CONESTOGA-ROVERS & ASSOCIATES

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MEMORANDUM

TO:	Don McLeod	REF. NO.:	001431
FROM:	John Raby/cs/2 JRR	DATE:	December 13, 2007
C.C.:	Brian Sadowski, Scott Parkhill, Brian Downie Darrell Crockett		
RE:	**Field Activities Summary of the Replacement of PCM-07 at the 102nd Street Landfill**		

On April 17, 2006 Conestoga Rovers and Associates, Inc. (CRA) issued a memorandum to Glenn Springs Holdings, Inc. (GSHI) titled "Review of Hydraulic Containment at the 102nd Street Landfill" (Site). The memorandum reviewed the hydraulic containment data that has been collected at the Site. The data review indicated an inward gradient for all of the monitoring well/piezometer pairs except for the PCM-07/PZ-07 well pair. In reviewing the monitoring well construction details for all of the well pairs on Site, it became apparent that PCM-07/PZ-07 was monitoring two different groundwater intervals in the shallow overburden aquifer. Specifically, piezometer PZ-07 is screened from 564.8 feet Above Mean Sea Level (ft AMSL) to 569.8 ft AMSL while monitoring well PCM-07 is screened from 557.6 ft AMSL to 565.6 ft AMSL. The screened intervals result in a 0.83 foot overlap. Therefore, the wells are not monitoring the same groundwater zone and are unable to be used to prove inward gradient. However, taking the absence of accurate data from this well pair into consideration it was concluded that the groundwater is contained at the Site.

A letter work plan was submitted to the NYSDEC on October 9, 2007 and approved for implementation on October 11, 2007. The work plan described the field activities to be completed for the replacement of monitoring well PCM-07 with PCM-07R. The following text describes the field activities that were completed in accordance with above-mentioned letter work plan.

PCM-07 Decommissioning and Abandonment

CRA contracted Earth Dimensions, Inc. (ED) of Buffalo, NY for drilling services associated with the abandonment of groundwater monitoring well PCM-07 and the installation of the replacement groundwater monitoring well PCM-07R. On Monday October 29, 2007, CRA and ED mobilized to the Site.

The method of abandonment presented in the September 2, 2007 letter work plan was casing pulling. This method was selected in accordance with the New York State Department of Environmental Conservation (NYSDEC) Monitoring Well Decommissioning Policy. However, due to unforeseen circumstances this method could not be utilized for PCM-07 abandonment. As per NYSDEC policy well depth sounding is the first step in decommissioning. In order to sound the well an attempt was made to remove the well sampling pump. The well riser was pinched at the ground surface and the pump would not pass the restriction. The cause of the riser pinch is unknown, however the riser can become deformed or pinched if water becomes

trapped and freezes between the well riser and the outer casing. The next step in the NYSDEC policy is screen puncturing. This could not be accomplished without destroying the pump. A field decision was made by CRA to use the more conservative and complex "overdrilling" method of well decommissioning. However, the screen still could not be punctured as per DEC policy. The fact that the well screen could not be punctured should not adversely affect site conditions since PCM-07 is installed in the upper ground water zone. Therefore, the chance of cross contamination of other groundwater zones does not exist.

The concrete pad of the protective casing was broken up with the auto-hammer of the drill rig. After the pad was removed a second pad was found under the first. This is assumed to be the pad from the original installation of the well and the second upper pad was installed to bring the protective casing up to the final grade of the landfill. The well was then overdrilled using 4 ¼inch hollow stem augers (HSA). The HSAs were advanced to 19-feet below ground surface (ft bgs), the installed depth of PCM-07. The well screen and riser pipe were pulled from the ground. The PCM-07 well materials was measured and compared to the well instrumentation log to ensure that they represented the entire length of the installed well. Grout was prepared to NYSDEC standard, approximately four percent bentonite content by weight. The grout mixture was tremmie grouted into the borehole and the augers were pulled as the grout filled the space. The grout was allowed to cure for 24 hours. Final grouting was completed on October 30, 2007 after minor settling occurred. Attached is the ED supplied Well Decommissioning Record for NYSDEC NPL Sites (Attachment 1).

