

STATE OF MICHIGAN

IN THE CIRCUIT COURT FOR THE COUNTY OF WASHTENAW

THE ATTORNEY GENERAL FOR THE  
STATE OF MICHIGAN, ex rel, MICHIGAN  
NATURAL RESOURCES COMMISSION,  
MICHIGAN WATER RESOURCES  
COMMISSION and MICHIGAN  
DEPARTMENT OF ENVIRONMENTAL  
QUALITY,

Case Number: 88-34734-CB  
Hon. Honorable Donald E. Shelton

Plaintiffs,

v.

GELMAN SCIENCES, INC.,

Defendant.

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**MEMORANDUM OF THE CITY OF ANN ARBOR REGARDING  
PROPOSED AMENDMENTS TO JULY 17, 2000  
“OPINION AND REMEDIATION ENFORCEMENT ORDER”**

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At the September 8, 2004 Status Conference, the Court stated that it would modify its July 17, 2000 “Opinion and Remediation Enforcement Order” (the “2000 Order”) to resolve an impasse that has been reached regarding proposed remedial efforts for the Unit E Plume.<sup>1</sup> The Court directed the State of Michigan and Gelman Sciences, Inc., d/b/a Pall Life Sciences (“PLS”) to provide memoranda to help the Court devise modifications to the 2000 Order. In addition, the Court indicated that it would accept input for that purpose from the City of Ann Arbor. Accordingly, Ann Arbor submits this memorandum for the Court’s consideration.

The basic disagreement which led to the impasse concerns the degree to which PLS will be required to actually conduct a cleanup of its Unit E Plume. PLS proposes to perform only limited cleanup and would allow groundwater containing less than 2,800 ppb of 1,4-dioxane to migrate under the City until it reaches and discharges to the Huron River. Conversely, MDEQ’s Decision Document determined that contamination in the Unit E Plume must be extracted and cleaned, using extraction wells at Wagner Road, at Maple Road and at the so-called Leading Edge, along with treatment systems and a pipeline to the River, to discharge treated water. MDEQ stated that its Decision could be modified slightly, to allow the portion of the Plume that had already passed by Maple Road to migrate untreated to the River, but only if several enumerated conditions were satisfied. Included in those conditions were: (i) an enforceable institutional control, e.g. an ordinance, must be adopted to prohibit groundwater use; (ii) the City’s Northwest Supply Well must be abandoned; and (iii) measures must be taken to protect existing downgradient supply wells. Ann Arbor agrees that PLS’s proposal is unacceptable. MDEQ’s approach is appropriate, with one caveat. As explained below, it is premature to

determine the appropriate solution to the Leading Edge contamination.

First, if PLS's approach is allowed, virtually no remediation would be required in the Unit E Plume. The only known monitoring well in the Unit E Plume where 1,4-dioxane concentrations exceed 2,800 ppb is MW-72, which is located at the Michigan Inn, just west of the I-94 expressway. According to PLS, by the time that groundwater migrates to the Huron River, the concentration of 1,4-dioxane will have diluted to the point that it will not exceed the 2,800 ppb limit applicable to the groundwater/surface water interface. Accordingly, PLS suggests it is appropriate to allow most of that plume to simply migrate under the City, contaminating a currently pristine aquifer, until it reaches the river. That approach is unacceptable. Significant uncertainty exists as to the pathway this Plume will follow as it migrates. Moreover, huge volumes of highly contaminated groundwater can be stopped and remedied before it reaches the Maple Road area, thereby accelerating a real cleanup and reducing the extent to which the groundwater under the City will be polluted. There is no reason to allow PLS to escape responsibility for conducting an actual cleanup.

Second, Ann Arbor agrees with the MDEQ Decision Document that would require extraction and treatment of groundwater at Wagner Road and at Maple Road, and the subsequent discharge through a pipeline to the river. However, it is premature to decide how to address the Leading Edge until the effectiveness of the other extraction wells are proven and a proper computer model is developed to determine their effect on downgradient migration of the portion of the plume that has moved past those locations.

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<sup>1</sup> The Unit E Plume of 1,4-dioxane was discovered after the 2000 Order was entered.

Accordingly, Ann Arbor believes that PLS should be required to implement the remedial actions outlined in this memorandum, which generally parallel those required by MDEQ's Decision Document. This will include a final determination of Leading Edge issues after the effectiveness of blocking/extraction wells at Wagner and Maple Roads have been fully assessed.

As the Court is well aware, much has changed since entry of the Court's 2000 Order. A completely new and unanticipated plume of contamination – the Unit E Plume was discovered. There remain multiple plumes of 1,4-dioxane contamination that have migrated from the PLS property on Wagner Road, in a variety of directions. At this point in time, it appears that there are five main, “known” areas or units of contamination: (1) the Core Area; (2) the Western Plume; (3) the Evergreen Plume; (4) the Southwest Property area; and (5) the new “Unit E” Plume, which is migrating easterly in a very deep aquifer toward the heart of Ann Arbor. Although all areas of this contamination are interconnected and ultimately must be addressed by PLS, the City's comments will focus principally on achieving concentrations appropriate for drinking water [Hopefully, the 3 ppb Maximum Contaminant Level (MCL) advocated by Ann Arbor] in the Unit E Plume for two reasons: (1) the Unit E Plume is migrating under the City and accordingly has affected the City more than the other plumes; and (2) the Unit E Plume was not known at the time the 2000 Order was entered.

