MEMORANDUM

KW Furey
Engineering, P.C.
Engineering & Construction Management

To: R. Slingerland, Village Manager **Date:** 8/26/09

From: K.W. Furey, P.E. **cc:**

Re: Taylors Lane

Reference is made to the correspondence dated August 24, 2009 from Ram Pergadia of the New York State Department of Environmental Conservation (NYSDEC).

Mr. Pergadia's most recent correspondence appears to express the opinion that, the State's selected remedy in the November 1993 Record of Decision (ROD), has not adequately addressed the groundwater issues at the site. That said, this is still an inference from the ongoing discussions and correspondences with Mr. Pergadia, and the Village has yet to receive a formal directive that, in accordance with Section VII of the ROD, it has been determined that the contingent remedy is necessary at the site. Specifically, the ROD states "The contingent remedy will be implemented if the groundwater monitoring wells on the west side of Taylors Lane have pesticides, arsenic, cadmium, copper, lead, mercury or zinc migrating in detrimental quantities off-site toward Magid Pond and Otter Creek." To date, after twelve years of groundwater monitoring samples, the data continues to show only minor, sporadic exceedences of the drinking water standards for the compounds of interest as per the ROD, and a continued trending decrease in said contamination overall (See Attachment A). While it is our opinion that these minor exceedences in the monitoring wells do not meet the threshold of "migrating in detrimental quantities off-site", it would be prudent to ask for a formal determination from the NYSDEC on this issue prior to proceeding with any further remedial action at the site.

As regards the specifics contained in Mr. Pergadia's most recent correspondence, there are several inaccuracies and misinterpretations that require clarification. Therefore, we feel it is necessary to address each on an item by item basis.

Mr. Pergadia states that over the last few years the NYSDEC has been working with the Village in developing a remedy for eliminating leachate buildup at the site. Since the state first contacted the Village relative to the leachate issues on the site in 2004, the apparent focus of the discussions has always been the apparent leachate outbreaks at the Weinstein Residence and, to a lesser extent, at the Markowicz residence. As recent as 8/11/08 (approximately a year ago), in a correspondence from Mr. Pergadia (Attachment B), he specifically states the remedial objective of the pump testing to be the attenuation of the leachate outbreaks at the Weinstein and Markowicz residences, and nowhere mentions migration of leachate impacted groundwater toward Magid Pond 88or Otter Creek.. It was with a focus towards addressing this specific issue, that the pump tests were conducted and the agreement with the Westchester County Department of Environmental Facilities (WCDEF) initiated for the disposal of leachate to the Mamaroneck WWTP. This testing was not conducted with the intent of developing a plan for lowering the leachate level in the entire landfill. Furthermore, the characterization that the results of the pump tests, history of the site and the 1992 Feasibility Study (FS) confirm the viability of the remedy presented in the attachment to Mr. Pergadia's 8/24/09 correspondence, is an opinion not supported by the factual results of the pump testing, nor in agreement with either our evaluation nor that of Shaw Environmental's entire project team. In fact, the results of the pump test, based on preliminary calculations completed by Shaw Environmental (Attachment C), indicate that in order to lower the leachate level in the landfill utilizing extraction wells alone, would require an estimate 21 wells pumping at 35 gpm each for a total flow of 735 gpm or 1,058,400 gpd (5% of the total dry weather capacity of the plant!). WCDEF would never agree to accepting such a large quantity of leachate form the landfill. On a final note relative to the remedy presented in Mr. Pergadia's correspondence, he refers to the 100 gpm flow number as noted on page 3-7 of the 1993 FS for the site. It needs to be noted that the quantity being quoted is based on "and order of magnitude

estimation only" (i.e. 100 - 900 gpm are all in the same order of magnitude so the 735 gpm number calculated by Shaw would meet this definition), does not ever address to what level the landfill is being drawn down to under this flow rate or at what elevation the drain from this trench is to be constructed at (or if it is to be pumped for that matter), is to used *in conjunction with* two pumped extraction wells flowing at a controlled 40 gpm each, and specifically states beginning on page 3-7 and ending on page 3-8 "The steady level cannot be estimated based on the existing data and would require additional testing during design (testing which we have now done and find the number to be higher but still in the same order of magnitude) Moreover, the assumptions used in calculating these flow rates in the FS assumed that the discharge rates would decrease over time because of "„decreased recharge associated with the placement of the Part 360 Cap,..." which time has shown not to be an accurate assumption.

Mr. Pergadia goes on to assert that Mike Sherwood of Shaw Environmental asked "why the leachate from the landfill, which 'almost meets groundwater standards,' needs to be sent to the WWTP,...". This is not entirely accurate. What Mr. Sherwood asked is that, relative to the control of impacted groundwater adjacent to the landfill migrating towards Magid Pond, since the sampling of the Monitoring Wells and outflow from the trench drain that has been collecting the groundwater along Taylors Lane itself since 2005, and currently runs at a fairly constant 2 - 3 gpm during dry weather conditions (which has resulted in the elimination of the "uncontrolled releases of leachate across Taylor's Lane" refereed to in an earlier correspondence of Mr. Pergadia) shows that the monitoring wells, with the exception of a few minor and sporadic exceedences, meets drinking water standards (Attachment A) and that sampling from the outfall of the trench drain (which discharges to the catchbasin one structure upstream of the Magid Pond Outfall) indicated non-detect for all VOC's, SVOC's, pesticides, PCBs and Non-Volatile compounds of interest (Metals) with the exception of Barium which showed as approximately .5 ppm above the NYS Part 703 Standard (Attachment D), could the groundwater be relieved at the southern portion of the landfill and disposed of through a State Pollution Elimination Discharge Permit (SPDES) to address the issue of migration of leachate impacted groundwater towards Magid Pond. At no time was it our intention to remove leachate directly from the waste and discharge it through a SPDES Permit, and, as we have discussed, it was thought that the leachate extraction well adjacent to Mr. Weinstein's Property would most likely still be necessary to prevent the localized lateral migration of leachate in that direction (As is indicated in your 8/20/09 correspondence to the NYSDEC that the Village would continue to pursue this avenue to the extent it might be necessary for future implementation). The characterization that the Village is "setting aside" the results of the pump test and the agreement in principal with WCDEF in favor of pursuing a SPDES permit is a misinterpretation of the Village's position. Furthermore, Mr. Pergadia's proposed remedy does in fact, both set aside the results of the pump test as well as the requirements of the agreement with the WCDEF relative to the volume of leachate to be removed from the Landfill as discussed above.

Mr. Pergadia states that it is not the intention of the NYSDEC to prevent the Village from exploring all effective remedial alternatives, yet the proposed leachate well arrangement proposed by Shaw for addressing the leachate seeps along Greenhaven Road and Shadow Lane were rejected outright by Mr. Pergadia, and he continues to promote a remedial design that neither myself nor any of the other professionals who have reviewed the data believe has any chance of achieving any of the stated objectives. He goes on to state that the sampling of the effluent from the first pump test was established as having leachate characteristics by WCDEF, and therefore did not meet groundwater standards. This statement is not entirely accurate, the testing by WCDEF only indicated theat the quality of the effluent was acceptable for acceptance by the Mamaroneck WWTP with our any further pre-treatment. As an aside, Mr. Bob Cea, of WCDEF, who is responsible for the sampling and pretreatment program, indicated at the meeting subsequent to the first pump test that there were strong chemical indicators that the effluent from the pump testing was salt water or groundwater highly impacted by salt water, and would suggest salt water intrusion into the aquifer under the landfill. Mr. Pergadia goes on to state that the Taylors Lane Site remains listed as a Class 2 site on the State's Registry of inactive hazardous Waste Sites

because of the failure of the remedy completed in 1996. While the site is indeed still classified as a Class 2 Site, the Village has yet to receive an official notification of the failure of the State's selected remedy under the ROD. Furthermore, the continuation of the Site's listing as a Class 2 site is standard operating procedure until such time as there is an official determination that there are no potential future environmental risks from the site, and does not necessarily indicate a determination of failure of the remedy implemented in 1996. Mr. Pergadia goes on to state that "implementation of the remedy that has been jointly developed seems to be the most appropriate action to take" As previously discussed, the remedy presented by Mr. Pergadia is not one which either the Village Engineer nor Shaw Environmental agrees with, nor do we see it as achieving any of the remedial objectives most recently voiced by Mr. Pergadia, let alone the alleviation of potential leachate seeps on the eastern boundary of the site which was the purpose of the pump tests conducted. Furthermore, Mr. Pergadia asks for a remedial design in one months time form now, a schedule not achievable even if the conceptual design was agreed upon as he states, which it is not.

