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EXTRA INFORMATION EXTRA INFORMATION

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August 27, 2009

Mr. Derrick Golden
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U.S. Environmental Protection Agency
Region I
1 Congress Street, Suite 1100
Boston, MA 02114-2023

Ms. Jennifer McWeeney
Bureau of Waste Site Cleanup
Massachusetts Department of
Environmental Protection
One Winter Street, 7th Floor
Boston, MA 02108

RE: Response to Comments on Landfill Area Groundwater Pre-Design Results Report, W. R. Grace Superfund Site, Acton, Massachusetts

Dear Mr. Golden and Ms. McWeeney:

This letter provides responses to the USEPA comments included in the June 9, 2009 letter RE: Conditional Approval of the Draft Landfill Area Groundwater Pre-Design Results Report, dated April 2009. No responses to the USEPA comments on Section 4 – Landfill Area Groundwater Modeling are provided in this letter because USEPA indicated that these comments do not need to be addressed at this time since it has been determined that the model alone will not be used as the sole basis for demonstrating appropriate capture.

General Comment Regarding Capture Zones and the Need for Additional Data Collection

- Collect additional round(s) of water level data this summer (in monitoring wells used for the pumping test - at a minimum those listed in Table 3-2 of the report).
- Use the data to generate potentiometric surfaces and estimate capture zones for overburden and bedrock.
- Use these data, rather than the model-predicted capture zones, to determine if additional extraction wells may be needed in order to obtain the ROD specified capture zone.
- Base treatment system design on a flow rate that can accommodate the existing pumping rates plus an additional safety factor to allow for additional extraction wells to be added, should this be proved to be necessary.

In order for Grace to demonstrate that the groundwater quality outside the capture zone is clean/relatively clean, it may be necessary to obtain groundwater quality data from additional wells that are not part of the annual groundwater monitoring program. The annual groundwater monitoring program only includes select wells and there are many other wells that are not monitored on a regular basis. EPA and MassDEP reserve the right to require additional groundwater quality data to be obtained, should it become necessary.

Also, if it turns out that the existing network of monitoring wells is not adequately situated or otherwise has a gap preventing a determination from being made about groundwater quality outside the capture

zone, then additional groundwater monitoring wells may need to be installed. EPA and MassDEP reserve the right to require additional monitoring wells to be installed, should it become necessary.

We also discussed that installing additional extraction well(s) may be found to be necessary in the future based on water level measurement and contaminant monitoring data. EPA and MassDEP request that when the potentiometric maps are being prepared and captures zones are being estimated (second bullet above), consideration be given to depict how vertical potentiometric differences in the landfill area affect the groundwater flow regime (such as by preparing separate shallow and deep overburden potentiometric maps or by preparing hydrogeologic cross sections in critical areas).

> ***Response:*** *Grace will collect the annual Site-wide water level round this summer and use the data to evaluate the Landfill Area capture zone. A letter report summarizing the capture zone evaluation will be prepared and submitted to USEPA in early Fall. The letter report will include recommendations, if any, for changes to the monitoring program or the need for additional monitoring and/or extraction wells.*
>
> *The groundwater treatment system included in the Concept Design for the Landfill Area will accommodate the existing pumping rates plus an additional safety factor to allow for additional extraction well(s), should they be needed.*

Specific Comments on Sections 1 through 4

1. Page 2-2, Section 2.3 Extraction System Reconfiguration, second paragraph. According to information presented in the Initial Site Characterization Report (HSI GeoTrans, August 1998), the original yields of MLF and WLF were both about 33-34 gpm. While the yield of MLF following redevelopment was about the same, the yield of WLF (9-10 gpm) was considerably lower. Please provide information regarding the yield or specific capacity of WLF before redevelopment; if additional redevelopment is needed in the future, the results of this relatively unaggressive redevelopment program will be useful for planning future activities.

