequate data to develop criterion.

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MW-142WT		
Date	7/30/1995	6/11/1996
Selenium (ug/L)	NA	NA
Selenium (Dissolved) (ug/L)	5 U	5 U

B-2R	
Date	7/29/1995
Selenium (ug/L)	NA
Selenium (Dissolved) (ug/L)	5 U

B-2BAUG	
Date	7/29/1995
Selenium (ug/L)	NA
Selenium (Dissolved) (ug/L)	5 U

MW98-111S1	
Date	9/17/2004
Selenium (ug/L)	1.4 B
Selenium (Dissolved) (ug/L)	2 U

MW04-122WT	
Date	9/16/2004
Selenium (ug/L)	0.95 B
Selenium (Dissolved) (ug/L)	2.0 U

MW04-122S1	
Date	9/16/2004
Selenium (ug/L)	2.0 U
Selenium (Dissolved) (ug/L)	2.0 U

MW01-118WT	
Date	9/16/2004
Selenium (ug/L)	1.1 B
Selenium (Dissolved) (ug/L)	1.3 B

MW04-118S1	
Date	9/16/2004
Selenium (ug/L)	2.0 U
Selenium (Dissolved) (ug/L)	1.3 B

MW-129WT	
Date	9/17/2004
Selenium (ug/L)	2.3[1.2 B]
Selenium (Dissolved) (ug/L)	2[1.4 B]

TW98-109WT		
Date	9/15/2004	10/11/2006
Selenium (ug/L)	3.3	1.7 J
Selenium (Dissolved) (ug/L)	2.9	1.6 J

MW98-109S1		
Date	9/15/2004	10/11/2006
Selenium (ug/L)	1.4 B	2 U
Selenium (Dissolved) (ug/L)	1 B	2 U

MW04-123WT		
Date	9/16/2004	10/11/2006
Selenium (ug/L)	2.3	0.86 J
Selenium (Dissolved) (ug/L)	1.3 B	0.83 J

MW04-123S1		
Date	9/16/2004	10/11/2006
Selenium (ug/L)	0.90 B	0.8 J
Selenium (Dissolved) (ug/L)	1.5 B	2 U

WETLAND-02	
Date	10/11/2006
Total Selenium (ug/L)	7.3

MW04-124WT			
Date	9/15/2004	12/21/2004	10/11/2006
Selenium (ug/L)	9.7 [GSI]	5.1 [GSI]	2.1
Selenium (Dissolved) (ug/L)	9.7 [GSI]	5.5 [GSI]	1.4 J

MW04-124S1			
Date	9/15/2004	12/21/2004	10/11/2006
Selenium (ug/L)	6.3 [GSI]	3.3	3
Selenium (Dissolved) (ug/L)	7.3 [GSI]	3.5	4.8

SW04-01	
Date	9/17/2004
Total Selenium (ug/L)	9.1

WETLAND-01	
Date	10/10/2006
Total Selenium (ug/L)	6.5

MW97-105S1			
Date	9/15/2004	12/21/2004	10/10/2006
Selenium (ug/L)	13.6 [GSI]	9.4 [GSI]	10.2 [GSI]
Selenium (Dissolved) (ug/L)	13.6 [GSI]	9.8 [GSI]	11.9 [GSI]

MW97-105WT			
Date	9/15/2004	12/21/2004	10/10/2006
Selenium (ug/L)	11.6 [GSI]	8 [GSI]	7 [GSI]
Selenium (Dissolved) (ug/L)	13.7 [GSI]	7 [GSI]	5.9 [GSI]

MW-144WT				
Date	7/29/1995	9/15/2004	12/21/2004	10/10/2006
Selenium (ug/L)	NA	12 [10] [GSI]	7.8 [GSI]	9.1 J [4.9 J] [GSI]
Selenium (Dissolved) (ug/L)	5 U [5 U]	11 [11] [GSI]	7.9 [GSI]	8.1 [6.8] [GSI]

X-1A					
Date	7/29/1995	6/20/2001	6/25/2002	6/18/2003	5/25/2004
Selenium (ug/L)	NA	NA	NA	NA	NA
Selenium (Dissolved) (ug/L)	5 U	5 U	5 U	5 U	5 U

X-1B					
Date	7/29/1995	6/20/2001	6/25/2002	6/18/2003	5/25/2004
Selenium (ug/L)	NA	NA	NA	NA	NA
Selenium (Dissolved) (ug/L)	5 U	5 U	5 U	5 U	5 U