I believe that the Village needs to get some clear direction from the NYSDEC regarding the current status of the remediation of the Site. Up to this point, I do not believe that has been the case, and the target appears to be ever changing. As of this date, the 1993 ROD is still the governing document relative to the closure of the Taylors Lane Site. By definition, "the ROD presents the remedial action plan for an inactive hazardous waste disposal site and documents the information and rationale used to arrive at the decision... ***It serves as the definitive record of the remedy selection process for the site*** ..." In accordance with the ROD for Taylors Lane, if the "...the groundwater monitoring wells on the west side of Taylors Lane have pesticides, arsenic, cadmium, copper, lead, mercury or zinc migrating in detrimental quantities off-site toward Magid Pond and Otter Creek." then the contingent remedy (2B - construction of a slurry wall and leachate extraction wells) will be implemented. Had NYSDEC made this determination in 2004 when this process started, then implementation of this action would have already begun. Instead, the Village was charged with controlling suspected leachate seeps along Greenhaven Road and Shadow Lane, an entirely different remedial objective. Since the ROD has not been amended, if the NYSDEC is determining that the above criteria have been met for triggering the Contingent Remedy, then that is the remedy which *must* be pursued. Currently there are not any amendments to the ROD, and if Mr. Pergadia is suggesting that we should be following a new remedy, then that is exactly what would be necessary. Amended remedial decisions require additional review and public input, and changes to the final remedial action plan may occur only in two cases:

1. If the ROD specifically provides for later addition of documents and reserves a portion of the decision to a later time;
2. If new and significant information is received or generated after the ROD is finalized.

In either case, an amended ROD must go through additional review and public comment periods.

Therefore, I would respectfully recommend that you ask the NYSDEC for clarification to:

1. The issue if it has been determined, in accordance with the criteria set forth in the ROD, that the Contingency Remedy is to be implemented , then we will need to proceed with procurement of a Remedial Design Firm in accordance with the Requirements of Title III and request and amendment to the Village's State Assistance Contract (SAC) for Remedial Design and Construction of Remedy 2B (additional capital cost of $1,872,000 adjusted by a Construction Cost Index of 227.41 to 2009 dollars would be $4,257,000 plus the estimated annual operating cost for the treatment system of $172,000 annually);
2. If it has not been determined definitively, can we make the case that the criteria has not been met to require implementation of the contingency remedy, and proceed to address the suspected local leachate

seeps along Greenhaven Road and Shadow Lane as originally anticipated;

3. If the NYSDEC has determined that the Contingent Remedy is to be implemented, but instead of preceding in accordance with the stipulations of the 1993 ROD, wished to reopen the ROD so as to amend it and formulate an new contingent remedy. It should be noted that the testing and investigations conducted to date were specifically focused on the suspected leachate seeps along the eastern boundary of the site and are not extensive enough nor target at achieving larger global groundwater objectives, implementation of an amended ROD would require a definitive statement of remedial objectives, evaluation criteria and a new feasibility study prior to proceeding with a new remedial design

You may feel free to paraphrase and/or include this memorandum in its entirety to the NYSDEC in your response to Mr. Pergadia's 8/25/09 correspondence. Additionally, you should copy all of the same individuals listed on Mr. Pergadia's ecc list, as well as Dale A. Desnoyers, Director, Division of Environmental Remediation. As always, fell free to contact me should you have any questions.