   > ***Response:*** *Extraction well WLF has routinely been redeveloped twice per year. During the most recent redevelopment, in November 2008, the extraction rate in WLF increased from 8.5 to 9.5 gpm. Grace is planning to redevelop all four Landfill Area extraction wells in July or August of 2009 prior to collecting the Site-wide water level round.*

2. Page 4-7, Section 4.2 Landfill Area Capture Zone Evaluation, second paragraph. The particle tracking shown on Figures 4-7 through 4-10, while useful for envisioning the groundwater movement in the capture zone, would be complemented by figures showing the capture zones of the individual extraction wells in each model layer. Figures 3-2 through 3-6, in Appendix A of the Public Review Draft Remedial Investigation Report (GeoTrans, July 2005), are an example of the type of presentation that would be useful in understanding the flow dynamics. Please provide figures that show the individual extraction well capture zones in each layer, using figures similar to those presented in the RI report. The groundwater contour maps should include arrows and dashed lines depicting groundwater flow directions and extent of the capture zone. The maps should depict the ROD-required capture zone and the benzene and arsenic plumes, so that a simple comparison can be made between the current capture zone, the contamination mass, and the ROD-required capture zone.

   > ***Response:*** *Figures 1 through 4, attached, show the model-calculated capture zones for each of the four Landfill Area groundwater extraction wells for model layers 2 through 5, respectively. Also shown on each of the figures is the ROD specified capture zone, arrows illustrating directions of groundwater flow and the benzene plume for model layers 2 through*

5, respectively. The benzene plumes on Figures 1 through 4 were drawn based on groundwater quality results from wells completed in the respective model layer.

Figure 1 shows the four individual model layer 2 capture zones, that combined, make up the model-calculated Landfill Area capture zone that was depicted on Figures 4-7, 4-11, and 4-17 of the "Landfill Area Groundwater Pre-Design Results Report". Figure 1 shows that groundwater with the highest benzene concentrations in model layer 2, up to 1,800 µg/L, is located within the SELF-1 and MLF capture zones. Arrows illustrate the flow of groundwater within the WLF, MLF and SELF-1 capture zones toward each extraction well. Flow arrows are not depicted in the layer 2 capture zone for SWLF-1 because groundwater flow in that area would be downward through the till and into SWLF-1.Figure 2, which illustrates the individual capture zones and benzene plume for model layer 3, shows that benzene contamination is more widespread in model layer 3, but concentrations are significantly lower. The maximum benzene concentration detected in 2008 in a monitoring well completed in model layer 3 was 56 µg/L (see Figure 4-18 in the "Landfill Area Groundwater Pre-Design Results Report" for model layer 3 monitoring well concentrations). Figures 3 and 4, which illustrate the individual capture zones and benzene plumes for model layers 4 and 5, show that benzene contamination in model layers 4 and 5 is located further west, within the SWLF-1 and MLF capture zones. The maximum benzene concentration detected in 2008 in a monitoring well completed in model layer 4 or 5 was 61 µg/L (see Figure 4-19 and 4-20 in the "Landfill Area Groundwater Pre-Design Results Report" for model layer 4 and 5 monitoring well concentrations).

As discussed in Section 3.5.3.3 of the Public Review Draft Remedial Investigation Report (GeoTrans, 2005), wells downgradient of the Industrial Landfill with elevated arsenic concentrations are generally associated with the region of groundwater containing elevated benzene concentrations. Grace plans to propose additional groundwater sampling to better define the current distribution of arsenic in groundwater downgradient of the Landfill Area.

3. Possible cross-flow in SWLF-1: The report indicates extraction well SWLF-1 is screened across 11 feet of the overburden, as well as 43 feet of open bedrock. Grace should clarify if any precautions are being made to assure that cross-flow is not occurring when the pump is not in operation. Along these same lines, Grace should clarify if the pump in SWLF operates continuously or cycles on and off (i.e., potentially allowing cross-flow to occur).