X-1CR	
Date	7/29/1995
Selenium (ug/L)	NA
Selenium (Dissolved) (ug/L)	5 U

MW98-110S1	
Date	9/17/2004
Selenium (ug/L)	4.8
Selenium (Dissolved) (ug/L)	4.8

MW04-119WT		
Date	9/16/2004	12/22/2004
Selenium (ug/L)	15.5 [GSI]	10.6 [GSI]
Selenium (Dissolved) (ug/L)	15.3 [GSI]	12.9 [GSI]

MW97-104WT	
Date	9/16/2004
Selenium (ug/L)	2.3
Selenium (Dissolved) (ug/L)	1.8 B

MW97-104S1	
Date	9/16/2004
Selenium (ug/L)	2.1
Selenium (Dissolved) (ug/L)	1.1 B

MW98-108S1	
Date	9/15/2004
Selenium (ug/L)	1.5 B
Selenium (Dissolved) (ug/L)	1.8 B

MW04-121WT			
Date	9/16/2004	12/21/2004	10/10/2006
Selenium (ug/L)	8.2 [GSI]	8.8 [GSI]	5.5 [GSI]
Selenium (Dissolved) (ug/L)	8.3 [GSI]	10.9 [GSI]	5.8 [GSI]

MW04-121S1			
Date	9/16/2004	12/21/2004	10/10/2006
Selenium (ug/L)	17.1 [GSI]	16.2 [GSI]	18.4 [GSI]
Selenium (Dissolved) (ug/L)	16.8 [GSI]	20.2 [GSI]	17.3 [GSI]

TANK FARM BUILDING (ABOVEGROUND TANKS)
GATE
UNPAVED AREA
GRASSY AREA
DELPHI AUTOMOTIVE SYSTEMS PLANT 2 PROPERTY
REALM, INC. (FORMER DELPHI PLANT 2) PENINSULA PROPERTY
REALM, INC. (FORMER GM SMI PLANT) PROPERTY
GM SMI PLANT PROPERTY
REALM, INC. (FORMER GM SMI PLANT) PROPERTY
STAFF GAUGE

MW04-2WT, MW04-9D, MW04-10D, MW04-10WT, MW04-6D, MW04-6WT, MW04-5WT, MW04-5D, MW97-106WT, PZ-36, B-2R,B-2BAUG, B-2, MW-142WT, MW-142D, MW04-1D, MW04-1WT, MW04-2WT, MW04-2D, MW-201S, MW-201D, MW-200S, MW-129 (585.92), TW98-111WT, MW98-111S1, MW98-110S1, TW98-110WT, MW-01-119SI, MW04-119WT (589.56), MW04-122 WT, MW04-122 S1, MW97-104WT, MW97-104S1, SB97-110, MW01-118WT, MW04-118 S1, TW01-120, TW98-108WT, MW98-108S1, SB-310, MW98-109S1, TW98-109WT (586.30), MW04-123 WT(586.33), MW04-123 S1, SB-311, B-3R,BAUG, MW-143WT (589.70), SB98-119, MW04-124 S1, MW04-124 WT (586.17), SW04-01, SB-312, MW97-105S1, SB97-111, MW97-105WT(586.58), MW04-121 WT (586.94), MW04-121 S1, SB98-120, MW-144WT (587.33), SB-314, X-1A,B,C (587.19), X-1CR, SB-313

588, 589, 587, 586

NOTES:

1. BASE MAP DEVELOPED FROM THE FOLLOWING: PHOTOGRAMMETRIC BASE MAP PREPARED BY LOCKWOOD MAPPING, INC. OF ROCHESTER, NEW YORK., AERIAL PHOTOGRAPHY CONDUCTED ON 11/11/94; AND BASE MAP SUPPLIED BY AIR-LAND SURVEYS, INC., AERIAL PHOTOGRAPHY WAS CONDUCTED DURING 11/90.
2. SOME SAMPLE LOCATIONS ARE APPROXIMATE.
3. DUPLICATE RESULTS ARE SHOWN IN BRACKETS.
4. J = THE CONSTITUENT WAS POSITIVELY IDENTIFIED, HOWEVER, THE CONCENTRATION IS ESTIMATED.
5. U = THE CONSTITUENT WAS NOT DETECTED. THE DETECTION LIMIT IS LISTED.
6. NA = DATA NOT AVAILABLE.
7. B = THE DETECTED CONCENTRATION IS AN ESTIMATED VALUE BETWEEN THE INSTRUMENT DETECTION LIMIT (IDL) AND THE REPORTING LIMIT (RL).