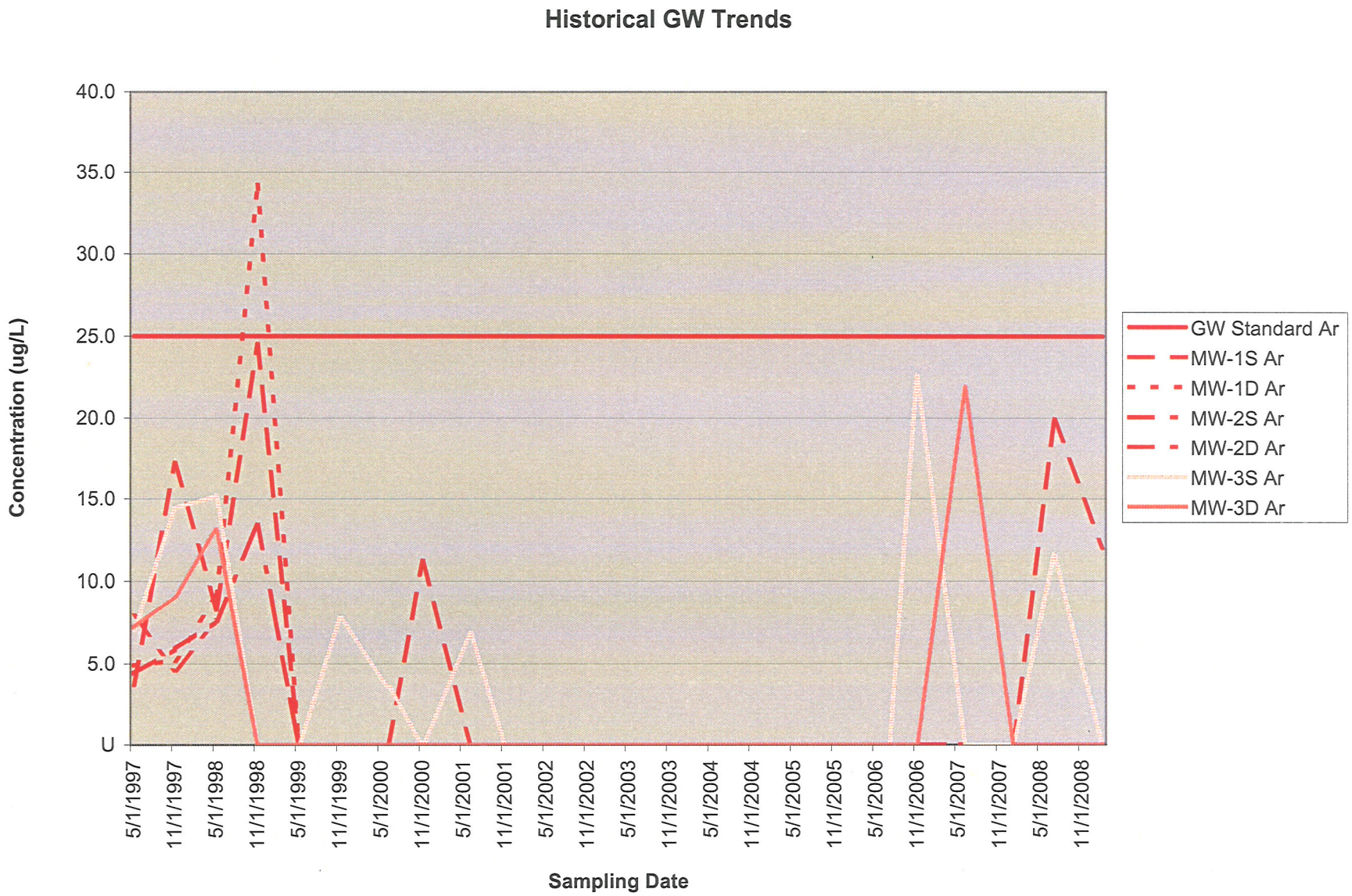
Enclosures
KWF/df

Taylors Lane Historical GW Sampling

Attachment A

Well	MW-1S						MW-1D						MW-2S									
Parameter	Arsenic	Cadmium	Copper	Lead	Mercury	Zinc	Arsenic	Cadmium	Copper	Lead	Mercury	Zinc	Arsenic	Cadmium	Copper	Lead	Mercury	Zinc	Vinyl Chloride	1,2-Dichloroethene	MTBE	Tert-Butyl-Alcohol
GW Standard	25.0	5.0	200.0	25.0	0.7	2,000	25.0	5.0	200.0	25.0	0.7	2,000	25.0	5.0	200.0	25.0	0.7	2,000	2.0	5.0	10.0	20
5/22/1997	3.7	U	5.7	U	U	20.0	4.9	U	3.6	U	U	17.2	4.4	U	19.9	4.4	U	31.3	**4.0**	2.0		
11/14/1997	17.2	3.3	46.5	2.4	U	74.2	5.2	U	13.1	U	U	37.0	5.9	1.2	34.2	2.9	U	75.0	**21.0**	3.0		
5/19/1998	8.3	0.8	9.3	1.4	U	130.0	9.1	0.2	3.7	U	U	12.7	7.6	0.7	5.7	0.8	U	23.7	**17.0**	3.0		
11/5/1998	24.5	1.1	8.3	U	U	13.9	**34.2**	U	16.6	U	U	27.9	13.4	0.9	13.9	U	U	23.3	**14.0**	3.0		
5/25/1999	U	1.4	6.8	U	U	15.0	U	U	21.4	U	U	36.7	U	U	7.2	U	U	16.2	**13.0**	2.0		
11/18/1999	U	2.8	21.8	U	U	26.8	U	U	23.1	U	U	38.0	U	2.1	103.0	21.0	0.09	95.6	**6.0**	U		
6/28/2000	U	1.1	U	U	0.05	7.9	U	U	15.0	**44.4**	U	104.0	U	1.4	36.0	7.2	0.02	202.0	**7.8**	1.6		
11/15/2000	11.2	U	87.0	U	U	U	U	U	38.4	**91.8**	U	1,650	U	U	U	8.1	U	52.8	U	U		
6/20/2001	U	3.2	10.3	1.7	U	25.0	U	2.3	17.7	**37.9**	U	630.0	U	4.0	145.0	**45.2**	U	274.0	**7.6**	1.2	**190.0**	
11/29/2001	U	U	U	U	U	U	U	U	U	U	U	29.5	U	U	25.9	U	U	23.1	U	U	**82.0**	**270.0**
6/26/2002	U	U	U	U	U	U	U	U	23.0	U	U	28.2	U	U	U	5.9	U	76.8	1.6	U	**50.0**	**130.0**
11/19/2002	U	U	U	U	U	U	U	U	40.0	5.6	U	69.6	U	U	47.0	13.2	U	65.2	U	U	**56.0**	**210.0**
6/24/2003	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	**3.3**	U	**270.0**	U
11/17/2003	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	1.2	U	**250.0**	**120.0**
6/21/2004	U	U	U	U	U	21.0	U	U	U	U	U	U	U	U	U	U	U	U	1.0	U	**380.0**	**90.0**
11/22/2004	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.6	U	**380.0**	**200.0**
6/22/2005	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	**7.7**	1.1	**16.0**	**23.0**
11/22/2005	U	U	U	U	U	20.5	U	U	31.2	10.7	U	144.0	U	U	U	U	U	32.9	**4.1**	U	**61.0**	**90.0**
7/5/2006	U	U	U	U	U	25.0	U	U	U	U	U	51.0	U	U	U	U	U	U	**6.4**	0.6	**63.0**	**110.0**
11/27/2006	U	U	21.6	U	U	23.3	U	U	64.1	13.2	U	352.0	U	U	28.5	13.2	U	84.7	**4.0**	U	**70.0**	**110.0**
6/27/2007	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	**2.5**	U	**93.0**	**250.0**
1/9/2008	U	U	51.8	6.7	U	38	U	U	37.5	11.0	U	343.0	U	U	U	U	U	31.7	**2.2**	U	**74.0**	**350.0**
7/23/2008	19.9	U	U	**26.5**	U	38.9	U	U	U	6.5	U	U	U	U	U	10.4	U	U	**2.8**	0.5	**12.0**	**37.0**
2/20/2009	12.0	U	U	5.7	U	U	U	U	U	U	U	U	U	U	U	U	U	U	1.3	U	**16.0**	**43.0**