***Response:** SWLF-1 is not screened across the unconsolidated deposit. However, as stated in Section 2.1 and shown on Figure 2-1, the sand pack around the screen was extended 11 feet above the bedrock surface to enhance capture of contaminated groundwater in the deep unconsolidated deposits. No precautions are being made to assure that cross-flow is not occurring as both the deep unconsolidated deposits and shallow bedrock are contaminated and the well was specifically designed to enhance capture of the deep unconsolidated deposits groundwater. Across the Site there are no barriers to flow between the unconsolidated deposits and bedrock and consequently, many wells are screened across multiple units. The pump in SWLF-1 operates continuously.*

Specific Comments on Section 5 – Treatability and Toxicity Testing

1. Page 5-3, Section 5.1.1 Testing Procedures, first full paragraph. This paragraph discusses the anomalous result for lead in the effluent sample (the result reported on Table 5-3), and notes that analyses of effluent performed by Siemens did show detectable lead. Please clarify how the lead results reported in Table 5-3 were analyzed; did Siemens generate effluent and have the samples sent to an outside laboratory identified by GeoTrans, while also analyzing some samples

internally? Perhaps there is some relationship between the use of different methods/laboratories and the anomalous lead results. It is agreed that the lead detected in the one effluent sample is anomalous (as lead concentrations should not be increased by treatment) and that lead is not likely a concern for discharge of treated effluent to Sinking Pond, but the text as presented is not clear on who performed analyses on what samples. It is also interesting to note that the results presented in Table 5-3 show a higher reported concentration for dissolved lead than for total lead in the treated effluent sample. This is also anomalous and may indicate some problem at the laboratory or with the sampling equipment causing trace lead contamination.

Response: *The lead results reported in Table 5-3 were from samples generated by Siemens and sent to Columbia Analytical where they were analyzed following procedures defined in the project QAPP. Sample results reported by Siemens in Attachment D were analyzed by Siemens as part of their internal testing.*

2. Attachment D, Treatability Test Report – Page 12 Regarding Odor. This section notes that odor was "reduced" (not eliminated) during treatment. No mention of odor is included in Section 5.0 however. Please indicate whether odor is expected to be a concern at full scale and whether additional treatability testing might be necessary to evaluate alternative means of odor control. The question of odor control will need to be addressed in the next submittal (the Concept Design). The jar tests were designed to optimize metals removal, as is appropriate since metals removal is the primary purpose of the chemical precipitation treatment. However, odor control is a secondary objective of the treatment and bench testing to establish treatment conditions that can eliminate odor may be warranted prior to advancing to the Concept Design stage. If permanganate treatment alone is not able to eliminate odor, it is possible that some other technology will be needed.

Response: *It is expected that air stripping combined with metals precipitation will significantly reduce, if not completely eliminate, any odors associated with the groundwater. The need for additional odor controls will be evaluated once the new system is operational.*

3. Metals flocculation: Toxicity testing results indicate that treated groundwater has no chemical toxicity and, therefore, would not pose a risk of harm to ecological receptors that are exposed to it. However, it isn't clear if the redox potential of the treated groundwater was evaluated. Historically, the discharge of groundwater into Sinking Pond has resulted in significant metals precipitation. MassDEP is concerned about a potential increase in metals flocculation, to a point where a condition of "readily apparent harm" to ecological receptors could be triggered. Grace should evaluate the potential for additional metals flocculation.

Response: *Metals flocculation is not expected to be an issue because, unlike the existing system, the new treatment system will precipitate metals prior to discharge to Sinking Pond.*

4. Arsenic discharge limit evaluation: Page 5-4 of the report indicates that the final arsenic discharge limit will not be established until after the treatment system has been running and optimized for approximately two years. Please clarify why it will take two years of operation to complete this evaluation.

Response: *As specified in footnote 1 of Attachment 1 to the December 14, 2006 letter "Subject: Final limits for effluent discharge from Sinking Pond from Treatment System" from Remedium to USEPA and MassDEP, the arsenic limit will be established within 2 years of the startup of the treatment system. This time period was specified to allow sufficient time to optimize the treatment system and determine the arsenic concentration that can be attained on a consistent basis in order to set a final limit for arsenic.*

If you have any questions regarding these responses please call me at (978) 952-0120.