PCM-07R Installation

The installation of PCM-07R began on October 30, 2007. In order to install the well to the proper depth, the ground surface was surveyed by CRA using a survey grade GPS unit. The ground surface elevation was found to be 576.24 ft AMSL. Based on that elevation, the required depth of the borehole is 13 ft bgs. The new groundwater monitoring well was advanced to the target depth of 13 ft bgs using 4 ¼ inch HSA. Continuous split spoon samples were collected to verify soil stratigraphy (based upon the modified United Soil Classification System [USCS]). The stratigraphy was described as follows:

Ft bgs	Soil Type
0.0 – 0.5	Top Soil
0.5 – 7.0	Clay Fill
7.0 – 9.7	Dry CL-Clay
9.7 – 9.9	Moist CL-Clay
9.9 – 13.0	CH-Clay

Please see the attached Stratigraphic and Instrumentation Log for complete USCS soil description details (Attachment 2). Review of the observed geology at the PCM-07R location shows that the confining layer is present at 566.72 ft AMSL. This elevation is in agreement with the reported approximate Site wide elevation of the confining layer at 566 ft AMSL.

Once the target depth was reached, 6-inches of 00 sand was placed in the borehole. A 5-foot long #6 slot size stainless steel screen attached to a 10-foot long stainless steel riser pipe was placed on top of the sand. The screen is open through a depth of 564.12 ft AMSL to 569.12 ft AMSL. The sand pack, also of 00 sand, was installed as the augers were withdrawn. The sand was brought to an elevation of 571.12 ft AMSL, (two feet above the screen top). Two feet of bentonite chips were installed over the sand to create the well seal. Five gallons of potable water was pored down the borehole to hydrate the bentonite chips. The bentonite chips

were allowed to hydrate for approximately one hour. No grout was used in the PCM-07R installation due to the limited space (3 feet) between the ground surface and the bentonite seal. The remaining space was filled with the concrete pad of the protective casing. A weep hole was drilled in the protective casing to prevent the accumulation of water and reduce the potential for the freezing of that water to pinch the well riser. Please see the attached Stratigraphic and Instrumentation Log for the well details.

Monitoring well PCM-07R was sounded after installation. No water was present in the well; therefore, the well could not be developed. Based on moisture encountered at 9.7 ft bgs to 9.9 ft bgs in soil boring samples, the well is anticipated to have water. It will be necessary to thoroughly surge and purge this well prior to the first sampling event.

ATTACHMENT 1

WELL DECOMMISSIONING RECORD
NYSDEC NPL Sites

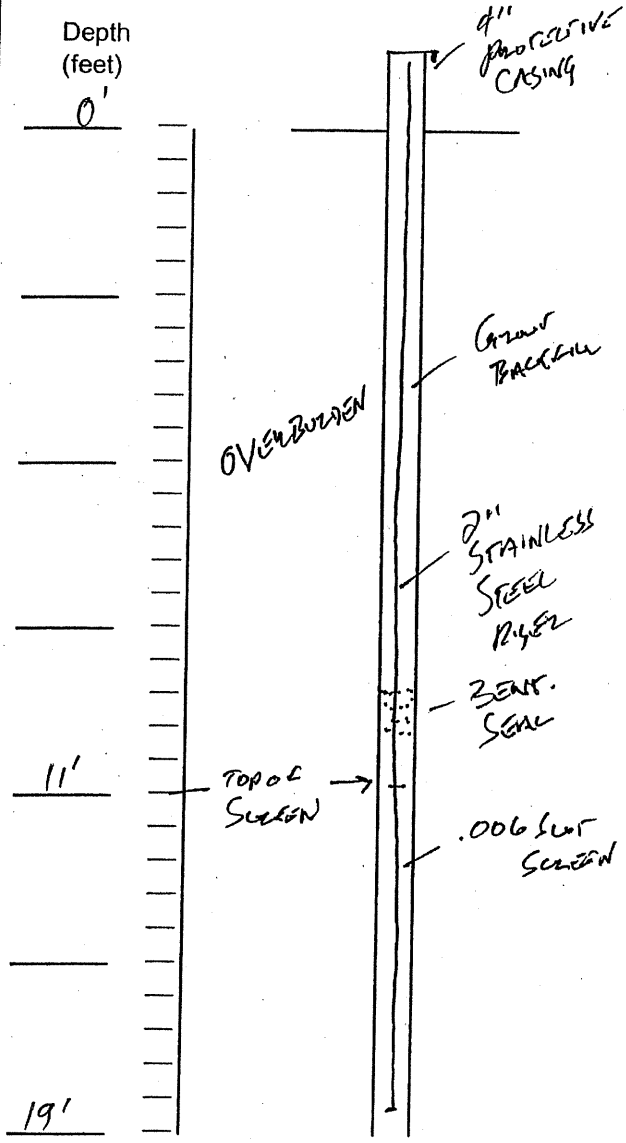
EARTH DIMENSIONS, INC.
1091 Jamison Road • Elma, NY 14059