Well	MW-2D						MW-3S						MW-3D					
Parameter	Arsenic	Cadmium	Copper	Lead	Mercury	Zinc	Arsenic	Cadmium	Copper	Lead	Mercury	Zinc	Arsenic	Cadmium	Copper	Lead	Mercury	Zinc
GW Standard	25.0	5.0	200.0	25.0	0.7	2,000	25.0	5.0	200.0	25.0	0.7	2,000	25.0	5.0	200.0	25.0	0.7	2,000
5/22/1997	7.9	U	U	U	U	12.6	7.1	U	18.8	12.7	U	83.7	7.2	U	14.5	21.2	U	931.0
11/14/1997	4.6	0.9	7.7	U	U	10.6	14.4	2.8	74.3	**36.1**	U	102.0	9.1	1.9	35.3	18.2	U	514.0
5/19/1998	7.6	0.4	4.5	U	U	51.4	15.2	1.3	26.8	14.6	U	48.7	13.1	2.6	12.3	16.6	U	806.0
11/5/1998	13.4	1.2	77.4	U	U	8.8	U	4.2	15.5	6.1	U	29.9	U	U	85.8	23.5	U	659.0
5/25/1999	U	U	18.5	U	U	20.4	U	U	9.4	13.0	U	21.8	U	4.9	17.5	12.7	U	558.0
11/18/1999	U	U	7.6	U	U	21.3	7.8	4.8	**478.0**	**68.0**	0.27	102.0	U	1.6	22.1	3.6	U	101.0
6/28/2000	U	U	U	U	U	26.8	3.6	1.1	**255.0**	**98.5**	0.34	432.0	U	U	U	17.5	0.04	941.0
11/15/2000	U	U	U	U	U	72.6	U	U	43.2	22.5	U	122.0	U	**5.1**	U	19.6	U	**2,040**
6/20/2001	U	U	17.1	5.1	U	U	6.9	4.5	**520.0**	**62.3**	0.28	314.0	U	U	16.0	7.3	U	246.0
11/29/2001	U	U	U	U	U	U	U	U	**204.0**	21.5	U	56.5	U	U	U	U	U	56.4
6/26/2002	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
11/19/2002	U	U	U	U	U	42.9	U	U	U	5.1	U	U	U	U	U	U	U	U
6/24/2003	U	U	U	U	U	55.5	U	U	U	6.8	U	U	U	U	U	U	U	U
11/17/2003	U	U	U	U	U	55.5	U	U	U	21.5	U	38.6	U	U	U	U	U	U
6/21/2004	U	U	U	U	U	U	U	U	27.4	17.8	U	45.7	U	U	U	U	U	U
11/22/2004	U	U	U	U	U	U	U	U	56.0	10.1	U	113.0	U	U	U	12.4	U	U
6/22/2005	U	U	U	U	U	U	U	U	U	U	U	113.0	U	U	U	U	U	U
11/22/2005	U	U	U	U	U	U	U	U	U	11.3	U	33.3	U	U	U	5.6	U	58.6
7/5/2006	U	U	U	U	U	U	U	U	26.0	6.0	U	U	U	U	U	U	U	U
11/27/2006	U	U	U	U	U	U	22.6	**10.4**	38.7	**54.2**	U	64.4	U	U	U	7.3	U	65.5
6/27/2007	U	U	U	U	U	U	U	U	U	U	U	U	21.9	U	106.0	**72.5**	U	1,150
1/9/2008	U	U	U	U	U	U	U	U	74.5	5.9	U	45.6	U	U	U	11.5	U	148.0
7/23/2008	U	U	U	10.4	U	U	11.6	U	U	16.1	U	69.5	U	U	U	U	U	61.4
2/20/2009	U	U	U	U	U	U	U	U	U	U	U	45.0	U	U	U	U	U	44.0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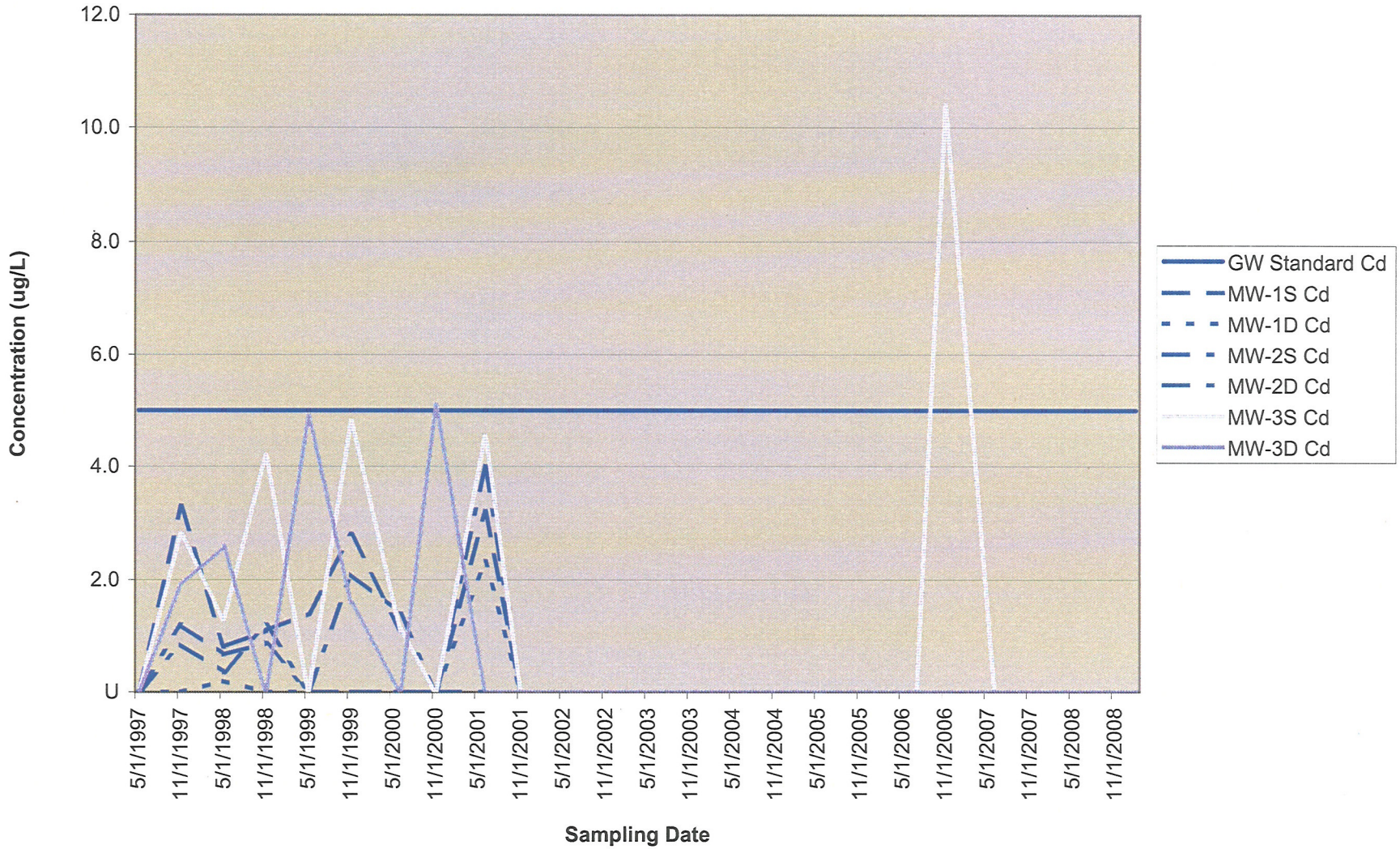
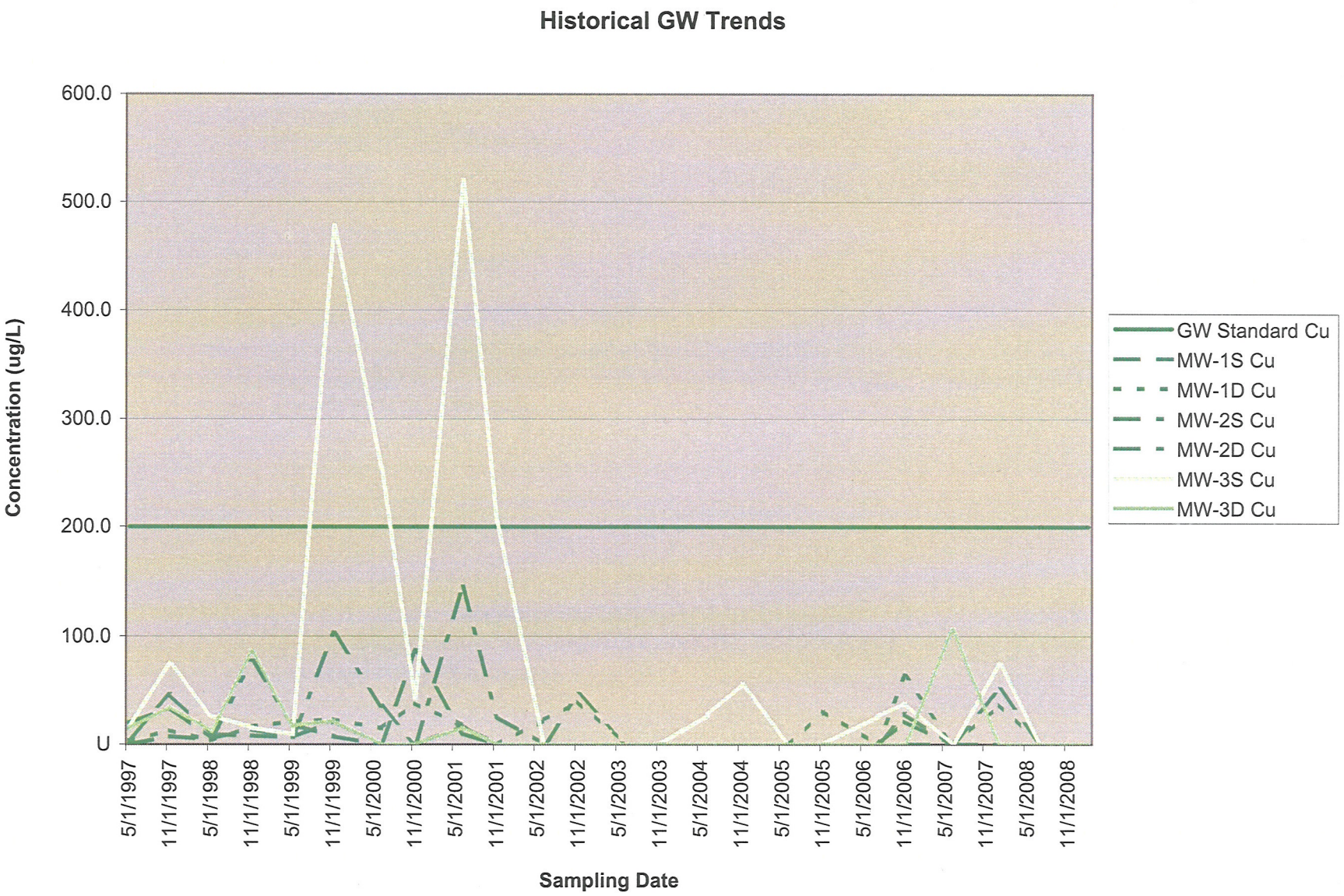
Historical GW Trends