Sincerely,

Anne Benjamin Sheehan
Project Manager

cc: Lydia Duff, W. R. Grace
Dave Fuerst, O & M
Jack Guswa, JG Environmental
Thor Helgason, de maximis
Seth Jaffe, Foley Hoag
Maryellen Johns, Remedium
Bob Medler, Remedium

ABS

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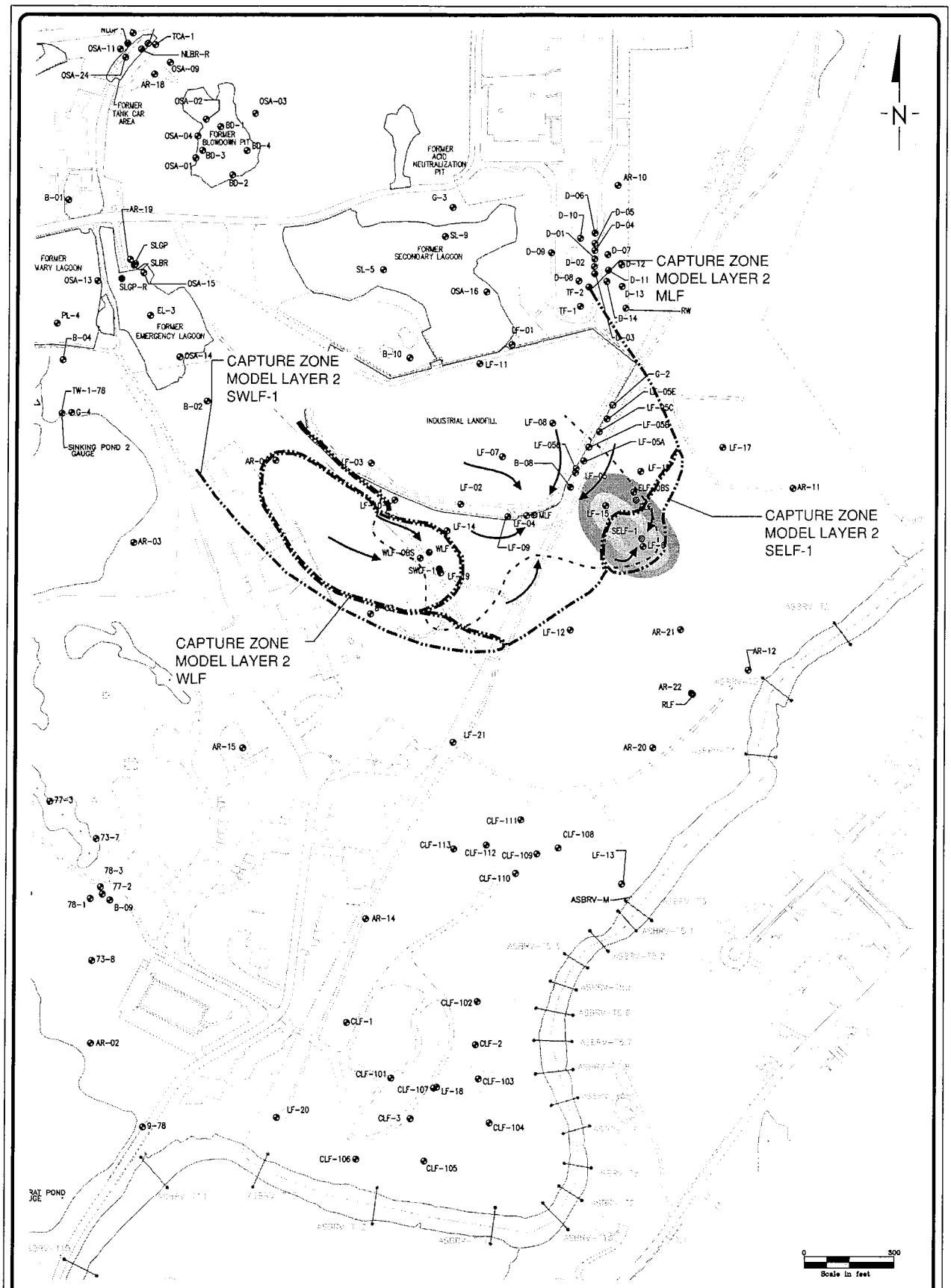
Jul 16 , 2009 - 11:17am



