PERFORMANCE REVIEW

WAGNER ROAD INTERIM RESPONSE

March 2007

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INTRODUCTION

The Washtenaw County Circuit Court, in its' December 14, 2004, Opinion and Order Regarding Remediation of the Contamination of the "Unit E" Aquifer, ordered Pall Life Sciences (PLS) to submit a work plan to the Michigan Department of Environmental Quality (MDEQ) which will, to the maximum extent feasible, prevent further migration of groundwater contamination above 85 micrograms per liter (µg/L) of 1,4-dioxane eastward into the Unit E aquifer. PLS submitted a Work Plan for Groundwater Extraction (Work Plan) at Wagner Road in August 2005, which included a Performance Monitoring Plan (PMP). The MDEQ responded to the August 2005 Work Plan in November 2005 granting conditional approval and requesting a revised PMP. In December 2005, PLS submitted a revised PMP for the Wagner Road Extraction (Wagner Road Interim Response [WRIR]). The MDEQ responded to the revised PMP in March 2006. The MDEQ did not approve the December 2005 revised PMP, rather they made several comments and requests.

Extraction from TW-18, located at Wagner Road, began January 12, 2006, and has been operating since that time. PLS submitted its' first performance monitoring review for the WRIR in August 2006. The August 2006 performance monitoring review addressed the substance of the MDEQ March 2006 requests and presented an interpretation of performance monitoring data collected for the period January 12 through May 31, 2006.

This performance evaluation presents a continued interpretation of performance monitoring data collected for the period June 1, 2006 – January 2007. This performance period does not correspond to the quarterly reporting cycle.

The location of TW-18, associated performance monitoring wells, and other relevant geographic features are shown on Figure 1.

NEW WELL INSTALLATIONS

MW-108S AND MW-108D

PLS installed one monitoring well nest (MW-108s and MW-108d) along Park Lake Road, north of MW-71, at the location shown on Figure 1. MW-108s and MW-108d were installed between October 13 and 24, 2006. A test boring (PLS-06-13; aka MW-108) was advanced using a hollow-stem auger to a depth of 226 feet below the ground surface (bgs). Split-spoon and Simulprobe sampling methods were employed for collection of soil and soil/groundwater, respectively. All groundwater samples were analyzed for 1,4-dioxane by PLS. An onsite geologist was present during the boring and well installation.

Each well was completed using a 2-inch galvanized-steel well casing with 2-inch stainless-steel screen (7 Slot). MW-108s was screened from 150 to 155 feet bgs, and MW-108d was screened from 177 to 182 feet bgs. Both wells were finished with flush mounts and equipped with locking caps and locks. All soil cuttings derived from drilling and development water were transported to PLS for appropriate management.

The boring log, gamma log, relevant groundwater sample collection, and analytical information for MW-108s and MW-108d were provided to the MDEQ. Boring and gamma logs for these wells are provided in Attachment 1. Analytical results for groundwater samples collected during drilling of the MW-108 test boring are provided in Table 1.

VERTICAL AQUIFER SAMPLES

Vertical Aquifer Sample (VAS) data were collected at the MW-108 test boring to assist developing specific performance standards for MW-71. These data provide a better understanding of the vertical 1,4-dioxane distribution at this site.

Samples collected from 89 to 130.5 feet bgs are interpreted to be within the upper Unit E plume equivalent to the interval that was not vertically sampled during installation of

MW-71. PLS installed the shallow monitoring well (MW-108s) in this interval. The 179 to 180.5 feet bgs sample is interpreted to be the Unit E plume interval screened in MW-71. MW-108d was screened in this interval. The well drilling analytical results are provided in Table 1.

HYDROGEOLOGICAL ANALYSIS

The hydrogeological characteristics in the vicinity of TW-18 have been well-documented by the installation of numerous borings, monitoring wells, and aquifer performance testing. Five geologic cross sections included in the August 2006 Wagner Road Performance Review showed the geometry of the hydrofacies in the vicinity of Wagner Road. These cross sections depicted stratigraphic correlations generally transverse (to the longitudinal axis) of the Unit E aquifer and plume, as well as downgradient of Wagner Road in the area located east of the First and Second Sister Lakes.

Three cross sections are included in this report. Cross Section A-A' (Figure 2) is constructed using wells along Wagner Road and spans northward to Jackson Road. Cross Section B-B' (Figure 3) is constructed of wells downgradient of Wagner Road. Figure 3 includes the MW-108 (new boring/well) and extends northward into the Evergreen Area. Hydrostratigraphic correlations between MW-71 and wells MW-108s and MW-108d are shown on Cross Section B-B'. For reference purposes, the analytical results for groundwater samples collected during installation are annotated next to the MW-108 boring. A hydrogeologic analysis of the findings are provided in the following paragraphs. Cross Section C-C' (Figure 4) is constructed using logs from select wells located north of MW-94. These cross sections are provided to augment the discussion that follows. A brief review of the key observations included in the August 2006 Wagner Road Performance Review is provided below:

- The thickness of the glacial drift sequence along Wagner Road ranges from approximately 220 to 280 feet. The lowest portion of the drift is in the area of MW-65/TW-12 at approximately 650 feet above mean sea level (amsl).

- At least two distinct aquifer systems are present along Wagner Road. One aquifer is encountered at elevations generally above 840 feet amsl and is associated with the Unit C3 plume. Wells screened in this aquifer in the Wagner Road area include TW-2, MW-3d, MW-9d, MW-12, and MW-15s.

- The C3 aquifer is separated vertically from a more extensive aquifer (approximately 840 feet amsl down to bedrock) associated with the Unit E plume and the Unit D2 plume (the latter is located in areas north of TW-18).

- The Unit E aquifer thins to the south and is largely replaced by a diamicton unit in the vicinity of MW-68.