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Concentration (ug/L)
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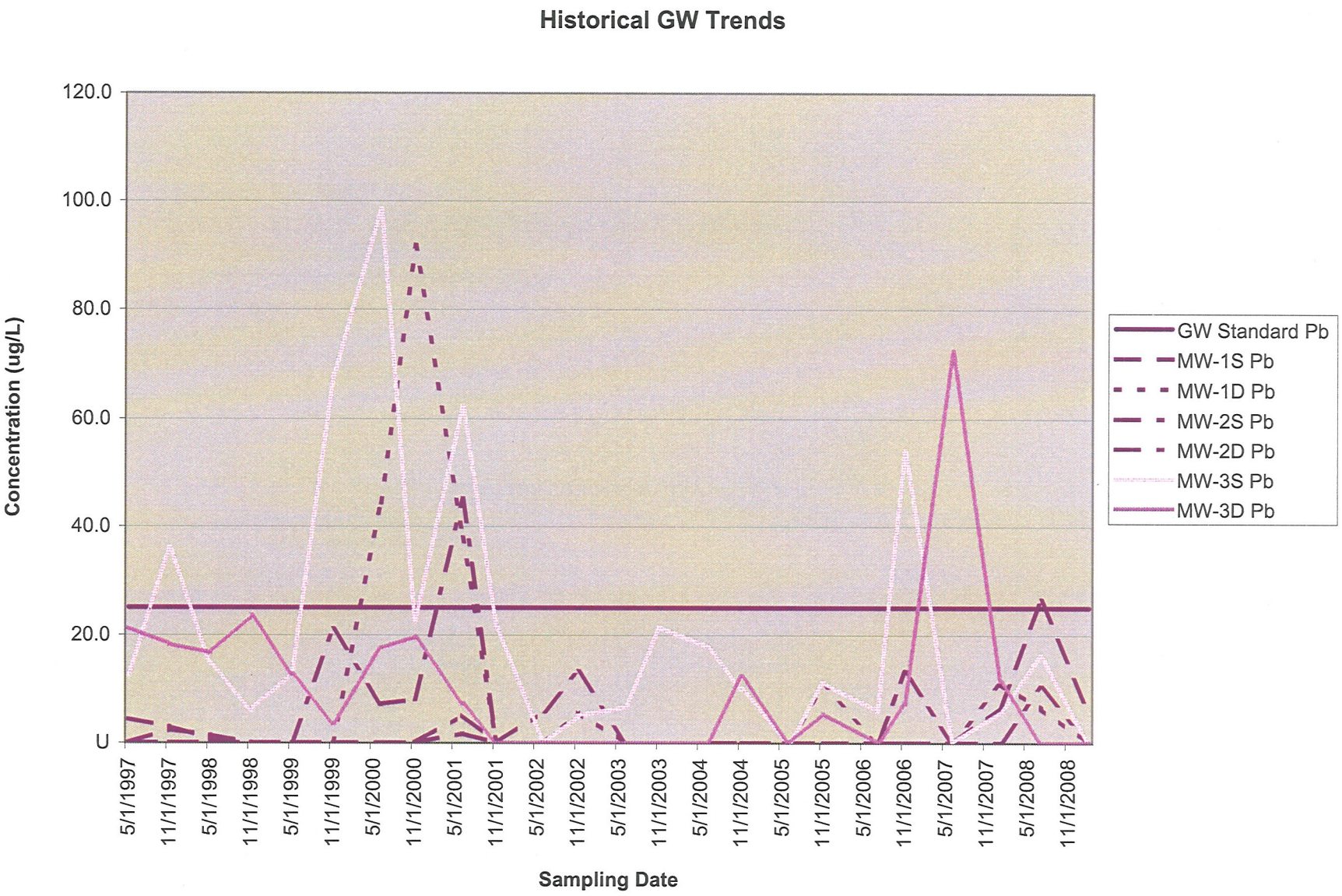
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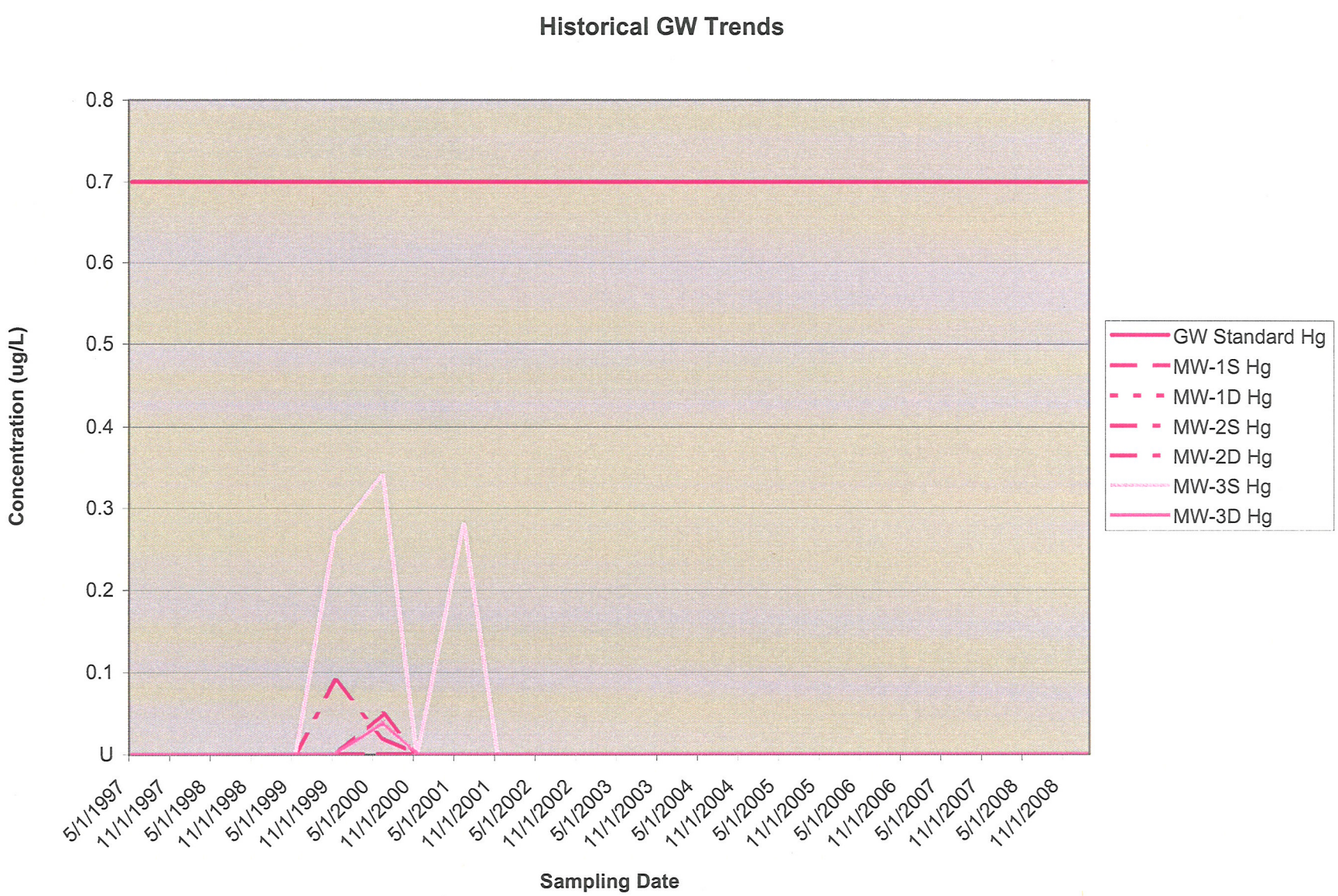
