

STATE OF MICHIGAN  
IN THE WASHTNAW COUNTY CIRCUIT COURT

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STATE OF MICHIGAN, *ex rel.* MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
AND ENVIRONMENT,

Case No. 88-34734-CE  
Hon. Timothy P. Connors

Plaintiff,

and

CITY OF ANN ARBOR, WASHTENAW COUNTY,  
WASHTENAW COUNTY HEALTH  
DEPARTMENT, WASHTENAW COUNTY  
HEALTH OFFICER ELLEN RABINOWITZ, in her  
official capacity, the HURON RIVER WATERSHED  
COUNCIL, and SCIO TOWNSHIP,

Intervening Plaintiffs,

**INTERVENING PLAINTIFFS’  
JOINT BRIEF IN SUPPORT OF  
AN ADDITIONAL RESPONSE  
ACTIVITIES ORDER (“2021  
ORDER”) TO IMPLEMENT  
REVISED CLEANUP CRITERIA  
AND TO MODIFY EXISTING  
RESPONSE ACTIVITY ORDERS  
AND JUDGMENTS**

-v-

GELMAN SCIENCES, INC., d/b/a PALL LIFE  
SCIENCES, a Michigan Corporation,

Defendant.

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**INTERVENING PLAINTIFFS' JOINT BRIEF IN SUPPORT OF AN ADDITIONAL  
RESPONSE ACTIVITIES ORDER ("2021 ORDER") TO IMPLEMENT REVISED CLEANUP  
CRITERIA AND TO MODIFY EXISTING RESPONSE ACTIVITY ORDERS AND  
JUDGMENTS**

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## I. INTRODUCTION

The Intervenors<sup>1</sup> jointly request<sup>2</sup> entry of a new Gelman Response Activities Order (“2021 Order”) which would implement revised cleanup criteria set by the State of Michigan and which would modify and largely replace the existing orders and judgments in the case that govern response activities, actions, obligations and duties related to 1,4-dioxane that continues to spread from defendant’s (“Gelman”) facility located on Wagner Road in Scio Township. The existing orders and judgments are referred to herein, collectively, as the “Current Court Orders.”<sup>3</sup> Except as specifically modified by the proposed 2021 Order, the Current Court Orders should remain in full force and effect -- but if there if there is any ambiguity or if there are any conflicts of requirements, the 2021 Order should prevail. As requested, this brief: (i) identifies additions and changes the Intervenors seek; (ii) presents the legal and scientific/technical justification for those changes; and (iii) proposes specific terms to be placed in the 2021 Order.

One of the principal driving forces for replacement of the Current Court Orders was the state’s 2016 adoption of new cleanup criteria for 1,4-dioxane, which reduced allowable concentrations by more than an order of magnitude (e.g., from 85 ppb<sup>4</sup> to 7.2 ppb for

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<sup>1</sup> The intervening plaintiffs are the City of Ann Arbor, Washtenaw County, the Washtenaw County Health Department, the Washtenaw County Health Officer, Scio Township, and the Huron River Watershed Council (collectively, “Intervenors”).

<sup>2</sup> The City of Ann Arbor does not join in or assert any claims against Gelman in this action that it released in the 2006 “Release of Claims and Settlement Agreement” entered between the City and Gelman. The City asserts in this action only claims reserved to the City in that 2006 settlement.

<sup>3</sup> There is no single, official comprehensive document in the case file that constitutes the Current Court Orders. There have been a series of evidentiary hearings, motions, briefs and arguments, and accordingly as used herein the term “Current Court Orders” means the numerous resulting findings, determinations, orders, judgments and consent judgments that are currently in effect, as modified, which govern response activities related to the Gelman 1,4-dioxane contamination and plumes. For ease of reference purposes the Intervenors have compiled a document which shows changes to the judgments through the Third Amendment to the CJ -- attached as **Ex. A**.

<sup>4</sup> Concentrations expressed as ug/L (micrograms per liter) are equivalent to ppb (parts per billion) in dilute aqueous solutions. Therefore, those terms are used interchangeably.

groundwater to be used for residential drinking water; and from 2,800 ppb to 280 ppb for groundwater venting to surface water – at the groundwater to surface water interface “GSI”). This resulted from findings by the State of Michigan that the cleanup criteria for 1,4-dioxane then in effect were **not** protective of public health.