- MW-105d is screened in a Unit E interval, which occupies a stratigraphically lower interval and elevation when compared to the screened interval at TW-18 and MW-96 (Cross Section A-A'). Thinning of the overall sand thickness at MW-105 may relate to the general increase in diamicton thickness laterally downgradient of the Dolph Park area (shown on Cross Section D-D' of the August 2006 report).

- In the vicinity of MW-105 and TW-12, the Unit E aquifer likely trends generally north-northeastward. This observation is based on two lines of reasoning. First, the presence of thick diamicton sediments at MW-67, MW-68, and MW-70 and virtual loss of Unit E sands at these locations. Secondly, Unit E groundwater elevation contours show a generally northward groundwater flow in the area of TW-12 and MW-105.

A 1,4-dioxane isoconcentration contour map, using January 2007 data, for the Wagner Road area is presented as Figure 5. A potentiometric surface map, using February 2007 data, is provided as Figure 6.

Vertical and Horizontal Distribution of 1,4-Dioxane in the Wagner Road Area

The installation of MW-108s and MW-108d provides new observations regarding the vertical and horizontal distribution of 1,4-dioxane in the area downgradient of Wagner Road. A review of Cross Section B-B' indicates the Unit E sands encountered at MW-71 are also present at MW-108. High 1,4-dioxane concentrations encountered at MW-108 confirm the former interpretation that MW-71 is positioned south of the longitudinal axis of the Unit E plume and downgradient of TW-18. Additionally, the high 1,4-dioxane concentrations in the upper interval at MW-108 suggest the corresponding Unit E sand interval at MW-71 may also be impacted by 1,4-dioxane. This upper interval is screened in MW-108s. PLS recommends MW-108s and MW-108d be added to the list of performance monitoring wells for Wagner Road.

1,4-Dioxane associated with Unit E appears to be present in three distinct vertical zones. In the area of MW-105 (Cross Section A-A'), the highest 1,4-dioxane concentrations were encountered at the base of the aquifer, just above the bedrock. PLS believes the source of the 1,4-dioxane at the base of the Unit E aquifer, near MW-105, is the area near MW-65/TW-12. This is supported by both geological and groundwater flow interpretations. 1,4-Dioxane in MW-105d continued decreasing from 1,104 µg/L (August 3, 2006), to 1,035 µg/L (October 12, 2006), and to 980 µg/L at last sampling (January 12, 2007).

In the area of TW-18, 1,4-dioxane levels were highest in the middle to base of the aquifer. At MW-94, 1,4-dioxane concentrations were greatest in the upper portion of the aquifer. These stratifications are shown on Cross Section A-A'. As noted in the previous performance review, there is no indication these zones are hydraulically isolated from each other; rather, they likely reflect preferential pathways for plumes coming from different upgradient areas.

The Wagner Road/Evergreen Transition Area

In the area north of TW-18, data suggest that both the Unit E plume and the Unit D2 plume are present. Review of Cross Section A-A' shows these plumes occupy the same hydrofacies along Wagner Road, but appear somewhat distinguishable by their elevations. Cross Section A-A' shows the Unit E plume center at TW-18 is at approximately 740 feet amsl, and the D2 plume center at MW-94 is at approximately 840 feet amsl. Using lithologic cross sections only, it becomes very difficult to "split" these plumes in this area and discern specifically where the D2 plume turns northward, following a different flow path compared to the underlying Unit E.

Based on previous geologic work and historic isoconcentration maps of the D2 plume, previous interpretations have shown the longitudinal axis of the Unit D2 plume to be parallel and north of the Unit E along Wagner Road. This transition or split has historically been mapped at locations upgradient and north of MW-94, thus leading to the reasonable interpretation for the Unit E plume to be the areas south of an imaginary line between MW-94 and MW-30d (the Wagner Road/Evergreen Transition Area). However, the high 1,4-dioxane concentrations encountered during installation of the MW-106 test boring at approximately 750 to 760 feet amsl (the MW-94 interval) and at 810 to 820 feet amsl (the TW-18 interval), plus a review of historical water-quality data (Cross Section C-C'), suggests the Unit D2 and E plumes may migrate eastward, past Wagner Road, in the same geographic area. If the Unit D2 plume migrates more eastward, along with the Unit E plume, and crosses Wagner Road, a review of existing data suggest it would then begin migrating north, toward Jackson Road. Historical water-quality data (shown on Cross Section C-C') suggest the pathway would be between 3459 Ferry and MW-30i. Support for this new interpretation includes:

- MW-106s is screened in a similar stratigraphic interval as MW-94s. This shallower interval could be interpreted as the Unit D2 plume, suggesting the Unit D2 plume travels east of Wagner Road from MW-94 to MW-106.

- 1,4-Dioxane was not detected at the base of the combined Unit D2/E aquifer at MW-69 (although no VAS was performed in this interval).

- 1,4-Dioxane was historically not detected at 3459 Ferry; however, at the same time, 1,4-dioxane was detected at high concentrations at 3432 Ferry, 3409 Ferry, and 3365 Jackson. These data are shown on Cross Section C-C'.

- MW-108s had a low concentration in the 820 feet amsl interval of the Upper E Unit. This suggests the shallower (Unit D2) plume observed in the MW-106s level, near the Wagner Road area, has turned north prior to reaching this point.

Either two scenarios, or a combination of the two, remain possibilities for how Unit D2 crosses Wagner Road. Regardless, it remains PLS' position that PLS is not obligated to capture the Unit D2 plume along Wagner Road. To the extent that the Unit D2 migrates with the Unit E plume, and crosses Wagner Road near TW-18, more of the Unit D2 plume will be captured by TW-18. Furthermore, there would be a very limited area of the Unit D2 plume that is not being captured by TW-18. Installing an exterior well to capture this area would provide little if any benefit.