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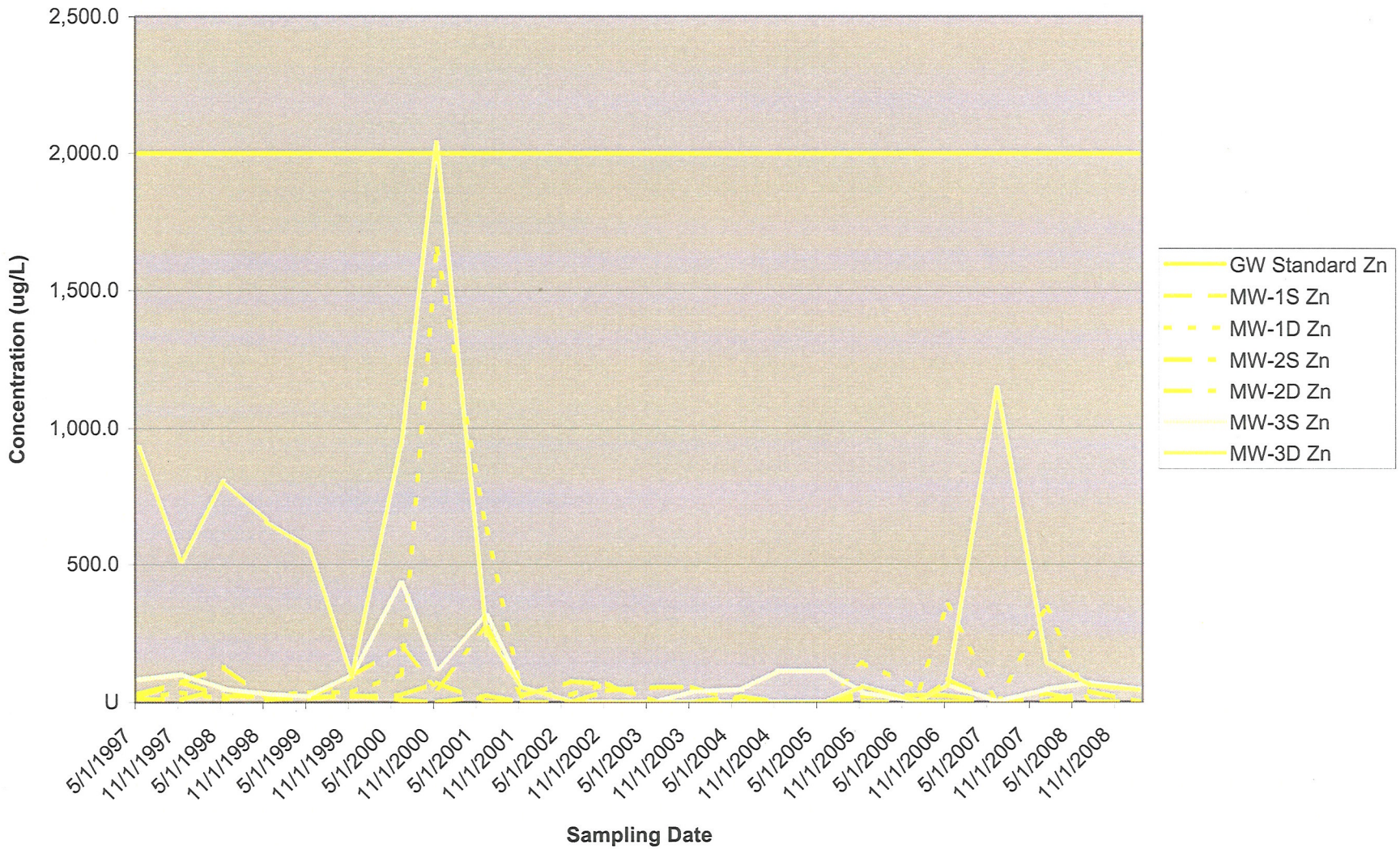
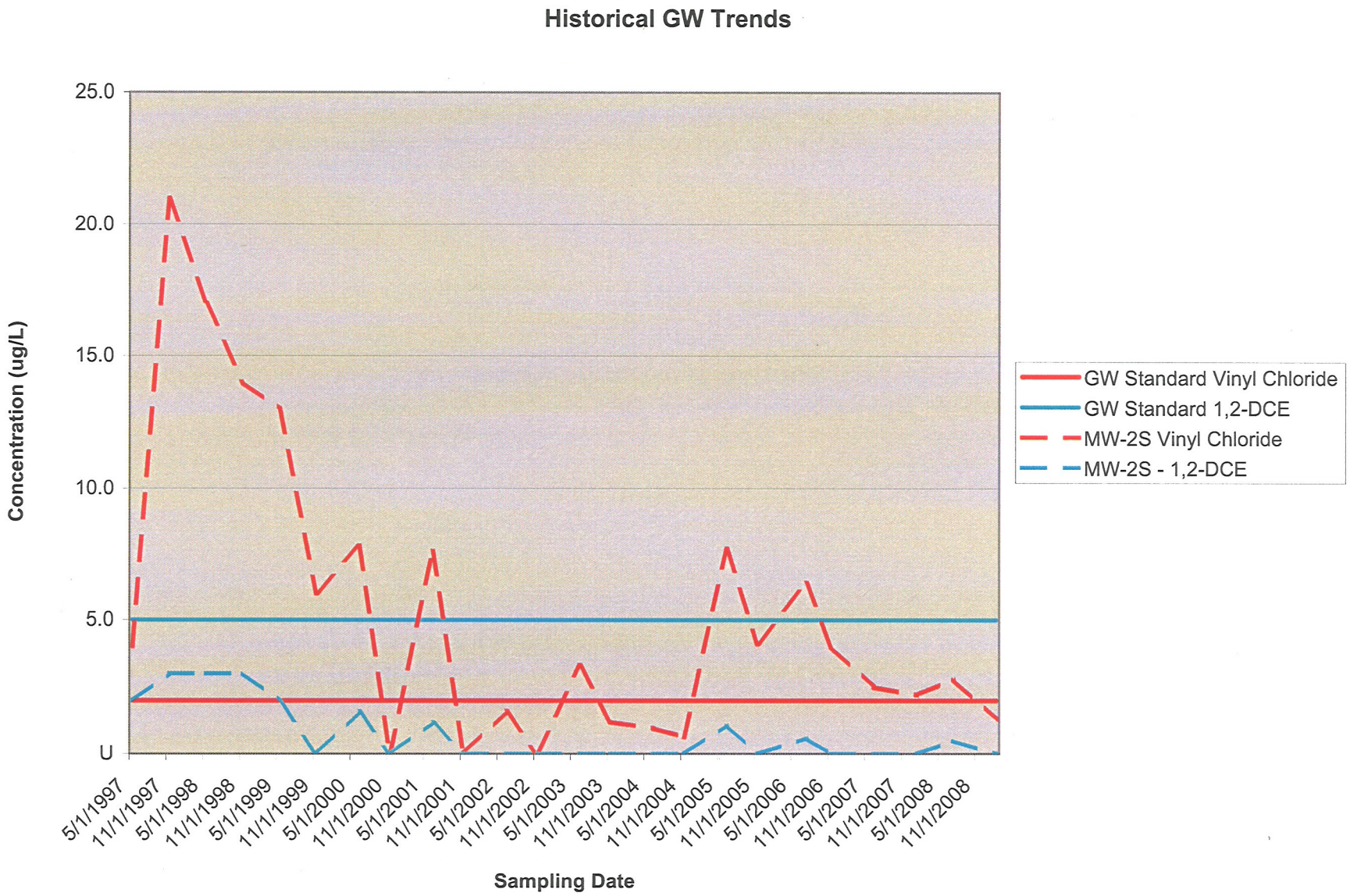
11/1/2002
5/1/2003
11/1/2003
5/1/2004
11/1/2004
5/1/2005
11/1/2005
5/1/2006
11/1/2006
5/1/2007
11/1/2007
5/1/2008
11/1/2008
Sampling Date
GW Standard Hg
MW-1S Hg
MW-1D Hg
MW-2S Hg
MW-2D Hg
MW-3S Hg
MW-3D Hg