Nevertheless, many of the City's comments are directly applicable and relevant to furthering the remediation of other plumes. Because both the MDEQ and PLS proposals include timeframes that extend out 20 years, the Court should recognize this timeframe. Similarly the Court should consider employing an expert scientific Master to provide to the court an independent evaluation of scientific data and opinions on all of the technical issues that are confronted in this matter (including, for example, such matters as the progress of the remediation, the need for and evaluation of additional site investigation, modeling, and data).

**I. Ann Arbor’s Proposed Modifications to the 2000 Order to address the Unit E Plume**

For the reasons stated in Section II of this memorandum, Ann Arbor believes that PLS should be ordered to implement the following three principal actions: (1) immediately stop any further migration of 1,4-dioxane in the E Unit from its Wagner Road property; (2) prevent further migration of the Unit E Plume beyond Maple Road; and (3) based on evaluation of the effects of 1 and 2, above, along with development of further information concerning the Plume and appropriate computer modeling, determine the best approach to resolution of issues for the Leading Edge. To achieve those goals, the Court should Order PLS, under the direction of MDEQ, to perform the following tasks and accomplish the following goals within the timeframes and completion dates stated. The time deadlines suggested by the City are reasonable and attainable. These tasks should be completed on parallel paths as shown on the gantt chart attached as Exhibit 1. The Court should conduct quarterly status conferences to assure these tasks are accomplished and to include additional requirements if needed. Because the City and its citizens are directly affected by this Plume, the City should be a participant in those conferences

**CONCURRENT REQUIRED ACTIONS**

**TIMELINE  
COMPLETION DATE**

**A. TASK ONE: BLOCK PLUME AT WAGNER ROAD - PLS to Block all further migration of 1,4-dioxane in Unit E from the PLS site**

- |                                                   |                    |
|---------------------------------------------------|--------------------|
| a. Install extraction wells at Wagner Road        | 11/04 – 01/05      |
| b. Connect wells to PLS existing treatment system | 04/05              |
| c. Commence pump/treat groundwater from wells     | 05/05              |
| d. Operate until 1,4-dioxane is less than MCL     | 05/05 - completion |

- B. TASK TWO: BLOCK PLUME AT MAPLE ROAD - PLS to Block full width of Unit E to prevent migration of 1,4 dioxane beyond Maple Road**
- a. Extraction Wells near Maple Village to block full Plume width
    - (1) Determine locations needed to block Plume 11/04 – 01/05
    - (2) Design and install extraction wells 11/04 – 04/05
    - (3) Connect to Treatment system at Maple Village 04/05 – 05/05
    - (4) Operate until 1,4-dioxane is less than MCL 06/05 - completion
  - b. Install/Operate Treatment Facility near Maple Village
    - (1) Design treatment system 11/04 – 02/05
    - (2) Acquire location and install 11/01 – 03/05
    - (3) Test and prove system 04/05 – 07/05
    - (4) Connect to Pipeline 06/05 – 08/05
    - (5) Commence full operation 08/05
    - (6) Operate until 1,4-dioxane less than MCL 08/05 – completion
  - c. Install/Operate Discharge Pipeline to discharge downstream of Barton Pond
    - (1) Design pipeline 11/04 – 02/05
    - (2) Obtain permits for discharge pipeline 11/04 – 02/05
    - (3) Complete Pipeline Construction 02/05 – 06/05
    - (4) Connect to treatment system and operate 06/05 – 08/05
    - (5) Operate until 1,4-dioxane less than MCL 08/05 - completion
  - d. Evaluate options such as groundwater re-injection and in situ treatment, but without reducing or avoiding efforts outlined above, including pipelines to Huron River. 11/04 - completion
- C. TASK THREE: PURGE WELLS UPGRADIENT OF MAPLE ROAD – PLS to extract and treat contamination between Wagner and Maple Village**
- a. Determine extraction locations to improve capture 11/04 – 02/05
  - b. Design extraction wells 11/04 – 01/05
  - c. Install extraction wells 02/05 – 04/05
  - d. Test wells to assure placement is proper 04/05 – 06/05
  - e. Connect wells to Maple Village treatment system 07/05
  - f. Operate until 1,4-dioxane less than MCL 08/05 – completion
- D. TASK FOUR: EVALUATE EFFECTIVENESS AND DETERMINE ADDITIONAL ACTIONS - PLS to study blocking Well effectiveness and downgradient Plume characteristics with downgradient monitoring wells, geologic investigations and computer modeling for later determination of Leading Edge remedial actions**

- |                                                   |                    |
|---------------------------------------------------|--------------------|
| a. Install downgradient monitoring wells          | 11/04 – 02/05      |
| b. Collect data from monitoring wells             | 11/04 – completion |
| c. Develop and optimize computer model            | 11/04 – 08/05      |
| d. Evaluate geologic issues                       | 11/04 – 08/05      |
| e. Prepare alternatives analysis for Leading Edge | 08/05 - 12/05      |
| f. Determination of final Leading Edge Remedy     | 01/06              |
| g. Implement final Leading Edge Remedy            | To Be Determined   |
- E. **TASK FIVE:** PLS must pay MDEQ Oversight Costs and Response Activity Costs: (i) incurred by the state with respect to the Unit E Plume, including any such costs incurred to date and any incurred in the future; (ii) incurred by the state with respect to the Core Area, the Western Plume, the Southwest Property area and the Evergreen Plume from this day forward, because PLS has not accomplished the cleanup requirements for those matters stated in the 2000 Order.
- F. **TASK SIX:** PLS must pay all Response Activity Costs (including reasonable consulting and attorney fees) incurred by the Local Governments with respect to the Unit E Plume, including any such costs incurred to date and any incurred in the future.
- G. **TASK SEVEN:** PLS must pay a court-appointed Master to aid the Court in evaluating scientific issues; and must pay others necessary to aid the master and the court. 11/04 – completion