DISCUSSION ON PROPOSED PERFORMANCE CRITERIA

The December 2006 PMP proposed that performance of the WRIR be judged by an evaluation of water-level and water-quality data from selected wells. Performance standards for the WRIR, as proposed in the December 2006 PMP, are italicized below. Relevant comments and updated information are provide as non-italics:

MW-70 – Concentrations of 1,4-dioxane in groundwater samples from this well will remain below 85 micrograms per liter (µg/L).

Comment – PLS believes this remains an appropriate performance criteria for the WRIR. Groundwater samples were nondetect for 1,4-dioxane from the most recent sampling (October 12, 2006) at MW-70.

MW-71 – When MW-71 was installed, VAS was not performed. As such, there remains uncertainties regarding the distribution of 1,4-dioxane at this well location and what portion of the Unit E is being monitored. PLS is proposing that a boring be drilled either at the MW-71 site, or a location slightly north, to collect data regarding the vertical distribution of 1,4-dioxane in this important area. Once there is a better understanding of the vertical 1,4-dioxane distribution at this site, PLS will work with the MDEQ to establish appropriate performance criteria for this site.

MW-71 has experienced a general increase from the initial concentration of 370 µg/L on October 17, 2001, and currently remains somewhat flat since the May 5, 2006, sampling. 1,4-Dioxane at MW-71 was 885 µg/L on May 5, 2006; 857 µg/L on October 23, 2006; and 882 µg/L on January 4, 2007.

The MW-108 cluster was drilled to provide additional insight into the 1,4-dioxane distribution in the area of MW-71. Installation of MW-108s and MW-108d provided information confirming the former interpretation that MW-71 is positioned south of the longitudinal axis of the Unit E plume and downgradient of TW-18. High 1,4-dioxane concentrations in the upper Unit E interval screened at MW-108s suggest the corresponding Unit E sand interval at MW-71 may also be impacted by 1,4-dioxane.

It is clear that MW-71 and the MW-108 cluster are positioned along the Unit E plume, downgradient of the WRIR. However, given the distance of these wells from the WRIR and uncertainties of the geological conditions in the Sisters Lakes area, which lies between the wells and the WRIR, along with a very flat hydraulic gradient, PLS is concerned about assigning specific performance criteria to these wells. PLS is willing to discuss such criteria with the MDEQ, but, at this time, cannot commit to meeting specific criteria.

MW-105 – MW-105 was not installed specifically as a performance monitoring well. PLS may identify a performance standard for this well once it is installed and preliminary information from the boring/well has been evaluated.

1,4-Dioxane at MW-105 is believed associated with the area of TW-12 and MW-65. 1,4-Dioxane levels at TW-12 and the MW-65 well cluster have remained below 85 µg/L through the August 2006 and this performance review. This is likely the result of operation of TW-12. Water-quality data were analyzed at MW-105d with results as follows:

- 1,104 µg/L (August 3, 2006)
- 1,035 µg/L (October 27, 2006)
- 980 µg/L (January 22, 2007)

These results form a downward trend and, as such, it is reasonable to infer that 1,4-dioxane concentrations in groundwater sampled from MW-105d will decline further. PLS proposes routine monitoring of MW-105d continue and the results be used to confirm this downward trend. With time, sufficient data may allow a prediction of the time it will take to reach 85 µg/L. For the present, it is difficult to establish a specific performance criteria. PLS is willing to discuss possible performance criteria for MW-105d, after additional water samples are collected.

PERFORMANCE ANALYSIS

SYSTEM OPERATION DATA

The Wagner Road Unit E extraction wells include TW-11, TW-12, TW-17, and TW-18. Unit E extraction data for operating period June 2006 through January 2007 are provided in Attachment 2. As shown, these data include the January 2006 through January 2007 extraction data.

System Flow Rates

Operation of TW-18 at Wagner Road began on January 12, 2006. Extraction rates from TW-18 remained relatively steady at approximately 200 gallons per minute (gpm) through May 2006. The total volume of groundwater extracted from TW-18 and treated during the January 12 through May 31, 2006, interval was approximately 38,440,468 gallons. The total volume of groundwater extracted from TW-18 for this review period (June 2006 through January 2007) is 120,744,691 gallons. Breaking this down, the total volume of groundwater extracted from TW-18 during the period June through December 2006 was 111,249,050 gallons, with an average flow rate of 184 gpm (inclusive of 12 days with zero withdrawals). The cumulative total volume extracted at TW-18 during 2006 was 191,020,207 gallons. For the month of January 2007, the total volume of groundwater extracted at TW-18 was 9,495,641 gallons, with an average flow rate of 213 gpm.

TW-11 and TW-17 have continued to operate at combined flow rates of approximately 200 gpm (total). These wells intercept groundwater before it migrates toward TW-18. Operation of TW-11 and TW-17 reduce the amount of groundwater TW-18 needs to extract to maintain a given capture zone.

System Influent Quality

PLS routinely collects water samples from the influent to the treatment system from TW-18. Influent water samples are routinely analyzed for 1,4-dioxane concentrations. Data for the period June 1 to January 31, 2007, are provided in Attachment 3.

A plot of the extraction data (gpm) and 1,4-dioxane concentrations for the period of January 2006 though January 2007 is provided as Attachment 4. Concentrations of 1,4-dioxane at TW-18 have declined since beginning its operation. The initial 1,4-dioxane concentration was 2,183 µg/L. On January 2, 2007, the 1,4-dioxane concentration at TW-18 was 917 µg/L.