Historical GW Trends




Historical GW Trends
Concentration (ug/L)
25.0
20.0
15.0
10.0
5.0
U
5/1/1997
11/1/1997
5/1/1998
11/1/1998
5/1/1999
11/1/1999
5/1/2000
11/1/2000
5/1/2001
11/1/2001
5/1/2002
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11/1/2004
5/1/2005
11/1/2005
5/1/2006
11/1/2006
5/1/2007
11/1/2007
5/1/2008
11/1/2008
Sampling Date
GW Standard Vinyl Chloride
GW Standard 1,2-DCE
MW-2S Vinyl Chloride
MW-2S - 1,2-DCE

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 3
21South Putt Corners Road, New Paltz, New York 12561-1696
Phone: (845) 256-3146 FAX: (845) 255-3414

Alexander B. Grannis
Commissioner

August 11, 2008

ROBERT A. YAMUDER
ASSISTANT VILLAGE MANAGER
VILLAGE OF MAMARONECK
VILLAGE HALL
P.O. BOX 369
123 MAMARONECK AVENUE
MAMARONECK , NEW YORK 10543

Sub: Mamaroneck Taylor's Lane Composting, Site ID No. 360021
Scope of Work for Mitigating Leachate Buildup.

Dear Mr. Yamuder:

I have reviewed Shaw Environmental's proposed scope of work dated July 24, 2008, and the following comments are, in the main, reiterations from my letter of July 17, 2008 on the subject.

1) The objectives of the work as stated below must be included in the introductory section:

The pump test will be undertaken to establish the following:

a) The draw-down elevation of the leachate at the pump location (gas vent GV-8) to prevent leachate from rising above the sump bottoms in the basements of the affected houses (Markowitz's and Weinstein's).

b) The leachate elevation at the pump to satisfactorily drain the leachate by gravity into the Westchester County sewer line along Taylor Lane and achieve objective "a" above.

2) In the proposal, water level measurements are confined only to monitoring wells. Since most of the wells within the footprint of the landfill have been decommissioned, the data gathered may prove to be too sparse for drawing reliable inferences about variations of leachate surface patterns during the pump test. The measurements must include the leachate elevations at GV-5, GV-6 and GV-7.

3) During working hours while the pump test is being conducted, leachate level measurements must be taken every 4-hours during the first day of the test, at 8-hour intervals the second day

Keith W. Furey, P.E.

From: Sherwood, Michael [Michael.Sherwood@shawgrp.com]
Sent: Tuesday, June 23, 2009 3:12 PM
To: Keith W. Furey, P.E.
Subject: FW: Taylor's Lane-Calculations

Keith,

Please review the two emails below from Andy and Curt which were generated in response to your request for the approximate volume of groundwater (leachate) in the landfill and the approximate gpm flow rate required to essentially cut-off groundwater flowing into the pond. Just lowering the groundwater across the landfill to elevation 9.5 feet, consistent with Ram's conceptual model, would require a flow rate of approximately 735 gpm. To evacuate all groundwater to an elevation below the refuse would be an astronomical number several orders of magnitude higher.

Please let me know if you have any questions or comments.

Thank you,
Mike

Michael Sherwood
Client Program Manager
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914.633.9324 x3756 direct
516.650.5290 cell
www.shawgrp.com

From: Kraemer, Curtis
Sent: Tuesday, June 23, 2009 2:32 PM
To: Sherwood, Michael
Subject: FW: Taylor's Lane-Calculations

Mike:

I concur with Andy's assessments presented below.

In response to Keith's question regarding what would it take to keep the leachate level down to elevation 9.5, it is probably best to use the profiles generated by Keith. While all of the profiles are similar, I'll use the November 08 Section. I'll also make some assumptions to keep the discussion straightforward; the hydraulic properties in the vicinity of MW-14M and MW-14S are similar throughout the fill material; the groundwater/leachate elevation is 12.5 MSL and we need to lower this level elevation so it is not any higher than elevation 9.5 MSL (a minimum of 3 foot drop in elevation).

In November 08, MW-14M was pumped for 24 hours continuously at approximately 35 gpm with an estimated (unable to collect actual measurement) drawdown of 7.5 feet. The resulting drawdown in MW-14S, 9 feet away was approximately 2.5 feet. This is graphically shown on the November 08 cross section. Based on the graphical representation of the drawdown, a drawdown of 1.5 feet would occur at distance of no more than 15 feet from the pumping well, MW-14M.

When two pumping wells have cones of depression which overlap, the total amount of drawdown is the sum of the two cones of depression. In this case, if there are two wells spaced 30 feet apart, each cone of depression would generate 1.5 feet of drawdown at the mid point. This would result in a total drawdown of 3 feet at the

midpoint between the wells. If we apply this to the entire Site (approximately 650 ft wide when perpendicular to the direction of groundwater flow) it would take a minimum of 21 wells, spaced at 30 feet, pumping at 35 gpm, or a continuous interceptor trench, to span this distance and keep the groundwdater/leachate elevation to an elevation no higher than 9.5 feet (three feet of drawdown). 21 wells pumping at 35 pgm is a total of **735 gpm**.

While this is a simplification of the assessment of what it would take to keep the groundwater/leachate level at the required elevation, it is based on data generated at the Site and is a reasonable approximation.

Curt

Curtis A. Kraemer, P.G.
Senior Geologist
Shaw Environmental, Inc.
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Colchester, CT 06415
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www.shawgrp.com

From: Andy Cheung [mailto:acheung@nycwatershed.org]
Sent: Tuesday, June 23, 2009 10:46 AM
To: 'Sherwood, Michael'
Cc: 'Kraemer, Curtis'
Subject: Taylor's Lane-calculations

Mike,

As discussed earlier, here is a summary of the calculations and descriptions of each:

Theoretical Volume of Groundwater

The landfill and Magid pond are both situated in the Beaver Brook Aquifer which flows from North to South. Since this is an unconfined aquifer, we can estimate an approximate 1 mile flow length and a 1,500 feet flow width. With an aquifer depth to bedrock of 65', there could theoretically be approximately 4 billion gallons of groundwater flowing through the unconfined aquifer just in this 1 mile area flowing through the landfill, to Magid pond then ultimately discharging into Otter Creek.