LEGEND:

- PROPERTY BOUNDARY
- FENCE LINE
- SURFACE WATER SAMPLE COLLECTION LOCATION
- 586 GROUNDWATER CONTOUR
- (587.33) GROUNDWATER ELEVATION
- GENERAL GROUNDWATER FLOW DIRECTION

GM SMI PLANT PROPERTY RI AND OTHER COMPLETIONS:

- B-2 WATER TABLE MONITORING WELL
- X-1A,B,C MONITORING WELL CLUSTER
- SB-312 SOIL BORINGS

DELPHI PLANT 2 AND PENINSULA PROPERTY RI AND OTHER COMPLETIONS:

- MW-142D MONITORING WELL
- TW98-108WT TEMPORARY WELL
- SB98-120 SOIL BORING
- PZ-36 PIEZOMETER
- TW01-120 GRAB GROUNDWATER SAMPLING LOCATION
- EXCEEDS MICHIGAN PART 201 GENERIC GROUNDWATER SURFACE WATER INTERFACE (GSI)CRITERIA (APPLIES TO GROUNDWATER ONLY)
- SURFACE WATER DATA

0 50' 100'
GRAPHIC SCALE

REALM, INC.
PENINSULA PROPERTY
SAGINAW, MICHIGAN

GROUNDWATER AND SURFACE WATER QUALITY DATA AND WATER TABLE ELEVATION CONTOUR MAP - OCTOBER 9, 2006

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE 1

CONESTOGA-ROVERS & ASSOCIATES

2371 George Urban Blvd.
Depew, New York 14043
Telephone: (716) 206-0202 Fax: (716) 206-0201
www.CRAworld.com

MEMORANDUM

TO: JoAnn Robertson [jrobertson@bbl-inc.com]

REF. NO.: 012650-013002-0001

FROM: Karen Bevilacqua/jbh/1-NF

DATE: November 20, 2006

E-Mail and Regular Mail

RE: Data Quality Assessment and Validation
Realm Plant 2 Landfill – Selenium Sampling
Saginaw, Michigan
October 2006

The following details a quality assessment and validation of the analytical data resulting from the collection of 14 water samples, including one field duplicate in support of the Realm Plant 2 Landfill Site in Saginaw, Michigan, during October 2006. The sample summary detailing sample identification, sample location, quality control (QC) samples, and analytical parameters is presented in Table 1. Samples were analyzed for total and dissolved selenium using United States Environmental Protection Agency (USEPA) Method SW-846 6020. The analysis was completed by Severn Trent Laboratories (STL) in North Canton, Ohio.

The QC criteria used to assess the data were established by the methods and the Quality Assurance Project Plan (QAPP). Application of the quality assurance criteria was consistent with the following guidance document, "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Review", USEPA 540/R-94/013, February 1994.

Sample Quantitation

The laboratory reported detected concentrations of inorganics below the laboratory's practical quantitation limit (PQL)/report limit (RL) but above the laboratory's method detection limit (MDL). The laboratory flagged these sample concentrations with a "B". These concentrations should be qualified as estimated (J) values unless qualified otherwise in this memorandum. The laboratory "B" flags may be disregarded.

Sample Preservation and Holding Times

Sample holding time periods and preservation requirements are presented in the analytical methods. All samples were prepared and analyzed within the method-required holding times.

All samples were properly preserved and cooled to 4°C (±2°C) after collection.

Initial Calibration – Inorganic Analyses

The initial calibration includes a blank and at least one standard for inductively coupled plasma/mass spectrometer (ICP/MS) to establish the analytical curve. The coefficient of variation for calibration curves must be at least 0.995.

Initial calibration is verified with an initial calibration verification (ICV) standard which must recover within 90 to 110 percent.

A review of the laboratory data showed that the inorganic initial calibration curves and ICVs were analyzed at the appropriate frequency and were within the acceptance criteria.

Continuing Calibration – Inorganic Analyses

To ensure the instrument calibration is acceptable throughout the sample analysis period, continuing calibration verification (CCV) standards are analyzed on a regular basis. The CCVs must meet the percent recovery control limits specified above for the ICVs. Criteria for inorganic analyses are the same criteria as used for assessing the initial calibration data.

A review of the laboratory data showed that CCVs were analyzed at the appropriate frequency and the data were within the acceptance criteria.

Method Blank Samples

Method blank samples are prepared and analyzed with the investigative samples to assess the presence and the magnitude of sample contamination introduced during sample analysis. Additionally, continuing calibration blanks (CCBs) are routinely analyzed after each CCV for metals.

For this study, method blanks were analyzed at a minimum frequency of one per analytical batch and CCBs were analyzed for metals after each CCV. The blank results were non-detect for the analytes of interest.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

Matrix spike/duplicate (MS/Dup) samples are prepared and analyzed with the samples for inorganics. The recoveries of spike analyses are used to assess the analytical accuracy achieved on individual sample matrices. If the original sample concentration is significantly greater than the spike concentration, the recovery is not assessed. The RPD between the original sample and the Dup are used to assess analytical precision.