WATER QUALITY - PERFORMANCE MONITORING WELLS

The December 2005 revised PMP proposed MW-70 and MW-71 be assigned performance criteria. PLS further proposed the wells used in water-level monitoring include TW-18, MW-30d, MW-64, MW-65s, MW-65i, MW-65d, MW-69, MW-71, MW-70, MW-72, MW-68, MW-94s, MW-94d, MW-95, MW-96, MW-106s, MW-106d, and Saginaw Forest Cabin #1 or #2. PLS proposed that extraction wells TW-18 and TW-12 (if used) also be monitored. PLS proposes that MW-108s and MW-108d be added to the list of PMP wells. Water-quality data and time-versus-concentration trend data for these wells are provided in Attachment 5.

PLS collected water samples from performance monitoring wells MW-70 in October 2006 and MW-71 in October 2006 and January 2007. 1,4-Dioxane concentrations at MW-70 remained nondetect at its October 26, 2006, sampling. As such, this well has met its performance standard.

WATER-LEVEL DATA

PLS collected water-level data from performance monitoring wells in February 2007 to include MW-108s and MW-108d. These data were used to construct a potentiometric surface map for the Unit E aquifer in the area of Wagner Road.

Data reports for all performance monitoring wells are provided in Attachment 5. Water-level data for the February 2007 sampling are provided in Table 2. Water-level data are discussed in the following section.

TW-18 CAPTURE ZONE INTERPRETATIONS

Analytical solutions, based on measured field data (aquifer performance testing and water-level measurements), have been used to estimate the approximate extent of the

TW-18 capture zone. Such methods can only approximate the site conditions, considering the complexity of the hydrogeology in the TW-18 area. PLS has not attempted to model the hydraulic conditions around TW-18 using a 3-dimensional groundwater flow model, nor does it believe such an analysis is necessary at this time. PLS believes the most representative interpretations of the extent of capture will be made through a combination of analytical calculations and review of water-level data collected during operation of TW-18. PLS has used a capture zone analytical solution to estimate the capture zone of TW-18. The supporting data for this calculation are provided in Attachment 6. The resulting solution was plotted onto the February 22, 2007, potentiometric surface map, and the resulting figure is shown as Figure 6. The calculated capture zone is consistent with February 22, 2007, measured water-level data. During this performance monitoring period, the water-level data suggest development to a hydraulic low in the area of MW-105d. This may suggest that operation of the WRIR is affecting the flow in this area. As demonstrated on Cross Sections A-A' and B-B', there is considerable aquifer thinning as you move south-southeast of TW-18. This negative boundary may be allowing for a more extensive capture in this direction than predicted by the analytical model.

The ability of TW-18 to capture the entire vertical extent of the Unit E plume has not been evaluated. There is nothing specific about the hydrogeological characteristics within the horizontal capture zone area that would suggest the entire vertical thickness of the aquifer is not being captured.

CONCLUSIONS

1. An analysis of available data suggest the Unit D2 plume may flow east and cross Wagner Road in the same area as Unit E. The Unit D2 plume then turns north, while the Unit E plume continues east. Previous interpretations of the Unit D2 plume suggested the plume migrates north of the Unit E plume in the Wagner Road area. Regardless of how the Unit D2 plume migrates through the Wagner Road area, it is PLS' position that the WRIR is meeting the court's order. TW-18 is likely to capture

more of the Unit D2 plume, if it is migrating (crossing Wagner Road) along a more southern route with the Unit E plume.

2. Analytical calculations of the TW-18 capture zone and field-measured data suggest TW-18, while operating at 200 to 220 gpm, along with other Unit E extraction wells, is capable of creating a capture zone sufficient to meet the designed objectives of the WRIR.

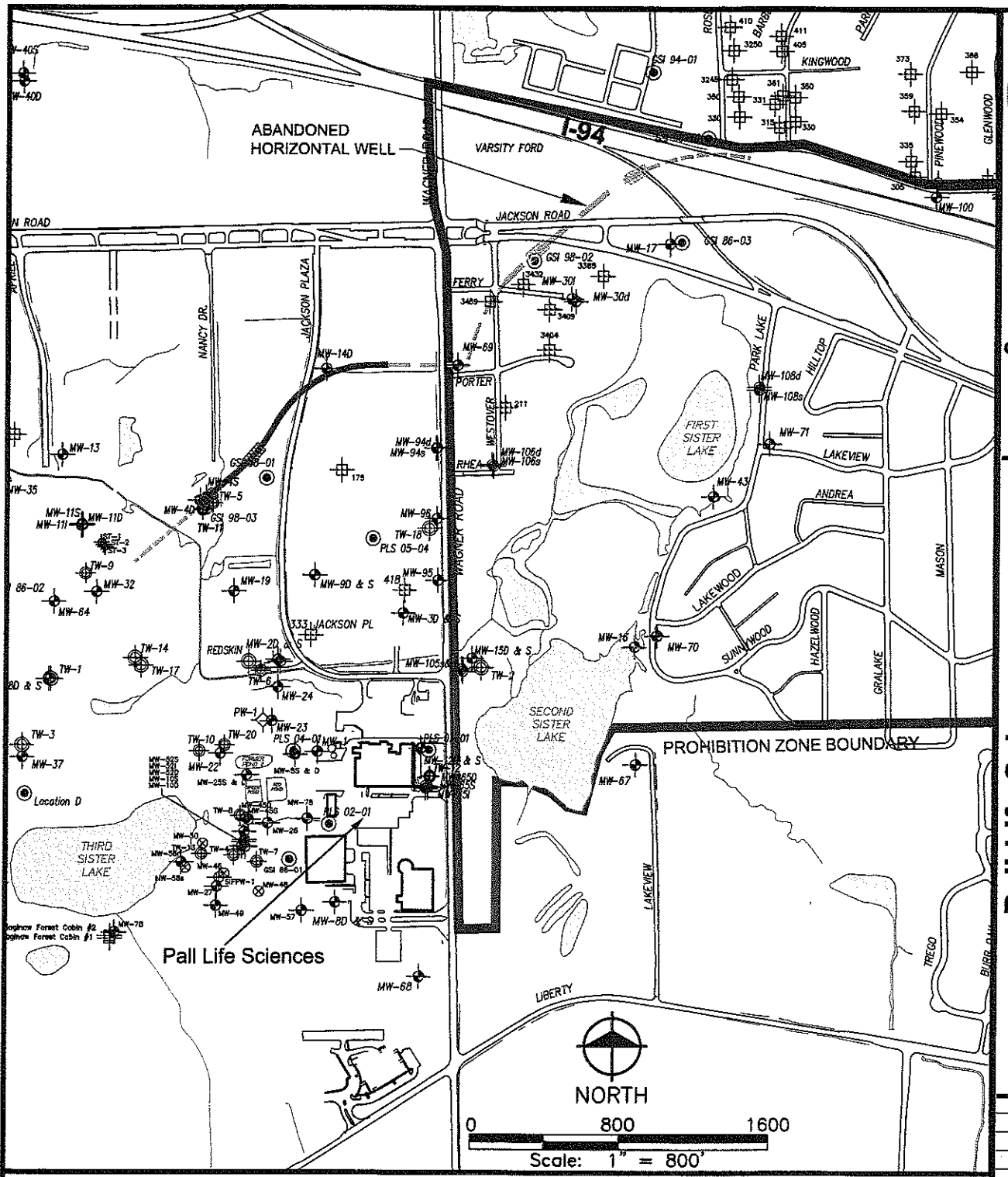
3. The ability of TW-18 to capture groundwater in the area of MW-105 has not been resolved. However, 1,4-dioxane in this area appears related to sources located southwest. Groundwater monitoring suggests TW-12 has been effective in reducing 1,4-dioxane levels to concentrations below 85 µg/L in areas upgradient of MW-105.