**II. RATIONALE FOR SUGGESTED REVISIONS TO 2000 ORDER WITH RESPECT TO UNIT E PLUME**

**A. HISTORY OF THE UNIT E CONTAMINATION**

The 1,4-dioxane contamination at issue stems from disposal activities conducted by PLS from approximately 1968 through 1986. The contamination at the Core Area, the Western Plume, the Southwest Property area and the Evergreen Plume have been known for nearly 20 years. However, the contamination in the deeper, Unit E Plume has only been known for a short time. The first contamination exceeding cleanup criteria found east of PLS’s property on Wagner Road in the Unit E Plume was in a test well called, MW-71, which is located on Park Lane, just east of Wagner Road. MW-71 was installed on October 1, 2001. The resulting test data showed that it contained 370 parts per billion (“ppb”) of 1,4-dioxane. The next eastward

Unit E monitoring well was MW-72, which was installed on December 1, 2001 at the Michigan Inn (located near the intersection of Jackson Road and I-94). The first sample from MW-72 was found to contain 1,670 ppb of 1,4-dioxane. These wells were the first indication that any contamination in the E Unit was moving toward the heart of Ann Arbor.

Following installation of those wells, PLS installed a series of additional monitoring wells to the east. As shown in the schematic attached as Exhibit 2, PLS installed MW-79 in Veteran's Memorial Park, on July 25, 2002 (which identified a concentration of 915 ppb of 1,4-dioxane) following which a number of other wells were placed in Veteran's Memorial Park, at Maple Village Shopping Center, at Knights Inn and other locations to help define the extent of the Unit E Plume.

At this point, a number of wells showing non-detectable, or very low concentrations of, 1,4-dioxane seem to have defined the leading eastern edge of the Plume. For example, neither MW-91 (located at 2119 Arlene) nor MW-86 (located at 122 Warden) have been found to contain measurable concentrations of 1,4-dioxane. Similarly, there are wells directly south of Veterans Memorial Park which seem to define a southern boundary of the Plume in that immediate area. This is apparent from the test results for MW-89 (located at a Midas shop located just south of the park at the corner of Jackson and Maple) with 2 ppb and MW-90 (located at a church located a bit farther east on Jackson) with 8 ppb of 1,4-dioxane. However, MW-92, which was recently installed much farther north on Maple Road indicates the presence of 15 ppb of 1,4-dioxane. The cause of this is unknown and should be investigated.

While the configuration of the Plume is not well defined, the contamination continues to migrate through it relatively quickly. For example, the concentration of 1,4-dioxane found in monitoring wells installed in Veterans Memorial Park each have increased significantly over the short, two-year period they have been in existence. The same is true for the wells located at



Knights Inn and Michigan Inn. Consequently, it is important to require PLS to take steps as quickly as possible to stop the forward migration of the very heavily contaminated portions of the Plume, so that currently clean aquifers underlying the majority of the City of Ann Arbor will not be adversely affected.

If the migration is allowed to continue unchecked, the leading edge of contamination will continue to move into more densely populated areas within the City of Ann Arbor. As a result, the appropriate approach to remedial efforts must take into account not only the standard questions of technical feasibility, but also must consider the potential downside risks that may be faced by remedial activities conducted in residential areas. Based on current knowledge, the cleanup of the Unit E Plume will take decades to complete. However, if the migration of the heavily contaminated portions of the Plume is arrested now, downgradient areas can remain fit for use and may be protected, thereby reducing or eliminating the need for remedial activities in residential neighborhoods.

**B. THE BASES FOR SUGGESTED REVISIONS TO THE 2000 ORDER.**

As an initial matter, each of the tasks listed above and discussed below is: 1) defined by a clear objective; and 2) based on proven technology that has been utilized successfully at many groundwater cleanup sites in Michigan and elsewhere. Accordingly, the approaches are well known. As outlined in the timelines suggested above, the tasks should be conducted on a set of parallel paths. This will assure efficient accomplishment of the cleanup the entire process. Moreover, to the extent that PLS may wish to investigate theoretically promising, but unproven technology, it should do so without interrupting the schedules set out above.

1. **TASK ONE: BLOCK UNIT E PLUME AT WAGNER ROAD.** Prevent any further migration of Unit E contamination from the PLS facility on Wagner Road (through purge wells, treatment at the PLS facility and appropriate disposal of effluent). To be accomplished immediately.