Based on these revised cleanup criteria, the state, Gelman and the Intervenors negotiated to modify and supplement the Current Court Orders. When no more could be achieved through negotiation, the then-proposed document, which was entitled the “Fourth Amended and Restated Consent Judgment” (referred to herein as the “Proposed 4<sup>th</sup> CJ”) was publicly considered and voted upon, but was rejected as insufficient by the Intervenors’ governing bodies. The Key Differences between the Current Court Orders and the Proposed 4<sup>th</sup> CJ are set out in the following Chart:

**Chart of Key Differences Between Current Court Orders and Proposed 4<sup>th</sup> CJ**

<b>Issue</b>	<b>4<sup>th</sup> CJ Text Location</b>
<b>New, lower cleanup criterion (85 ppb to 7.2 ppb) incorporated</b> in definition of 1,4-dioxane Groundwater Contamination	III.K (Definitions), p.4
<b>Prohibition Zone (PZ) expanded</b> to cover additional area to account for the reduction in the drinking water cleanup criterion	III.Q (Definitions) and Attachment C (map of new PZ), p.5
<b>Definition of 1,4-dioxane Soil Contamination</b> changed to reflect new, lower cleanup standard (1700 ppb to 500 ppb)	III.W (Definitions), p.6
<b>Removed Maple Road Containment Objective</b> to prevent concentrations of 1,4-dioxane above 2800 ppb (the old GSI criterion) from migrating east of Maple Road, while adding that Gelman must prevent venting of 1,4-dioxane to surface waters in Eastern Area above the new, lower GSI criterion (280 ppb) except in compliance with state law	V.A.1.b (Eastern Area Objectives), p.8
<b>PZ boundary may not be expanded unless</b> clear and convincing evidence that there are compelling reasons expansion is necessary to prevent an unacceptable risk to human health	V.A.2.f (Eastern Area Objectives), p.10



Issue	4 <sup>th</sup> CJ Text Location
<p><b>Requires installation of additional monitoring wells</b> on northern PZ boundary (called Sentinel Wells) and elsewhere on PZ boundary (PZ Boundary Wells) in order to detect and prevent potential breaches of the PZ boundary before they occur; establishes trigger levels which impose additional obligations on Gelman if exceeded (e.g., increased sampling, installation of additional monitoring wells, and provision of municipal water to potentially impacted wells)</p>	<p>V.A.3.a-d (Eastern Area Objectives), pp. 12-13; V.A.4-5 (Eastern Area Objectives), pp.17-22</p>
<p><b>Requires installation of new Rose and Parklake Wells</b> in order to more than double the rate of groundwater that is pumped and treated. Provides the possibility for treated water from the Parklake Well to be discharged to First Sister Lake</p>	<p>V.A.3.e-f (Eastern Area Objectives), pp. 13-16; V.A.8.g (Eastern Area Objectives), pp. 28-29</p>
<p><b>Requires installation of three additional monitoring wells/clusters</b> in order to further delineate the migration of 1,4-dioxane downgradient of Maple Road</p>	<p>V.A.5.f (Eastern Area Objectives), p. 22</p>
<p><b>Creates a PZ boundary review process</b> to occur every five years to determine whether the boundary of the PZ can be contracted</p>	<p>V.A.6 (Eastern Area Objectives), pp. 23-24</p>
<p><b>Requires Gelman to prevent venting</b> of 1,4-dioxane to surface waters in Western Area above the new, lower GSI criterion (280 ppb), except in compliance with state law</p>	<p>V.B.2 (Western Area Objectives), pp. 31-32</p>
<p><b>Requires installation of six additional monitoring wells/clusters</b> in order to further delineate the migration of 1,4-dioxane in the Western Area</p>	<p>V.B.3.b (Western Area Objectives), pp. 33-34</p>
<p><b>Removes the Little Lake Area System objective of non-expansion</b> of the horizontal extent of groundwater contamination; removed because this system would now be included within the Western Area for purposes of the Western Area Objectives</p>	<p>N/A</p>
<p><b>Creates more robust Western Area compliance well verification</b> process to ensure that Western Area objectives are met</p>	<p>V.B.4 (Western Area Objectives), pp.36-40</p>
<p><b>Removed the requirement to investigate former spray irrigation area</b> on Gelman property in order to ensure meeting objective of preventing 1,4-dioxane from venting to Third Sister Lake in excess of 2800 ppb; removed because this area is now included within the Western Area for purposes of the Western Area Objectives and the investigation has already occurred</p>	<p>N/A</p>