EXPLANATION

- FORMER SOURCE AREA
- R-2 MONITORING WELL (SINGLE OR CLUSTER)
- RP-1 EXTRACTION WELL
- ASSABET 1 PUBLIC WATER SUPPLY WELL
- RIVER TRANSECT
- LAYER 2 GROUNDWATER FLOW ARROW BASED ON MODEL-CALCULATED PARTICLE TRACKS
- ROD CAPTURE ZONE

BENZENE CONCENTRATION 2008 (LAYER 2)

- 1001-1800 ug/L BENZENE
- 101-1000 ug/L BENZENE
- 31-100 ug/L BENZENE
- 5-30 ug/L BENZENE

SAMPLES COLLECTED BETWEEN AUG. 13 AND NOV. 5, 2008

TITLE: 2008 BENZENE PLUME WITH MODEL-CALCULATED CAPTURE ZONE AT EACH PUMPING WELL, MODEL LAYER 2

LOCATION: W.R.Grace, Acton, MA.

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DATE	JULY 2009

FIGURE: 1

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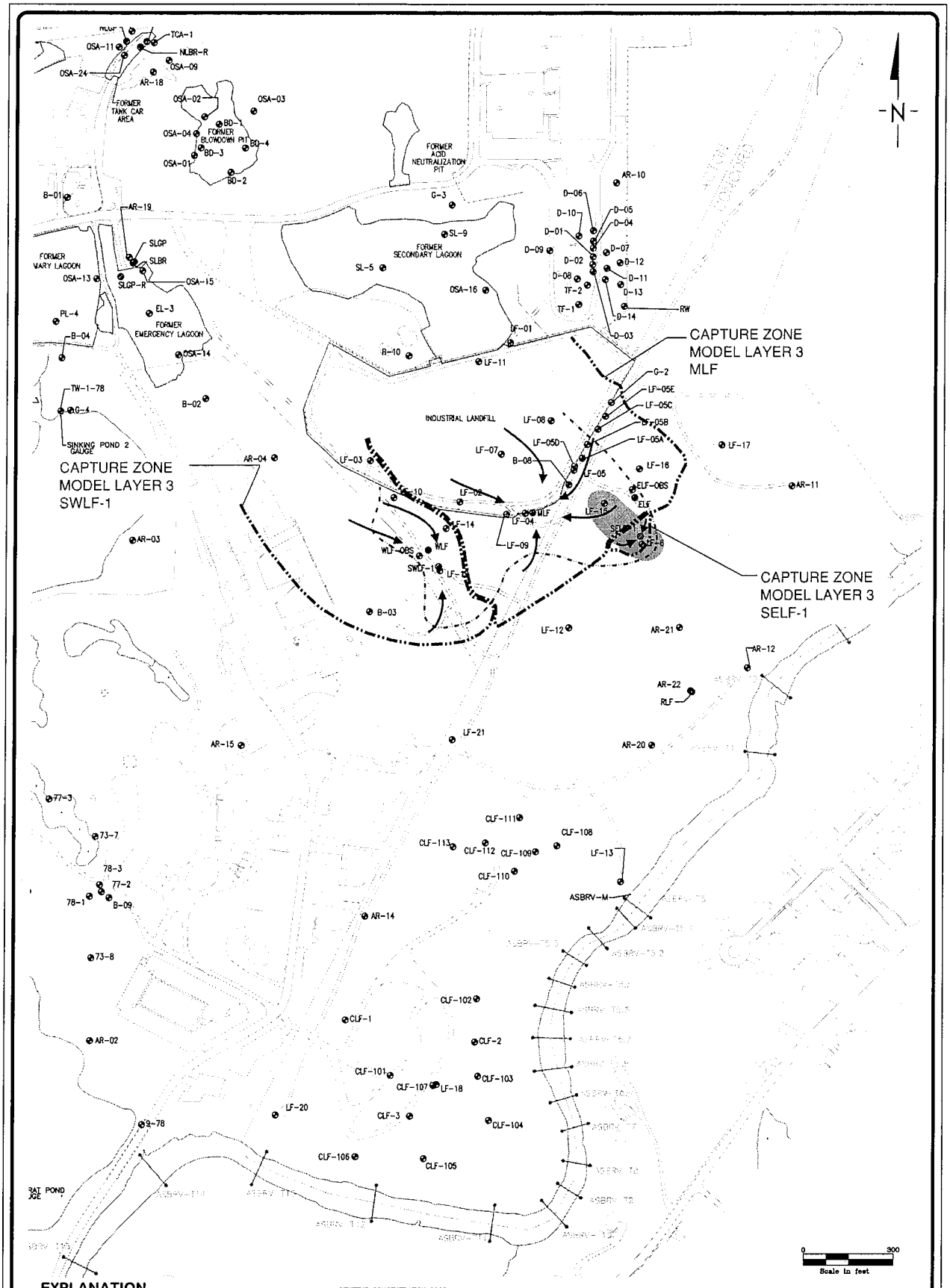
Jul 16 , 2009 - 11:18am