The soil and groundwater at PLS's Core Area at Wagner Road still contain high concentrations of 1,4-dioxane, which continue to feed into the Unit E Plume and then migrate eastward toward Ann Arbor. The Core area also continues to feed into other aquifers that are moving in a westerly direction. As long as that source area is allowed to feed into the underlying aquifers, cleanup of the Unit E aquifer will not be accomplished. In contrast, if this continuing source is cut off, the aquifer clean up will become effective. Accordingly, the first and most important step in the overall Unit E cleanup is to stop any further offsite migration of 1,4-dioxane in the Unit E Plume from the PLS site at Wagner Road. Simply put, PLS should be ordered to focus on the Core Area first. Arresting the Plume and cleaning up the groundwater to the degree required to protect drinking water sources is critical. Downgradient areas will clean up more quickly, including those associated with Ann Arbor's Northwest Supply Well. In addition, this could protect the City's other groundwater supply wells located near the Airport.

This should be implemented through a set of blocking/extraction wells that capture the full width of the Plume. The Core Area is particularly well suited to accomplish this because (i) there would be no access problems for well installation; (ii) PLS has an existing treatment system on site to which the groundwater can be directed; and (iii) an existing discharge permit is in place for effluent disposal. The effluent may be redirected later for discharge through the pipeline that would start at Maple Road.

2. **TASK TWO: BLOCK UNIT E PLUME AT MAPLE ROAD.** Prevent any further migration of the most highly contaminated groundwater past Maple Road (by blocking and capturing the full width of the Unit E Plume with a set of purge wells located in the vicinity of Maple Road, appropriate treatment in the vicinity of Maple Village Shopping Center, followed by discharge of effluent through a pipeline to the Huron River, down stream of Barton Pond).

Certain areas of the Unit E Plume have been well defined and are understood. In particular, that includes information concerning the width and depth of the Plume at Wagner Road and at Maple Road. However, at Maple Road there appears to be a geologic change that is not fully understood at this time.<sup>2</sup> In particular, in the Maple Village Shopping Center area the concentrations of 1,4-dioxane are higher and the water pressure in the Unit E groundwater is much higher, than is true within Veterans Memorial Park (which is immediately across the street). This is strong evidence that the geology is considerably more complex than could have been anticipated.

Accordingly, it is technically sensible to block and capture this highly contaminated Unit E groundwater before it crosses Maple Road. By doing so, the ultimate cleanup will be expedited. Moreover, in this little-used commercial space there is room for installation of a treatment system that will not adversely affect residential neighborhoods. This location is immediately adjacent to a major set of roadways (I-94 to M-14) that could be used to install a discharge pipeline to the Huron River without disrupting the City or its residents. It is imperative that the pipeline discharge downstream of the City's water intake at Barton Pond, to prevent any adverse consequences if PLS's treatment system ever fails to operate properly. This pipeline should be engineered to handle all treated water (including from the Core Area) to ensure that the threat to the City water intake is eliminated. The City will aid in offering appropriate use of city rights of way to help accomplish this task.

3. **TASK THREE: PURGE WELLS UPGRADIENT OF MAPLE ROAD.** To accomplish the cleanup more expeditiously, additional purge wells may be installed upgradient of those identified in TASK TWO. This could occur for example near the Michigan Inn to accelerate the capture and treatment of the Plume even before it reaches Maple Village:

It may take decades for the groundwater in the Unit E Plume to travel from Wagner Road to the area of Maple Road where the TASK TWO Blocking/Extraction Wells will be installed. That extends the time it will take to accomplish an ultimate cleanup. The cleanup time may be reduced by decades if a further set of purge wells is installed at an appropriate location between Wagner Road and Maple Road. This would be close to the new treatment system in the Maple Village area and thus water could be piped to that treatment system and then discharged through the pipeline to the river. The location of these purge wells should be selected using appropriate groundwater data and computer modeling, and should avoid residential neighborhoods.

4. **TASK FOUR: EVALUATE SYSTEM EFFECTIVENESS AND DETERMINE ADDITIONAL ACTIONS.**

Even though the PLS contamination has been known for 20 years, the full extent of the Unit E Plume has not been determined. As a result, it is premature to decide what specific actions should be taken for the contamination in the Unit E Plume that has moved past Maple Road. Moreover, there is no comprehensive model to evaluate how the remediation of the Unit E Plume will affect the Core Area and other areas.

The geology and boundaries of the Unit E Plume are not yet understood in the areas east of Maple Road. As noted earlier, there is a distinct change in the geology and in the concentrations of 1,4-dioxane when the Plume crosses Maple Road to Veterans Memorial Park. Moreover, there is another marked change immediately east of the Park. Several wells lying

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<sup>2</sup> Professor Larry Lemke, an employee of TOSC, has stated that the geology East of Maple Road is much more complicated than the geology west of Maple Road.

immediately east of the Park have not yet found any detectable concentrations of 1,4-dioxane, even though they are in the immediate path that PLS has stated the Plume will follow as it travels toward the Huron River (MW-86 and MW-91). Meanwhile, MW-76 (lying southeast of the Park) does contain concentrations exceeding 85 ppb and MW-92 (on Maple Road, north of the Park) contains 15 ppb. This suggests that PLS's belief concerning the direction of the Unit E Plume is incorrect. Instead, it appears that another geologic change occurs immediately east of the Park, leading to a shift in the direction of the Plume. As a consequence of this uncertainty, more information is needed before final decisions are made about how to address these areas of the Plume. Accordingly, additional monitoring wells should be installed and computer modeling completed to allow a proper decision.