Issue	4 <sup>th</sup> CJ Text Location
<b>Requires installation of three additional extraction wells in Gelman Property source area</b> at a combined purge rate of ~75 gallons per minute (gpm), with the potential to install three additional extraction wells if required by EGLE	VI.C.1 (Gelman Property Response Activities), pp. 46-48
<b>Requires operation of a phytoremediation</b> system in the source area, which involves planting trees in order to remove 1,4-dioxane via biodegradation and transpiration and extract perched [i.e., not connected to an aquifer] groundwater	VI.C.2 (Gelman Property Response Activities), pp.48-49
<b>Requires operation of a heated soil vapor extraction system (HSVE)</b> in the source area in order to reduce the mass of 1,4-dioxane in the soil, and placement of two impervious barriers in order to inhibit water from percolating through the soils (these requirements replace the previous soils system objective and plan); HSVE technology involves heating the soil to cause 1,4-dioxane to better volatilize and then extracting the resulting vapors	VI.C.4 (Gelman Property Response Activities), pp. 49-51

The added requirements in the Proposed 4th CJ are all technically and scientifically necessary and appropriate response activities [See, Intervenor’s Expert Opinion Report (“Int Exp Rept”), p.5] that must be required of Gelman under Part 201 of the Michigan Natural Resources and Environmental Protection Act, MCL 324.20101, et seq. (Part 201), but they are technically and scientifically insufficient [Id.], and in some respects, unacceptable. In this brief, the Intervenor’s identify specific issues and concerns that go beyond the Proposed 4<sup>th</sup> CJ (including additional delineation, additional plume management, additional Prohibition Zone controls, and additional mass removal efforts) that need to be addressed, with revised and new terms, and provide the legal and scientific support for those additional terms. For convenience of reference, the following table summarizes the scientific and technical topics of concern, the proposed modifications or additions of requirements beyond the Proposed 4th CJ to address those issues, and the expert scientific justification/opinion supporting the requests. There are a few additional legal and process topics, related to the Intervenor’s ongoing involvement in the case, which are discussed at the end of the brief.

**Summary Table of Intervenor Concerns and Solutions for Inclusion in 2021 Order  
[Showing Proposed Modifications and Additions to Terms of Proposed 4th CJ]**

<b>Intervenor Concern</b>	<b>Proposed New Requirement for 2021 Order</b>	<b>What this would Achieve</b>	<b>Technical/Scientific Justification</b>	<b>Primary Expert</b>
Incomplete delineation of groundwater contamination	<b>1A.</b> Semiannual maps showing extent of 1,4-dioxane concentrations at 1, 7.2, and 280 ppb	Provide a basis for assessing efficacy of remedial actions and assessing risk of future impacts to drinking water wells	Up-to-date maps depicting the extent of 1,4-dioxane contamination are essential for assessing attainment of remedial objectives.	Lemke
Perimeter monitoring well gaps	<b>1B.</b> Two additional Sentinel wells along northern PZ boundary (AA, BB); and replacement well for MW-63 (CC)	Reduce spacing between monitoring wells in key areas of concern	1,4-dioxane is known to migrate along narrower pathways in this complex aquifer system; these wells will reduce the likelihood that such plumes are not detected	Lemke
Size of prohibition zone expansion	<b>1C.</b> More limited PZ expansion to the south	Appropriate buffer to account for uncertainty commensurate with reduction from 85 to 7.2 ppb	Expansion proportional to concentration gradient along southern edge of plume; expansion aligned with expected migration path	Lemke
Northward migration toward Barton Pond	<b>1D.</b> Three additional monitoring wells north of PZ boundary (DD, EE, FF)	Determine aquifer quality, hydraulic gradient, and presence/absence of 1,4-dioxane in this area	Reliable information is needed to assess the potential for northward migration and put community concerns to rest	Lemke
Discharge to Allen Creek at concentrations exceeding the GSI criterion	<b>2A.</b> Two high resolution transects (T <sub>1</sub> -T <sub>1</sub> ' and T <sub>2</sub> -T <sub>2</sub> ')	Identify zones of high 1,4-dioxane concentrations migrating at all depths above bedrock that will guide additional remedial actions	High resolution transects are commonly used to quantify mass flux and design remedial strategies	Lemke
	<b>2B.</b> Two additional downgradient investigation monitoring wells (GG, HH)	Delineation of 280 ppb extent in the downgradient Eastern Area	Determine if 1,4-dioxane is venting to Allen Creek from north or south; detect 1,4-dioxane migration further downgradient in artesian area	Lemke
	<b>2C.</b> Shallow groundwater profiling and monitoring along Allen Creek Drain	Delineate contamination at or above GSI on north and south flanks of Allen Creek Drain	Ensure "Groundwater-Surface Water Interface Objective" is met	Gadway / Lemke
500 ppb extraction well termination criterion is too high	<b>3A.</b> Terminate extraction after pumping no longer contributes to	Extend benefits of additional mass removal	Extraction well concentrations may not reflect maximum concentrations in the	Lemke