4. Establishing meaningful performance criteria for MW-71 and MW-108s/d will be extremely difficult given their distance from TW-18, uncertainties about the hydrogeological conditions under the First and Second Sister Lake area, and a very flat hydraulic gradient between the TW-18 area and these wells.

RECOMMENDATIONS

PLS recommends MW-108s and MW-108d be added to the list of performance monitoring wells for Wagner Road. PLS proposes making modifications to the previously submitted Revised Performance Monitoring Schedule included in the August 2006 Performance Review to reflect this addition. A newly revised schedule is provided in Attachment 7.

PLS is willing to discuss with the MDEQ possible performance criteria for WRIR performance monitoring wells, and would like to discuss the frequency for submittal of subsequent performance reviews.



LEGEND

- MONITOR WELL
- RESIDENTIAL WELL
- PURGE WELL
- HYDROGEOLOGIC TEST BORING
- TEMPORARY PURGE WELL
- HORIZONTAL WELL SCREEN

SITE MAP

fish 50 years

engineers
scientists
architects
constructors

Pall Life Sciences
Scio Twp., Washtenaw County, Michigan
Performance Review - Wagner Road Interim Response

PROJECT NO.
F96502

FIGURE NO.
1

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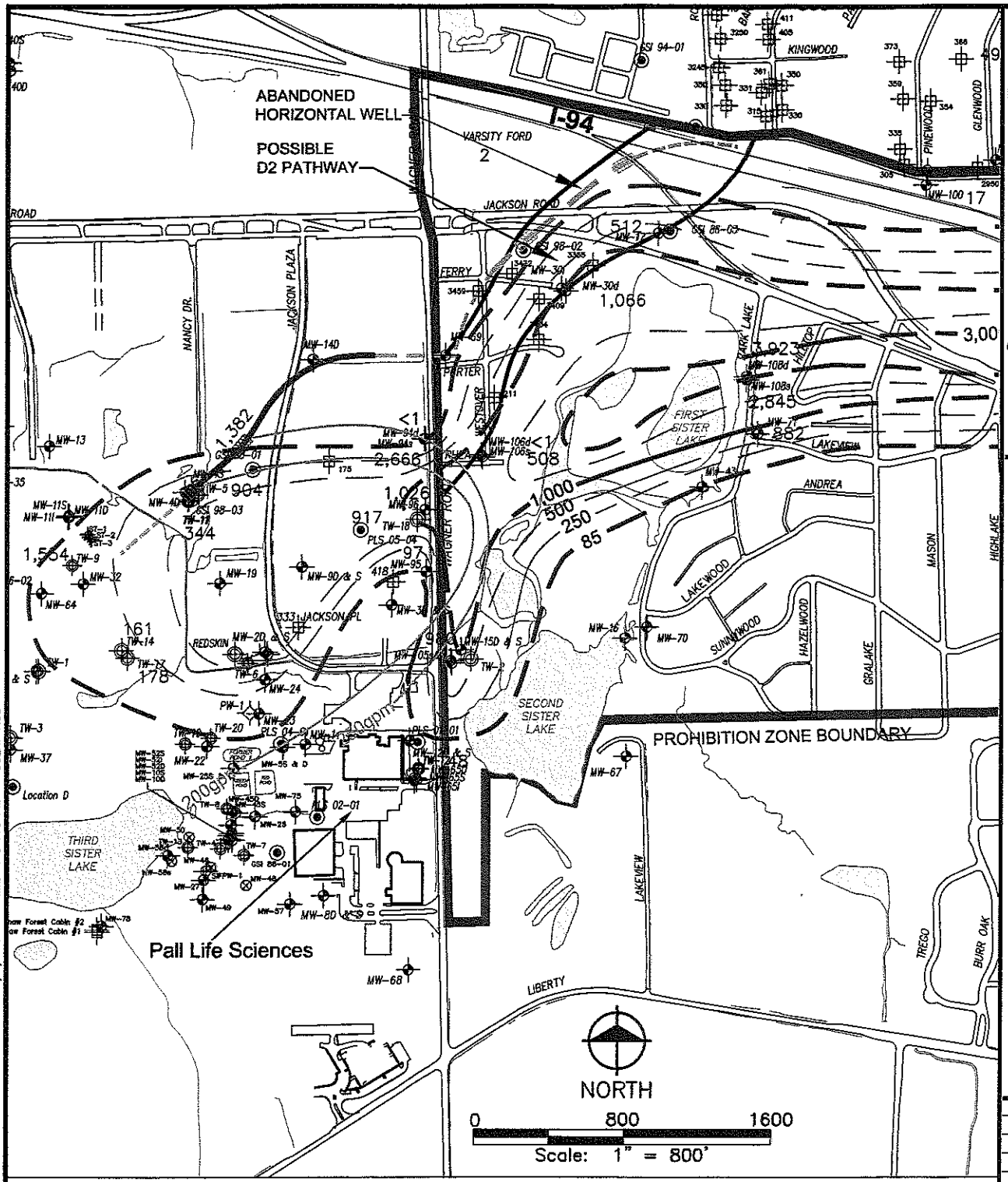