The City recognizes the frustration surrounding the need for additional information and data collection. However, basing a decision on poor science will lead to ineffective results and wasted resources, and greater frustration.

Ann Arbor believes that the Institutional Control suggested by PLS should be considered only if necessary and only after the Plume has been effectively blocked and cleansed to below drinking water requirements at Wagner Road and at Maple Road. Institutional Controls are a last resort that should be utilized only when all else fails. First, the effect of stopping the migration of the plume at Wagner and Maple Roads, the initial three TASKS outlined above, need to be demonstrated and evaluated to determine what, if any, further action is required at the Leading Edge. Second, as noted above, the geology and movement of the Unit E Plume is not well known after it passes Maple Road. As a result, it is not yet possible to determine what alternative technical approach would be best to address the Leading Edge of the Unit E Plume. Finally, the current projection of the future path of the Unit E Plume offered by PLS does not appear to be

correct.<sup>3</sup> As shown on the attached Exhibit 3, there are multiple domestic and other groundwater wells that may be downgradient of the current location of the Plume. For example, there are large numbers of private residential wells present in pockets of Ann Arbor Township that are located within the city limits of Ann Arbor. Accordingly, those wells must be protected if they are at risk. More information is needed to determine if those wells will be affected.

At this time, it would be premature to determine if Institutional Controls, such as an ordinance precluding use of groundwater wells, would be necessary or appropriate. PLS seems to believe that if an Institutional Control is put in place, it need not perform any further cleanup and can simply allow the contamination to migrate throughout the currently clean aquifer underlying the City and then discharge to the Huron River. MDEQ seems ready to approve PLS's proposal that no clean up would be required for anything below 2,800 ppb. In fact, if 2,800 ppb is the target, no cleanup will be necessary in any part of the Unit E Plume, because PLS asserts that it all will be below that concentration by the time it reaches the Huron River. Such a result is unacceptable. PLS should be required to clean up as much of this Plume as possible, not allow it to contaminate currently clean aquifers.

The approaches to remedial action should be staged in a way that takes best advantage of the known information and at the same time does not overreact in areas where the geologic and plume migration information are unknown (in order to avoid exacerbation of unknown circumstances). Once the above-mentioned blocking extraction wells and treatment systems are in operation, down gradient monitoring well testing should be conducted to determine the effect of the system on the areas between Maple Road and the Leading Edge. For example, this may lead to additional extraction from wells placed in Veterans Memorial Park (which water could be

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<sup>3</sup> MDEQ's modeling expert has deemed the PLS model a gross approximation at best.

piped to the new treatment system). It also would help to determine what if any steps need to be taken to address contamination that already has moved past Veterans Memorial Park to the Leading Edge.

With respect to this final work element, the City suggests that a small set of monitoring wells should be installed, on City property or rights of way, and appropriate computer modeling should be designed and implemented. The results should be studied using the computer models to determine if additional purge and treatment is necessary and if so, how the effectiveness of such activities might be undertaken without disruption of residential neighborhood.

#### **5. TASK 5: PLS TO PAY MDEQ'S COSTS.**

PLS should be required to pay the full Oversight Costs and Response Activity Costs incurred by the State of Michigan for all matters associated with the Unit E aquifer from the first identification of contamination in that newly discovered aquifer, as well as those incurred in the future until all remedial efforts are completed. In addition, PLS should be required to pay the costs incurred by the State of Michigan for all other response activities relating to other portions of PLS's contamination that have been incurred since the 2000 Order was entered, and into the future until all remediation is completed. This is justified because Part 201 of the Natural Resources and Environmental Protection Act, MCL 324.20101, et seq. requires that such costs be paid by the liable party. Moreover, at the time the 2000 Order was entered (and before that, when the original Consent Decree was entered), no one knew that the Unit E Plume existed. Consequently, no one could anticipate the extraordinary costs that MDEQ would be forced to incur in the ongoing issues associated with this enormous new plume.

In addition, because PLS has not successfully remediated the other plumes of contamination that were known to exist at the time the 2000 Order was entered (the core area, the Evergreen Plume and the Western Plume), the continued response activity costs and oversight costs incurred by MDEQ are matters that were beyond the contemplation of the parties and the Court when that order was entered. As a result, the Court should further alter its order and require that henceforward PLS be required to pay all future response activity costs and oversight costs associated with investigations and remedial and response activities conducted with respect to the Core Area, the Western Plume, the Evergreen Plume and any other additional areas of contamination associated with this matter that are discovered in the future.

**6. TASK SIX: PLS TO PAY LOCAL GOVERNMENT COSTS.**

For the same reasons noted in item 5, above, PLS should be ordered to pay the response activity costs incurred by local units of government. The City of Ann Arbor has incurred substantial response activity costs associated with investigations conducted with respect to the Unit E Plume. These costs have included such items as: evaluation and issuance of groundwater well permits requested by PLS; review and evaluation of data relating to the ongoing migration of the Unit E Plume into the City; time and expenses incurred to prepare for, attend and conduct public hearings, public meetings and meetings with PLS to discuss, understand and determine the appropriate courses of action to take with respect to the Unit E Plume and its future migration; investigations relating to determination of appropriate, temporary alternative water sources to use in place of the Northwest Supply Well (to assure that its resumption of operation will not exacerbate existing contamination); fees of consultants and attorneys; and the like. Accordingly, the Court should order that PLS reimburse to the City all past response activity costs that it has incurred, and further order that PLS pay to the City of Ann Arbor all future response activity costs that it will incur until the matter is concluded.