<b>Intervenor Concern</b>	<b>Proposed New Requirement for 2021 Order</b>	<b>What this would Achieve</b>	<b>Technical/Scientific Justification</b>	<b>Primary Expert</b>
	beneficial reduction in 1,4-dioxane mass		surrounding aquifer.	
Public opposition to Parklake Well discharge into First Sister Lake / NPDES permit risk	<b>3B.</b> Pipe treated water to the Gelman Property and discharge under existing NPDES permit	Avoids NPDES permit risk while providing flexibility, and avoids potential adverse environmental impacts.	200 GPM exchanges the volume of First Sister Lake approximately once each month, giving rise to potential adverse environmental impacts.	Lemke
Limited reach of Source Area extraction wells pumping at low rates in low conductivity zones	<b>3C.</b> Concurrent pump-and-treat from 6 or more purge well locations on the Gelman property	Accelerating pumping from the shallow aquifer underlying the Source Area maximizes mass removal in the shortest time frame	Given demonstrated aquifer heterogeneity, wells distributed throughout the Source Area make sense, and there is no compelling reason to wait.	Gadway
Performance monitoring criteria have not been specified for the phytoremediation systems – How will we know if they are working?	<b>3D.</b> Gelman to develop phytoremediation effectiveness verification plans including monitoring groundwater 1,4-dioxane concentrations, water table elevations, and 1,4-dioxane in plant tissue	Ensure that the phytoremediation systems are achieving groundwater table control and mass removal objectives	This is relatively new technology. Performance monitoring is needed to demonstrate effectiveness of phytoremediation systems and verify that the Western Area GSI Objective is attained.	Gadway
Potential enhancements can be incorporated into the HSVE system design	<b>3E.</b> Install permanent cap prior to HSVE operation and cycle HSVE system before termination.	More efficient HSVE system operation and avoidance of premature termination	The HSVE system will operate more effectively with a cap in place. System cycling if exhaust air concentrations become asymptotic will demonstrate HSVE has reached its effective limit.	Gadway
Documented presence of 1,4-dioxane in Allen Creek, Third Sister Lake, unnamed tributary to Honey Creek	<b>4A.</b> Annual sampling of surface water bodies and drainage systems	Detection will trigger investigation to determine risk of exceeding the GSI criterion	Changes indicating venting of groundwater with 1,4-dioxane at new locations or rising concentrations will not be detected without regular surface water body testing.	Lemke
Western Area Non-Expansion Cleanup Objective verification threshold is too high	<b>4B.</b> Reduce exceedance threshold from 7.2 to 3.5 ppb	Expansion of Western Area groundwater contamination will be detected before it has migrated to the compliance well location	An increase in concentrations to 7.2 ppb at a compliance well is evidence that expansion of the horizontal extent of contamination has already taken place.	Lemke