LEGEND

- MONITOR WELL
- RESIDENTIAL WELL
- PURGE WELL
- HYDROGEOLOGIC TEST BORING
- TEMPORARY PURGE WELL
- HORIZONTAL WELL SCREEN
- UNIT E 1,4-DIOXANE ISOCONCENTRATION CONTOUR (ug/L)
- 34 – 1,4-DIOXANE CONCENTRATION (ug/L)
- (184) – DATA NOT USED
- TW-18 CAPTURE ZONE (Calculated Using Model)

UNIT E

1,4-DIOXANE ISOCONCENTRATION CONTOUR MAP - January 2007 SHOWING TW-18 CAPTURE ZONE AND D_2 PATHWAY

fishbeck 50 years

engineers
scientists
architects
constructors

Pall Life Sciences
Scio Twp., Washtenaw County, Michigan
Performance Review - Wagner Road Interim Response

PROJECT NO.
F96502

FIGURE NO.
5

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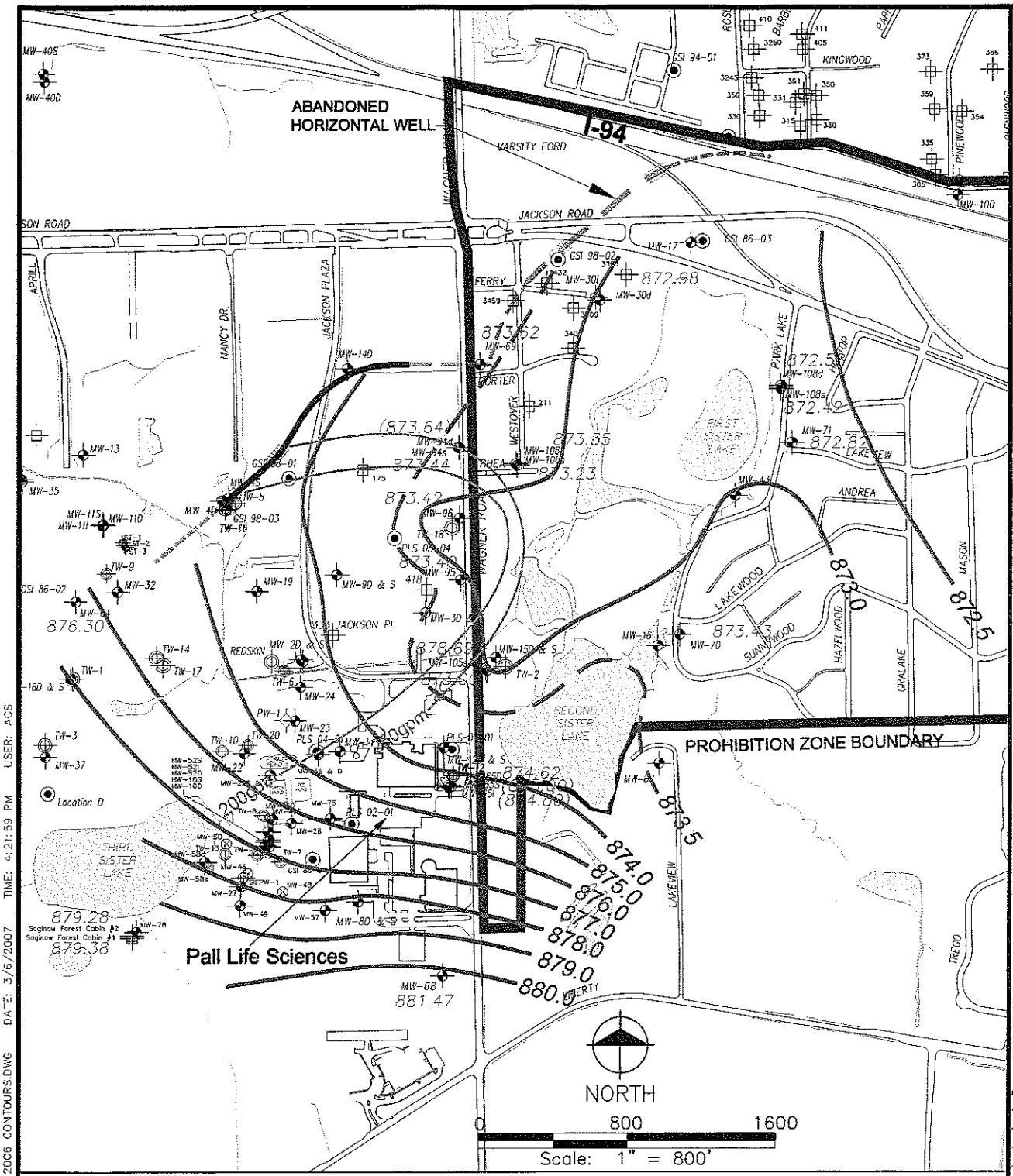