**7. TASK SEVEN: PLS TO PAY COURT-APPOINTED TECHNICAL MASTER.**

Ann Arbor believes that the Court would benefit from having a Special Master who is versed in the movement of contamination and in remediation techniques. This person could serve to advise the Court on matters that are highly technical in nature, thus assuring that proposals made by the parties are sensible, reasonable and can be accomplished. This would be particularly helpful to the Court when the parties have presented technical positions that are diametrically opposed to one another. In addition to appointing a Special Master, the City believes that the Master should be allowed to engage outside experts to further aid the Court's inquiries. PLS should be required to pay all necessary fees and expenses for the Special Master and any other experts that may be needed to aid the Court..

Respectfully submitted,

BODMAN LLP

BY: \_\_\_\_\_  
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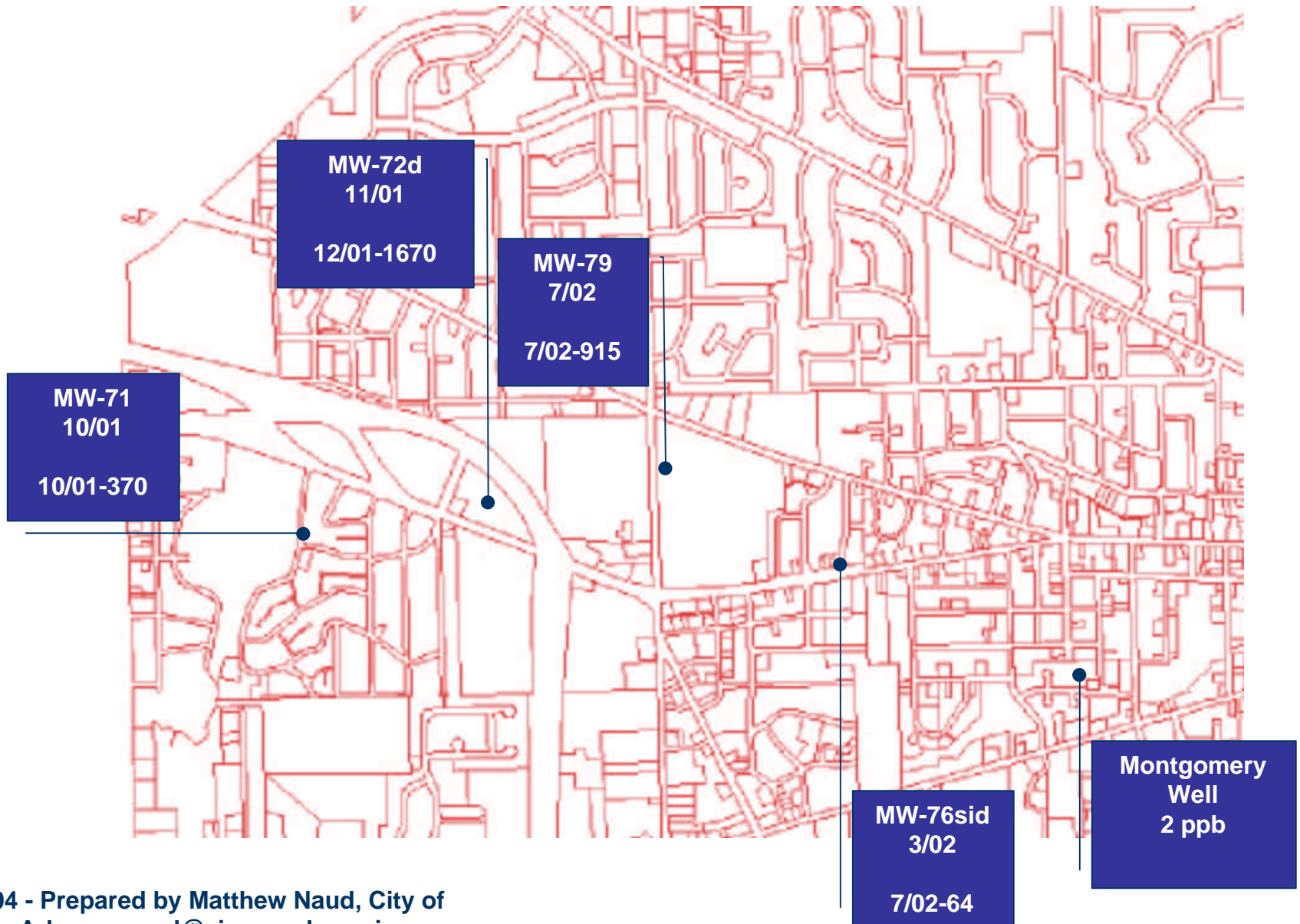
DATED: October 8, 2004.