EXPLANATION

- FORMER SOURCE AREA
- R-2 MONITORING WELL (SINGLE OR CLUSTER)
- RP-1 EXTRACTION WELL
- ASSABET 1 PUBLIC WATER SUPPLY WELL
- RIVER TRANSECT
- LAYER 3 GROUNDWATER FLOW ARROW BASED ON MODEL-CALCULATED PARTICLE TRACKS
- ROD CAPTURE ZONE

BENZENE CONCENTRATION 2008 (LAYER 3)

- 31-100 ug/L BENZENE
- 5-30 ug/L BENZENE

SAMPLES COLLECTED BETWEEN AUG. 13 AND NOV. 5, 2008

TITLE: 2008 BENZENE PLUME WITH MODEL-CALCULATED CAPTURE ZONE AT EACH PUMPING WELL, MODEL LAYER 3

LOCATION: W.R.Grace, Acton, MA.

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DATE	JULY 2009

FIGURE: 2

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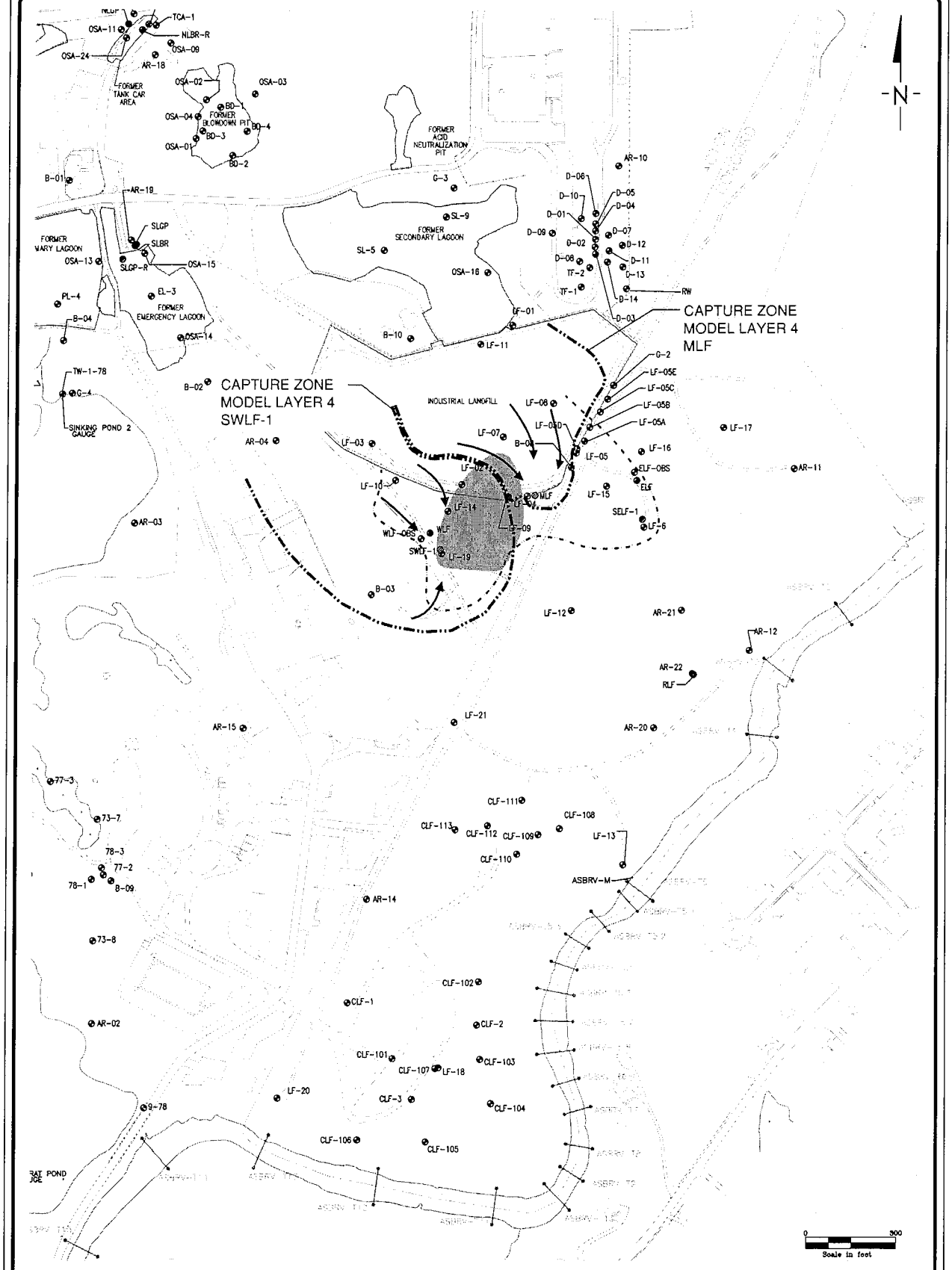

EXPLANATION

- FORMER SOURCE AREA
- R-2 MONITORING WELL (SINGLE OR CLUSTER)
- RP-1 EXTRACTION WELL
- ASSABET 1 PUBLIC WATER SUPPLY WELL
- RIVER TRANSECT
- LAYER 4 GROUNDWATER FLOW ARROW BASED ON MODEL-CALCULATED PARTICLE TRACKS
- ROD CAPTURE ZONE

BENZENE CONCENTRATION 2008 (LAYER 4)

- 31-100 ug/L BENZENE
- 5-30 ug/L BENZENE

SAMPLES COLLECTED BETWEEN AUG. 13 AND NOV. 5, 2008

TITLE: 2008 BENZENE PLUME WITH MODEL-CALCULATED CAPTURE ZONE AT EACH PUMPING WELL, MODEL LAYER 4

LOCATION: W.R.Grace, Acton, MA.