PUMP RATES @Feb. 22, 2007
TW-11 – 80 gpm
TW-12 – 20 gpm
TW-17 – 100 gpm
TW-18 – 205 gpm

LEGEND
- MONITOR WELL
- RESIDENTIAL WELL
- PURGE WELL
- HYDROGEOLOGIC TEST BORING
- TEMPORARY PURGE WELL
- HORIZONTAL WELL SCREEN
- POTENTIOMETRIC SURFACE CONTOUR (FEET AMSL)
870.02 – POTENTIOMETRIC SURFACE ELEVATION (FEET AMSL)
(880.89) – DATA NOT USED
- TW-18 CAPTURE ZONE (Calculated Using Model)

UNIT E
POTENTIOMETRIC SURFACE CONTOUR MAP
February 22, 2007

fteh 50 years

engineers
scientists
architects
constructors

Pall Life Sciences
Scio Twp., Washtenaw County, Michigan
Performance Review - Wagner Road Interim Response

PROJECT NO.
F96502

FIGURE NO.
6

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Table 1 - Well Drilling Analytical Results
Wagner Road Performance Review
February 2007

Sample ID	Sample Depth (ft bgs)	Date Received	Date Analyzed	Detection Limit (ppb)	1,4-Dioxane Results (ppb)
MW-108s and MW-108d					
PLS-06-13-10-13-06-1000	19-20.5	10/13/06	10/13/06	1.0	nd
PLS-06-13-10-13-06-1050	29-30.5	10/13/06	10/13/06	1.0	nd
PLS-06-13-10-13-06-1200	49-50.5	10/13/06	10/13/06	1.0	nd
PLS-06-13-10-16-06-1200	59-60.5	10/16/06	10/16/06	1.0	nd
PLS-06-13-10-16-06-1320	89-90.5	10/16/06	10/16/06	1.0	138
PLS-06-13-10-16-06-1410	99-100.5	10/16/06	10/16/06	1.0	61
PLS-06-13-10-16-06-1500	109-110.5	10/16/06	10/16/06	1.0	1,984
PLS-06-13-10-16-06-1550	119-120.5	10/17/06	10/17/06	1.0	2,171
PLS-06-13-10-16-06-1625	129-130.5	10/17/06	10/17/06	1.0	2,781
PLS-06-13-10-16-06-1715	139-140.5	10/17/06	10/17/06	1.0	2,022
PLS-06-13-10-17-06-0850	149-150.5	10/17/06	10/17/06	1.0	2,689
PLS-06-13-10-17-06-1230	179-180.5	10/17/06	10/17/06	1.0	3,429
PLS-06-13-10-18-06-0850	219-220.5	10/18/06	10/18/06	1.0	120

Notes:
ft bgs = feet below ground surface
ppb = parts per billon = µg/L

PALL Life Sciences

Table 2 – Wagner Road Water Level Data
Wagner Road Performance Review
February 22, 2007

Well Name	Static Reading (ft bgs)	TOC (ft amsl0	SWL (ft amsl)	Static Time
MW-30d	64.62	937.6	872.98	11:12
MW-64	55.29	931.59	876.3	9:12
MW-65s	54.43	929.43	875	9:26
MW-65i	54.55	929.35	874.8	9:36
MW-65d	54.35	928.97	874.62	9:38
MW-66	34.53	911.73	877.2	9:15
MW-67	51.92	925.42	873.5	10:10
MW-68	64.27	945.74	881.47	9:42
MW-69	48.49	922.11	873.62	10:45
MW-70	38.53	911.96	873.43	11:37
MW-71	41.39	914.21	872.82	11:24
MW-72s	71.34	942.95	871.61	14:50
MW-72d	71.54	942.52	870.98	14:55
MW-94s	45.12	918.56	873.44	11:06
MW-94d	45.1	918.74	873.64	11:01
MW-95	42.05	915.45	873.4	10:25
MW-96	53.94	927.36	873.42	10:30
MW-105s	33.28	911.97	878.69	10:20
MW-105d	38.62	911.62	873	10:17
MW-106s	49.66	922.89	873.23	10:54
MW-106d	49.17	922.52	873.35	10:57
MW-108s	38.07			11:22
MW-108d	38.24			11:20
TW-18	73.97	929.06	855.09	10:40
Saginaw Forest Cabin #1	34.54	913.92	879.38	9:55
Saginaw Forest Cabin #2	32.3	911.58	879.28	15:20

Notes:
TOC = top of casing
SWL = static water level
ft bgs = feet below ground surface
ft amsl = feet above mean sea level

PALL Life Sciences

	TW-18		Wagner Road Area		
Q (gpm)	Q (ft3/day)	gradient = i	T = bK (ft2/day)	b (feet)	K (ft/day)
250	48125	0.00105	20,000	100	200