| ID | Task Name                                                                           | Duration         | Start              | Finish             | 2005 |     |     |     |     |     |     |     |     |     |     |     | 2006 |     |     |     |  |
|----|-------------------------------------------------------------------------------------|------------------|--------------------|--------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|--|
|    |                                                                                     |                  |                    |                    | Oct  | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct  | Nov | Dec | Jan |  |
| 1  | <b>Stop Plume at Wagner Road</b>                                                    | <b>348 days?</b> | <b>Mon 11/1/04</b> | <b>Tue 2/28/06</b> |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 2  | Install extraction wells at Wagner Road                                             | 45 days?         | Mon 11/1/04        | Sat 1/1/05         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 3  | Connect wells to PLS treatment system                                               | 21 days?         | Fri 4/1/05         | Sat 4/30/05        |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 4  | Commence pump/treat groundwater from wells                                          | 1 day?           | Sun 5/1/05         | Sun 5/1/05         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 5  | Operate until 1,4-dioxane is less than MCL                                          | 217 days?        | Mon 5/2/05         | Tue 2/28/06        |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 6  | <b>Stop Plume at Maple Village</b>                                                  | <b>306 days?</b> | <b>Mon 11/1/04</b> | <b>Sun 1/1/06</b>  |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 7  | <b>Extraction Wells near Maple Village to block full Plume width</b>                | <b>306 days?</b> | <b>Mon 11/1/04</b> | <b>Sun 1/1/06</b>  |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 8  | Determine locations needed to block Plume                                           | 45 days?         | Mon 11/1/04        | Sat 1/1/05         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 9  | Design and install extraction wells                                                 | 110 days?        | Mon 11/1/04        | Fri 4/1/05         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 10 | Connect to Treatment system at Maple Village                                        | 21 days?         | Mon 4/4/05         | Sun 5/1/05         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 11 | Operate until 1,4-dioxane is less than MCL                                          | 153 days?        | Wed 6/1/05         | Sun 1/1/06         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 12 | <b>Install/Operate Treatment Facility near Maple Village</b>                        | <b>310 days?</b> | <b>Mon 11/1/04</b> | <b>Thu 1/5/06</b>  |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 13 | Design treatment system                                                             | 67 days?         | Mon 11/1/04        | Tue 2/1/05         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 14 | Acquire location and install                                                        | 87 days?         | Mon 11/1/04        | Tue 3/1/05         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 15 | Test and prove system                                                               | 67 days?         | Fri 4/1/05         | Fri 7/1/05         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 16 | Connect to Pipeline                                                                 | 23 days?         | Mon 7/4/05         | Wed 8/3/05         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 17 | Commence full operation                                                             | 1 day?           | Thu 8/4/05         | Thu 8/4/05         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 18 | Operate until 1,4-dioxane less than MCL                                             | 110 days?        | Fri 8/5/05         | Thu 1/5/06         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 19 | <b>c. Install/Operate Discharge Pipeline to discharge downstream of Barton Pond</b> | <b>307 days?</b> | <b>Mon 11/1/04</b> | <b>Mon 1/2/06</b>  |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 20 | (1) Design pipeline                                                                 | 67 days?         | Mon 11/1/04        | Tue 2/1/05         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 21 | (2) Obtain permits for discharge pipeline                                           | 67 days?         | Mon 11/1/04        | Tue 2/1/05         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 22 | (3) Complete Pipeline Construction                                                  | 87 days?         | Wed 2/2/05         | Wed 6/1/05         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 23 | (4) Connect to treatment system and operate                                         | 43 days?         | Thu 6/2/05         | Mon 8/1/05         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 24 | (5) Operate until 1,4-dioxane less than MCL                                         | 110 days?        | Tue 8/2/05         | Mon 1/2/06         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 25 | d. Evaluate options such as groundwater re-injection and in situ treatment, but w   | 305 days?        | Tue 11/2/04        | Sat 12/31/05       |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 26 | <b>C. TASK THREE: PURGE WELLS UPGRADIENT OF MAPLE ROAD</b>                          | <b>307 days?</b> | <b>Mon 11/1/04</b> | <b>Mon 1/2/06</b>  |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 27 | Determine extraction locations to improve capture                                   | 67 days?         | Mon 11/1/04        | Tue 2/1/05         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 28 | Design extraction wells                                                             | 45 days?         | Mon 11/1/04        | Sat 1/1/05         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 29 | Install extraction wells                                                            | 44 days?         | Tue 2/1/05         | Fri 4/1/05         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 30 | Test wells to assure placement is proper                                            | 44 days?         | Mon 4/4/05         | Wed 6/1/05         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 31 | Connect wells to Maple Village treatment system                                     | 1 day?           | Fri 7/1/05         | Fri 7/1/05         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 32 | Operate until 1,4-dioxane less than MCL                                             | 111 days?        | Mon 8/1/05         | Mon 1/2/06         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 33 | <b>D. TASK FOUR: EVALUATE EFFECTIVENESS AND DETERMINE ADDITIONAL A</b>              | <b>415 days?</b> | <b>Mon 11/1/04</b> | <b>Thu 6/1/06</b>  |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 34 | Install downgradient monitoring wells                                               | 23 days?         | Mon 11/1/04        | Wed 12/1/04        |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 35 | Collect data from monitoring wells                                                  | 305 days?        | Tue 11/2/04        | Sat 12/31/05       |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 36 | Develop and optimize computer model                                                 | 196 days?        | Tue 11/2/04        | Mon 8/1/05         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 37 | Evaluate Geologic issues                                                            | 196 days?        | Tue 11/2/04        | Mon 8/1/05         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 38 | Prepare alternatives analysis for Leading Edge                                      | 89 days?         | Mon 8/1/05         | Thu 12/1/05        |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 39 | Determination of final Leading Edge Remedy                                          | 1 day?           | Mon 1/2/06         | Mon 1/2/06         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 40 | Implement final Leading Edge Remedy                                                 | 1 day?           | Thu 6/1/06         | Thu 6/1/06         |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 41 | E. TASK FIVE: PLS must pay MDEQ Oversight Costs and Response Activity Co            | 1 day?           | Wed 12/1/04        | Wed 12/1/04        |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 42 | F. TASK SIX: PLS must pay all Response Activity Costs incurred by the Local Govern  | 1 day?           | Wed 12/1/04        | Wed 12/1/04        |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |
| 43 | G. TASK SEVEN: PLS must pay a court-appointed Master to aid the Court in ev         | 1 day?           | Wed 12/1/04        | Wed 12/1/04        |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |  |