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DATE	JULY 2009

FIGURE: 3

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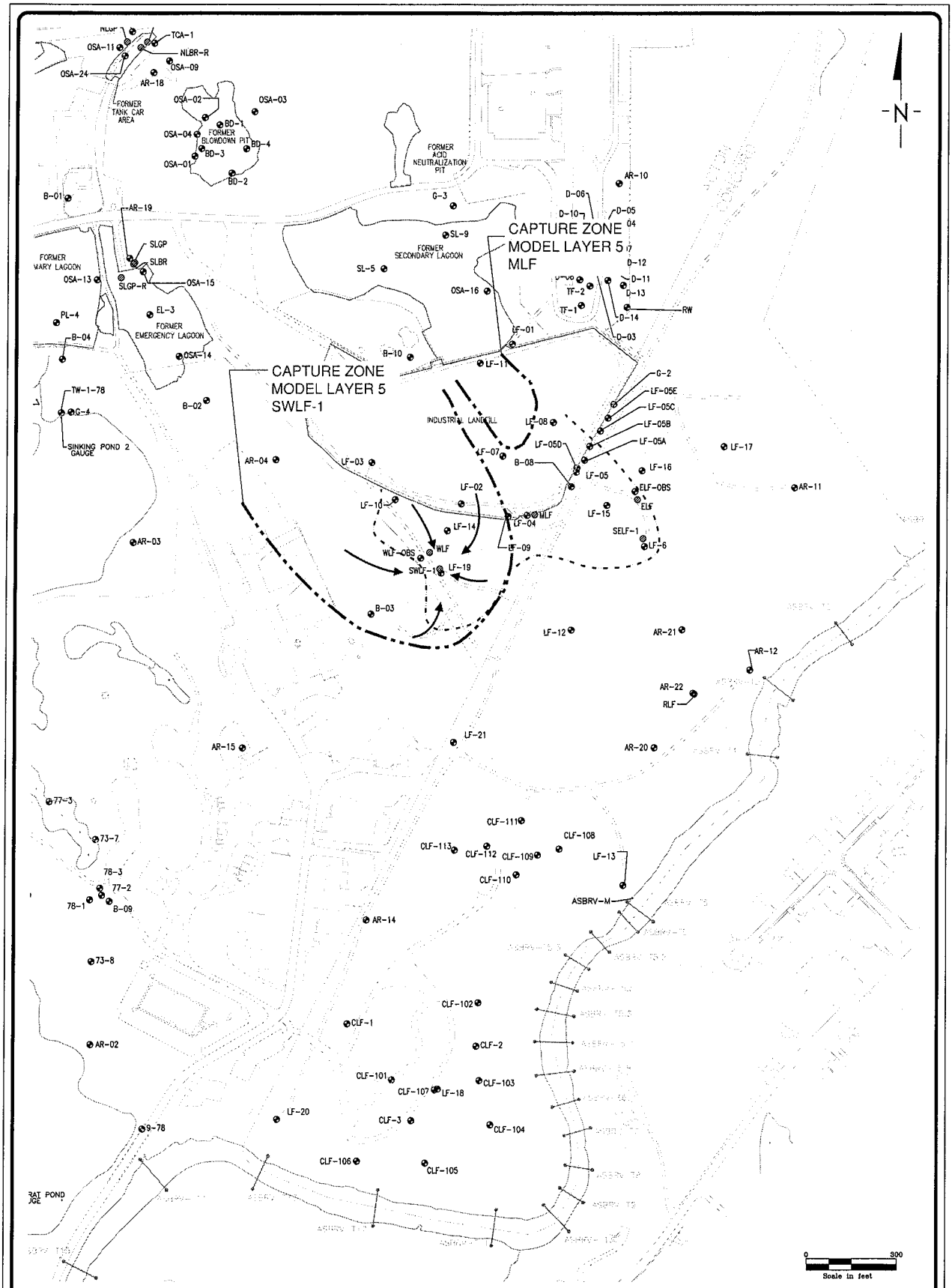

EXPLANATION

- FORMER SOURCE AREA
- R-2 MONITORING WELL (SINGLE OR CLUSTER)
- RP-1 EXTRACTION WELL
- ASSABET 1 PUBLIC WATER SUPPLY WELL
- RIVER TRANSECT
- LAYER 5 GROUNDWATER FLOW ARROW BASED ON MODEL-CALCULATED PARTICLE TRACKS
- ROD CAPTURE ZONE

BENZENE CONCENTRATION 2008 (LAYER 5)

5-30 ug/L BENZENE

SAMPLES COLLECTED BETWEEN AUG. 13 AND NOV. 5, 2008

TITLE: 2008 BENZENE PLUME WITH MODEL CALCULATED CAPTURE ZONE AT EACH PUMPING WELL, MODEL LAYER 5

LOCATION: W.R.Grace, Acton, MA.

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DATE	JULY 2009

FIGURE: 4