Site Name:	102ND STREET LANDFILL	Well I.D.	PCM-07R
Site Location:	NIAGARA FALLS, N.Y.	Driller:	PHILIP BENCE
Drilling Co:	EARTH DIMENSIONS, INC.	Inspector:	JOHN RABY
		Date:	10/29/07

DECOMMISSIONING DATA
(fill in all that apply)

OVERDRILLING	
Interval drilled	0' TO 19'
Drilling Method(s)	4 1/4" HSA
Borehole Dia. (in)	8"
Temporary Casing Installed? (y/n)	~~NO~~ YES
Depth temporary casing installed	19'
Casing type/dia. (in.)	AUGERS
Method of installing	ROTARY
CASING PULLING	
Method employed	WINCH
Casing retrieved (feet)	21'
Casing type/dia. (in)	2" S.STEEL
Casing perforating	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	19'
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	27 GAL.
Quantity of cement used (lbs.)	282 LBS
Cement type	PORTLAND I
Quantity of bentonite used (lbs.)	12 LBS.
Quantity of calcium chloride used (lbs.)	N/A
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	40

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

EARTH DIMENSIONS, INC.
Drilling Contractor

Dept Representative

ATTACHMENT 2

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: 102nd Street Landfill
PROJECT NUMBER: 01431
CLIENT: GSHI
LOCATION: Niagara Falls, NY

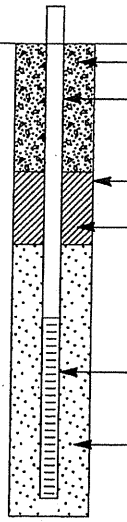
HOLE DESIGNATION: PCM-07R
DATE COMPLETED: October 30, 2007
DRILLING METHOD: 4 1/4 HSA
FIELD PERSONNEL: J. Raby

NORTHING: 1120172.52
EASTING: 1051213.37

TOP OF RISER 579.58
GROUND SURFACE 576.62

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft Ft. NGVD
0	TOPSOIL	576.12
	FILL, clay	
8	CL-CLAY with silt, medium stiff, medium plasticity, massive structure, yellowish orange, dry	569.62
10	- moist below 9.7 ft BGS	
12	CH-CLAY, trace fine sand, stiff, high plasticity (with added water), massive structure, yellowish orange, dry	566.72
	END OF BOREHOLE @ 13.0ft BGS	563.62

MONITOR INSTALLATION



WELL DETAILS
Screened interval:
569.12 to 564.12ft Ft. NGVD
7.50 to 12.50ft BGS
Length: 5ft
Diameter: 2in
Slot Size: 10
Material: STAINLESS STEEL
Seal:
573.12 to 571.12ft Ft. NGVD
3.50 to 5.50ft BGS
Material: BENTONITE
Sand Pack:
571.12 to 563.62ft Ft. NGVD
5.50 to 13.00ft BGS
Material: 00 SAND

SAMPLE NUMBER	INTERVAL	REC (ft)	'N' VALUE
SS1		0.8	
SS2		1.4	
SS3		1.7	
SS4		1.6	
SS5		2.0	
SS6		2.0	

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 01431.GPJ CRA_CORP.GDT 11/28/07