Project: pall  
Date: Thu 10/7/04

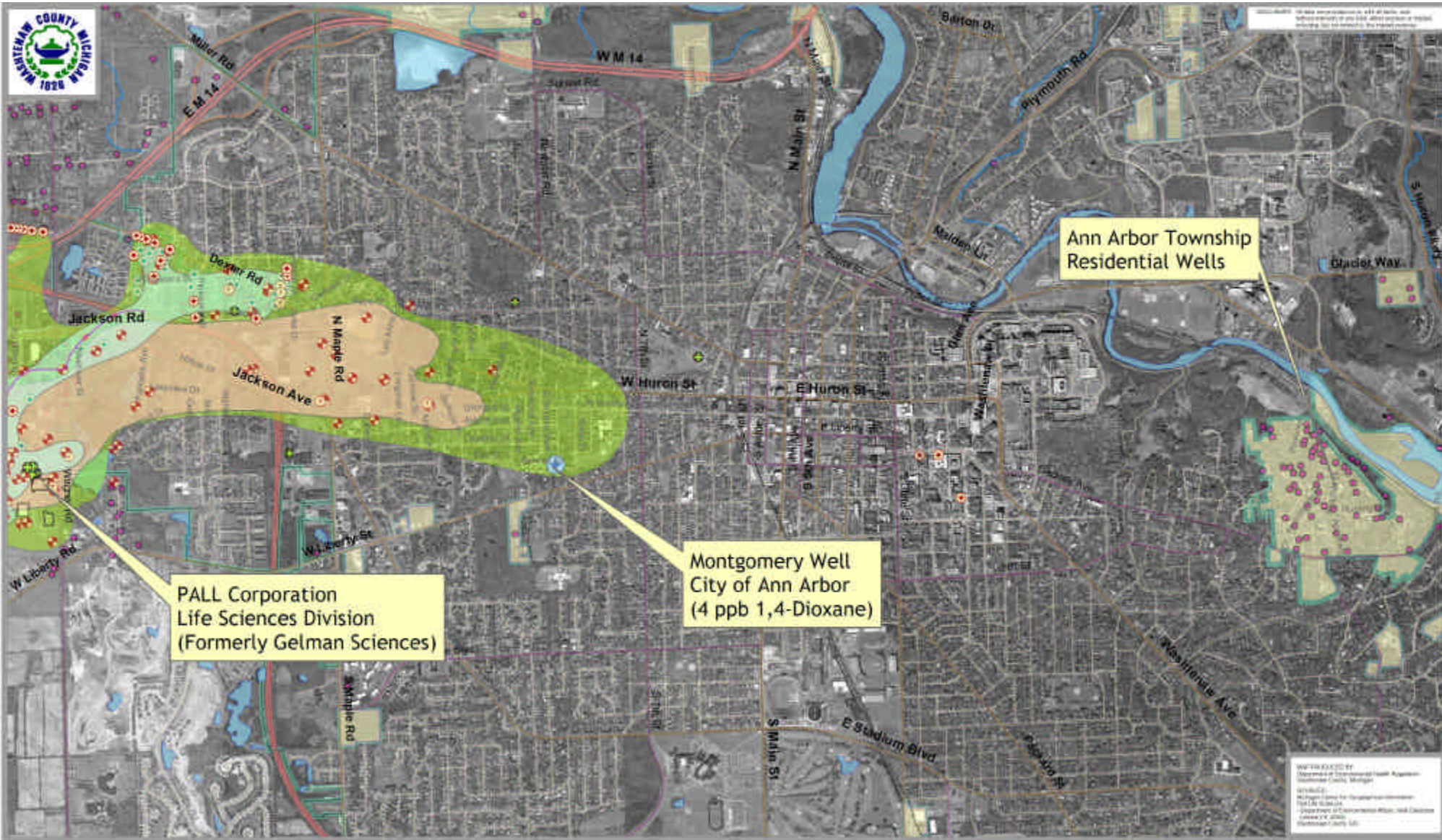
Task Progress Summary External Tasks Deadline

Split Milestone Project Summary External Milestone





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PALL Corporation  
Life Sciences Division  
(Formerly Gelman Sciences)

Montgomery Well  
City of Ann Arbor  
(4 ppb 1,4-Dioxane)

Ann Arbor Township  
Residential Wells

WASHTENAW COUNTY MI  
Department of Environmental Health Agency  
Health and Safety Division  
1000 State St  
Ann Arbor, MI 48106  
Phone: 734.769.3333  
Fax: 734.769.3334  
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