<b>Intervenor Concern</b>	<b>Proposed New Requirement for 2021 Order</b>	<b>What this would Achieve</b>	<b>Technical/Scientific Justification</b>	<b>Primary Expert</b>
Inconsistent requirements to initiate and subsequently scale back response activities based on threshold exceedances	<b>4C.</b> Adopt a consistent three-month-in-a-row requirement to initiate or cease responses at Sentinel, Boundary, and Compliance Wells	A three-in-a-row requirement to both initiate and interrupt remedial activities is more consistent and more protective	Statistical variation is just as likely to result in low concentration measurements as high concentration measurements.	Lemke
1,4-dioxane detections in residential drinking water wells	<b>4D.</b> Municipal Water Connection Contingency Plan (MWCCP) for Breezewood Ct; three-in-a-row requirement to stop bottled water supply	Proactive planning for Breezewood Ct residents (same as Elizabeth Rd); More consistent and protective bottled water requirements	1,4-dioxane has been detected in a residential well on Breezewood Ct (just like Elizabeth Rd). The same protections should be afforded there. Three-in-a-row is consistent with response activity threshold frequencies in 4C.	Lemke
	<b>4E.</b> Use of EPA Method 522 to analyze water from residential wells within 1,000 feet of the mapped limit of 1,4-dioxane contamination	Lower analytical method detection limits for residential water well samples near the plume will give a greater sense of confidence to homeowners	Use of EPA Method 522 for the analysis of drinking water from wells in close proximity to the plume is consistent with the requirements imposed on operators of public drinking water supplies.	Gadway
Gaps, inconsistencies, and delays accessing Gelman analytical data	<b>4F.</b> Provide universal access to the Gelman database via a cloud-based system for all monitoring well, extraction well, and NPDES treatment and discharge activity information; Release copies of source area environmental and engineering studies	A single database containing all relevant analytical information associated with monitoring, extraction, and permitted discharges will ensure that all parties are viewing and making decisions based on the same information	Accurate and timely access to site data are needed by all stakeholders including Gelman, EGLE, and the general public. Prior environmental and pilot engineering studies are essential for understanding the basis for selected source area remedies.	Lemke

## II. FACTUAL AND PROCEDURAL BACKGROUND

When devising a 2021 Order to supplement and modify the response activities required by the Current Court Orders, we are not writing on a clean slate. Not only is this case scientifically challenging, it also has a long, complex procedural and legal history. This lawsuit was initiated in 1988, more than 32 years ago. During the ensuing years, the statutes serving as the basis for the state's claims have been changed, new statutes were enacted, even the new statute (Part 201) has been amended several times, the cleanup criteria for 1,4-dioxane have been changed several times, there have been evidentiary hearings, findings of fact and conclusions of law determined by court action, there have been settlements of certain disputed matters by agreement of the parties, there have been bargained waivers of certain claims or rights by parties in order to achieve other objectives, and there have been determinations and rulings by the Court's opinions and orders when no agreement could be reached on certain issues. Sometimes judgments have been entered by consent of the parties and other times orders or judgments have been entered by the Court's own determinations, regarding matters which were strenuously disputed. All of the foregoing add up to what now constitutes the Current Court Orders in the case.

In creating the 2021 Order, one must recall that some provisions in the Current Court Orders are the product of bargaining, by which a party relinquished or waived certain claims/rights in order to achieve other important goals. What was achieved in those trades should not be extinguished as a 2021 Order is created. The appropriateness of the proposed terms of a 2021 Order should be viewed in light of the long history of the case.

The main components of the Current Court Orders and what led up to each (up through what is titled the “Third Amendment to Consent Judgment”) are summarized in the following sub-sections and are incorporated into the meaning of that term as used in this brief.

**A. The original action and resulting consent judgment and initial amendments (1988 – 1999).**

The State of Michigan brought this action in 1988 to address 1,4-dioxane that Gelman dumped or sprayed into the environment between 1966 and 1986, resulting in widespread contamination of the surrounding soil and groundwater. The contamination has continued to spread from the “Gelman Property” on Wagner Road, and multiple groundwater contaminant plumes now stretch more than four miles under Scio Township and the City of Ann Arbor. Int Exp Rept p. 5. 1,4-dioxane is completely soluble (or miscible) in water and is held together by strong molecular bonds that prevent it from breaking down readily in groundwater.

In 1992, the Court entered the original consent judgment which required Gelman to remove and treat all of the contaminated groundwater. In 1996, the Court entered the First Amendment to Consent Judgment, which revised the cleanup criteria in the consent judgment so that they were consistent with the cleanup criteria developed under Part 201 of Michigan’s Natural Resources and Environmental Protection Act (MCL 324.20101 et seq.) (“Part 201”), a statute that had recently been enacted to regulate contaminated sites in Michigan.<sup>5</sup> In 1999, the Court entered the Second Amendment to Consent Judgment, which provided for alternate disposal methods for certain purged groundwater.

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<sup>5</sup> Michigan’s Department of Environment, Great Lakes, and Energy (“EGLE”) establishes cleanup criteria under Part 201, which are the numerical criteria for hazardous substances that, in EGLE’s judgment, are required for response activities to be protective of public health, safety, welfare, and the environment. MCL 324.20120a; Mich Admin R 299.3.

**B. The REO – the Court enters a supplemental order to require additional response activities (2000).**

In 2000, the Court entered its Opinion and Remediation Enforcement Order (“REO”).