MS/Dup analyses were performed as shown in Table 1. The MS/Dup recoveries were within laboratory control limits for all analytes of interest demonstrating acceptable overall analytical accuracy and precision.

Laboratory Control Sample (LCS) Analysis

The LCS serves as a measure of the overall analytical performance. LCSs are prepared with all analytes of interest and analyzed with each sample batch.

LCSs were prepared and analyzed for metals. The LCS recoveries were within the laboratory control limits for all analytes of interest demonstrating acceptable overall analytical accuracy.

Inductively Coupled Plasma (ICP) Interference Check Sample (ICS) Analysis - Inorganic Analyses

To verify that proper inter-element and background correction factors had been established by the laboratory, ICSs are analyzed. These samples contain high concentrations of aluminum, calcium, magnesium, and iron and are analyzed at the beginning and end of each sample analysis period. The ICSs are evaluated against recovery control limits of 80 to 120 percent.

The ICS analysis results were evaluated for all samples and were within the control limits.

Serial Dilution - Inorganic Analyses

The serial dilution determines whether significant physical or chemical interferences exist due to sample matrix. A minimum of one sample per 20 investigative samples is analyzed at a five-fold dilution. The serial dilution results must agree within 10 percent difference (%D) of the original results for samples with detected concentrations greater than 50 times the instrument detection limit.

Serial dilutions were performed at the proper frequency. All results met the specified criteria.

Target Compound Quantitation

The reported quantitation results and detection limits were checked to ensure results reported were accurate. The samples identified in Table 1 were reviewed. No discrepancies were found between the raw data and the sample results reported by the laboratory.

Field Duplicates

To assess overall analytical and sampling precision, field duplicates were collected and submitted "blind" to the laboratory for analysis as shown in Table 1.

A comparison of the results showed good analytical and sampling precision, with the exception total selenium. All associated sample results were qualified as estimated based on the implied variability (see Table 2).

Overall Assessment

The data were found to exhibit acceptable levels of accuracy and precision, based on the provided information, and may be used with the exceptions and qualifications noted.

TABLE 1

SAMPLE COLLECTION AND ANALYSIS SUMMARY
REALM PLANT 2 LANDFILL - SELENIUM SAMPLING
GENERAL MOTORS VEHICLE MANUFACTURING
SAGINAW, MICHIGAN
OCTOBER 2006

				Analysis/Parameters		
Sample ID	*Location ID*	*Collection Date (mm/dd/yy)*	*Collection Time (hr:min)*	*Dissolved Selenium*	*Total Selenium*	*Comments*
MW04-121WT(101006)	MW04-121WT	10/10/06	12:35	x	x	
MW04-121S1(101006)	MW04-121S1	10/10/06	15:05	x	x	
MW-144WT(101006)	MW-144WT	10/10/06	15:05	x	x	
MW97-105S1(101006)	MW97-105S1	10/10/06	10:20	x	x	MS/MSD
MW97-105WT(101006)	MW97-105WT	10/10/06	12:40	x	x	
DUPE-01	MW-144WT	10/10/06	15:05	x	x	
WETLAND-01(101006)	WETLAND-01	10/10/06	15:30		x	
MW04-123S1(101106)	MW04-123S1	10/11/06	9:55	x	x	
MW04-123WT(101106)	MW04-123WT	10/11/06	10:50	x	x	
MW98-109S1(101106)	MW98-109S1	10/11/06	11:55	x	x	
MW98-109WT(101106)	TW98-109WT	10/11/06	14:39	x	x	
MW04-124S1(101106)	MW04-124S1	10/11/06	11:00	x	x	
MW04-124WT(101106)	MW04-124WT	10/11/06	13:00	x	x	
WETLAND-02(101106)	WETLAND-02	10/11/06	13:35		x	

Notes:
MS Matrix Spike.
MSD Matrix Spike Duplicate.

TABLE 2

QUALIFIED SAMPLE RESULTS DUE TO VARIABILITY IN FIELD DUPLICATE RESULTS
REALM PLANT 2 LANDFILL - SELENIUM SAMPLING
GENERAL MOTORS VEHICLE MANUFACTURING
SAGINAW, MICHIGAN
OCTOBER 2006

Parameter	*Analyte*	*Original Sample ID*	*Original Result*	*Duplicate Sample ID*	*Duplicate Result*	*Absolute Difference*	*Criteria*	*Units*	*Qualifier*
Metals	Selenium	MW-144WT(101006)	9.1	DUPE-01	4.9	4.2	<2.0	µg/L	J

Note:
J Estimated.