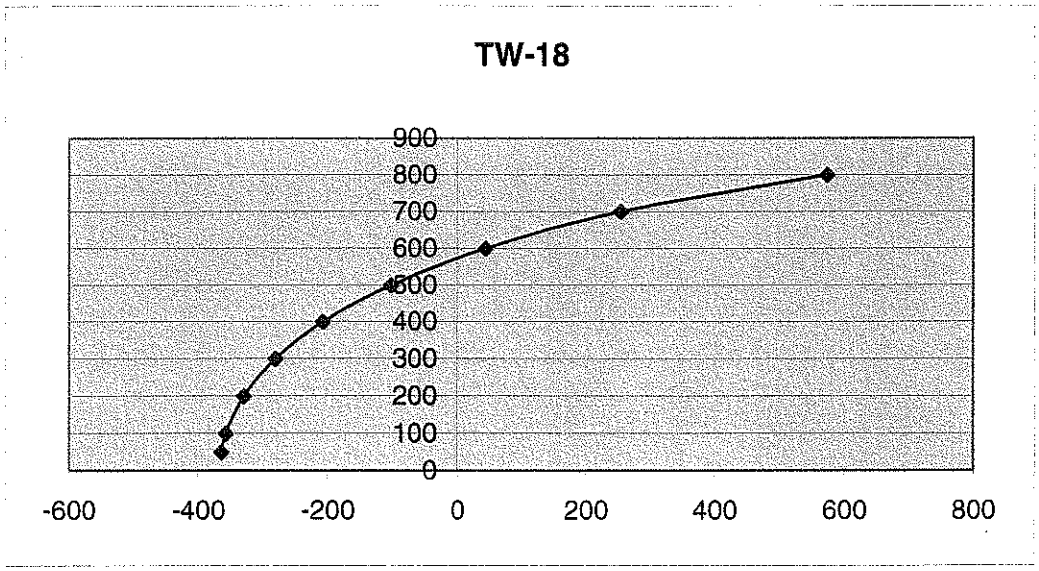
X (feet)	Y (feet)	**Ymax (ft)**	**stagnation pt**
-362.443	50	**1145.833**	**-364.730386**
-355.545	100		
-327.419	200		
-278.512	300		
-205.252	400		
-101.314	500		
44.635	600		
254.275	700		
574.279	800		

FORMULA

Y max = + or - Q / 2 b K i

stagnation pt = Xo = -(Q / 2 pi K b i)

shape of curve
X = - Y / Tan (2 pi K b i / Q)
tangent must be in radians



	TW-18		Wagner Road Area		
Q (gpm)	Q (ft3/day)	gradient = i	T = bK (ft2/day)	b (feet)	K (ft/day)
200	38503	0.00105	20,000	100	200

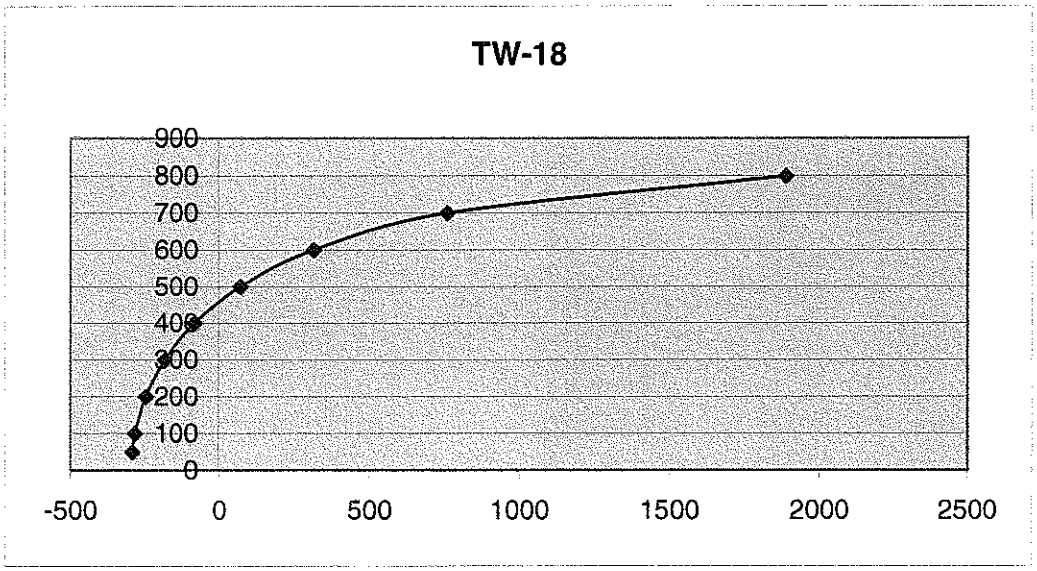
X (feet)	Y (feet)	**Ymax (ft)**	**stagnation pt**
-288.946	50	**916.738**	**-291.8070452**
-280.294	100		
-244.617	200		
-180.940	300		
-81.095	400		
71.820	500		
316.463	600		
762.411	700		
1891.888	800		

FORMULA

Y max = + or - Q / 2 b K i

stagnation pt = Xo = -(Q / 2 pi K b i)

shape of curve
X = - Y / Tan (2 pi K b i / Q)
tangent must be in radians



REVISED ATTACHMENT 1 (March 2007)
PERFORMANCE MONITORING - WAGNER RD
UNIT E AQUIFER

Well I.D	Groundwater Quality Frequency (for first two years of Wagner Road Interim Response operation)	Water Level Frequency (for first two years of Wagner Road Interim Response operation)
Wells with specific performance criteria assigned		
MW-70	Quarterly	Quarterly
Other Performance Monitoring Wells		
MW-30d	Quarterly	Quarterly
MW-64	Quarterly	Quarterly
MW-65s	Quarterly	Quarterly
MW-65i	Quarterly	Quarterly
MW-65d	Quarterly	Quarterly
MW-69	Quarterly	Quarterly
MW-71	Quarterly	Quarterly
MW-72	Quarterly	Quarterly
MW-68	Quarterly	Quarterly
MW-94s	Quarterly	Quarterly
MW-94d	Quarterly	Quarterly
MW-95	Quarterly	Quarterly
MW-96	Quarterly	Quarterly
MW-106s	Quarterly	Quarterly
MW-106d	Quarterly	Quarterly
MW-105d	Quarterly	Quarterly
MW-108s	Quarterly	Quarterly
MW-108d	Quarterly	Quarterly
Saginaw Forest Cabin #1 or #2	Quarterly	Quarterly
Extraction wells to be monitored		
TW-18	Monthly During Extraction	Not Measured
TW-12 (if used)	Monthly During Extraction	Not Measured

Note: After two years, PLS will propose a modification to these monitoring frequencies.
Will be discussing potential performance criteria with MDEQ