Theoretical volume of groundwater/leachate inside landfill

The landfill has a footprint area of 290,000 square feet. Cover soils and waste are approximately 20' deep based on the cross-section developed previously. Compost material typically have a porosity of between 0.3 and 0.8. If we take a snapshot of just the landfill itself, the above parameters would result in a total volume of liquid of between 13 million to 35 million gallons of groundwater/leachate.

Hope this helps with the discussions tomorrow. Let me know with any questions.
Thanks

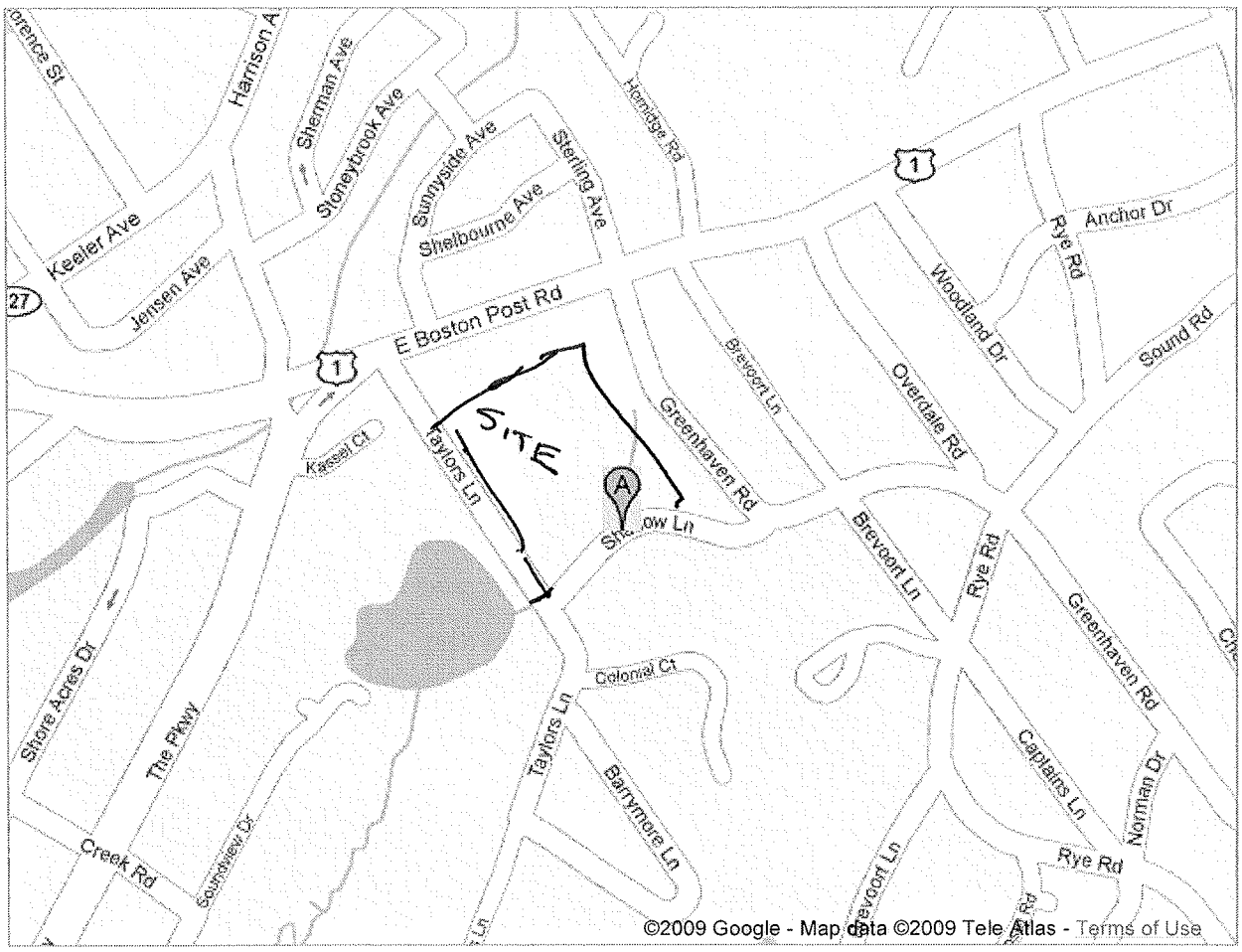
Andy Cheung, P.E.
Project Engineer
Watershed Agricultural Council
East of Hudson Program
1275 Hanover Street
Yorktown Heights, NY 10598

Table 3
Mamaroneck-Taylors Lane
Mamaroneck, New York
Trench Outfall Quality
Sampling Results
Nov-06

Sample ID	NYS Part 703		SS-2		SS-2		SS-2		SS-2		SS-2		SS-2	
Sampling Date		LLDC	11/27/06		11/27/06		11/27/06		11/27/06		11/28/06		11/28/06	
			9:00		13:00		17:00		21:00		1:00		5:00	
Units	mg/L	mg/L	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
CONSTITUENT														
Volatile organic compounds	*			U		U		U		U		U		U
Semi-volatile organic compounds	*			U		U		U		U		U		U
Pesticides	*			U		U		U		U		U		U
PCBs	*			U		U		U		U		U		U
Arsenic	0.025	0 2	0 0100	U	0.0100	U	0 0100	U	0 0100	U	0 0100	U	0.0100	U
Barium	1	2 0	1.57		1 48		1.49		1 49		1 51		1 50	
Cadmium	0.005	0.7	0.00500	U	0 00500	U	0 00500	U	0 00500	U	0.00500	U	0.00500	U
Chromium (Total)	0.05	3 0	0.0100	U	0.0100	U	0.0100	U	0 0100	U	0 0100	U	0.0100	U
Copper	0.2	2 8	0 0200	U	0.0200	U	0.0200	U	0 0200	U	0.0200	U	0 0200	U
Lead	0.025	0.4	0.00500	U	0 00500	U	0.00500	U	0.00500	U	0.00500	U	0.00500	U
Mercury	0.0007	0.2	0 000300	U	0.000300	U	0 000300	U	0 000300	U	0.000300	U	0 000300	U
Nickel	0.1	2 8	0.0400	U	0.0400	U	0.0400	U	0 0400	U	0 0400	U	0 0400	U
Selenium	0.01	0 2	0.0100	U	0.0100	U	0.0100	U	0 0100	U	0 0100	U	0 0100	U
Silver	0.05	0 8	0 0100	U	0.0100	U	0.0100	U	0 0100	U	0.0100	U	0.0100	U
Zinc	2	1 8	0 0200	U	0 0200	U	0 0200	U	0 0200	U	0.0200	U	0 0200	U
Chromium (HEX)	0.05	2 0	0 0100	U	0.0154		0 0100	U	0 0100	U	0 0100	U	0 0100	U
Cyanide	0.2	0 8	0 0100	U	0.0100	U	0 0100	U	0 0100	U	0 0100	U	0.0100	U
Oil & Grease (Total)	NS	100 0	5 0	U	5.0	U	5 0	U	5.0	U	5.0	U	5.0	U
Phenols	NS	4 0	0 00500	U	0.00500	U	0.00500	U	0 00500	U	0.00500	U	0 00500	U

Notes
NYS Part 703 groundwater quality standards and guidance values
mg/L= milligrams per liter or parts per million
Local Limits Discharge Criteria (LLDC)
Total Toxic Organics were not detected
NS=no value
U-not detected
* varies with parameter

Google maps Address



CK FLOOD PLAIN - FEMA