**Ex. B.** The REO resulted from EGLE’s motion to enforce the Consent Judgment and three days of evidentiary hearings. The Court ruled:

It is also clear, however, that that purging of 1,4-dioxane has not occurred fast enough to provide the public, or the Court, with assurance that the plume of 1,4-dioxane was contained as early as it should have been or that there is an ongoing approved plan that will lead to the removal of unlawful levels of this pollutant from the area’s water supplies.

\* \* \*

Based upon the evidence submitted, this Court is going to grant equitable relief in the sense that the Court will use its equitable powers to enforce the consent judgment to insure that 1,4-dioxane levels in these water supplies is brought within acceptable standards as soon as possible. Both sides in this dispute appear to need the intervention of the Court to keep them moving toward this goal.

*Id.*, pp. 2, 3.

The Court required Gelman to, among other things, (1) submit a detailed plan to reduce 1,4-dioxane in all affected water supplies below legally acceptable levels within a maximum period of five years; (2) install additional monitoring and extraction wells; (3) install an additional ultraviolet treatment unit; and (4) increase the pumping rate in existing extraction wells. *Id.*, pp. 4-5. The Court established tight timeframes for each requirement. For example, Gelman’s detailed plan was due within 45 days of the order. *Id.*, p. 4. Gelman did not appeal the REO. Instead, it prepared the Five Year Plan as directed in the REO and, on January 10, 2001, by stipulation of the parties, the Court approved the plan, which required Gelman to remediate 1,4-dioxane in the groundwater to concentrations below the cleanup criteria then in effect.



**C. The Unit E and Prohibition Zone Orders – the Court establishes the Prohibition Zone after Gelman discovers the plume had migrated in an unanticipated way (2001 – 2005).**

In 2001, Gelman discovered that 1,4-dioxane had migrated to a deeper aquifer which the parties called "Unit E." EGLE and Gelman disagreed over how to address the contamination and the parties presented the issue to the Court for decision. The fundamental disagreement between the parties was whether Gelman would be required to comply with the aquifer protection rules and, if not, what conditions Gelman would need to satisfy. The aquifer protection rules impose stringent requirements concerning contamination of groundwater in aquifers:

(5) The horizontal and vertical extent of hazardous substance concentrations in an aquifer above the higher of either the concentration allowed by section 20120a(1)(a) [i.e., the generic residential cleanup criteria] or (10) [i.e., the target detection limit or background concentration] of the act, as applicable, shall not increase after the initiation of remedial actions to address an aquifer, except as approved by the director as provided in section 20118(5) and (6) of the act.

(6) All remedial actions that address the remediation of an aquifer shall provide for removal of the hazardous substance or substances from the aquifer, either through active remediation or as a result of naturally occurring biological or chemical processes which can be documented to occur at the facility, except as provided in section 20118(5) and (6) of the act.

Mich Admin R 299.3. Simply stated, the aquifer protection rules require "...removal of hazardous substances from the aquifer ... through active remediation..." and prohibit expansion of such hazardous substances exceeding residential cleanup criteria after the initiation of cleanup. Section 20118(5) and (6) of Part 201, referenced in the aquifer protection rules, provide that EGLE can waive compliance with the rules in very limited situations. MCL 324.20118.

EGLE concluded in its Decision Document for addressing the Unit E plume that:

[E]xtracting and treating contaminated groundwater in the vicinity of Wagner Road and Maple Road, coupled with capture of the “leading edge” of contamination is necessary to comply with Part 201, and the Consent Judgment. The performance objectives for the groundwater extraction in the vicinity of Maple Road, the vicinity of Wagner Road, and for the leading edge are that, once initiated, a hydraulic barrier should be created to halt the further migration of concentrations of 1,4-dioxane above 85 ppb [the drinking water cleanup criterion] in the downgradient or easterly direction.

**Ex. C**, p. 2. Nevertheless, EGLE determined that, if Gelman instead satisfied six conditions, capture of the leading edge of the plume would not be necessary. *Id.* One of those six conditions was “[p]revention of any further migration of 1,4-dioxane contamination beyond Maple Road in excess of 2,800 ppb (the criterion protective of surface water).” *Id.*, p. 12.

Gelman’s preferred alternative to address Unit E relied on an institutional control to prevent consumption of contaminated groundwater. Gelman argued that the Court had the power to issue such a control based on the Court’s inherent authority to enforce its judgments and issue any order to fully execute its judgments. **Ex. D**, Supp. Filing in Support of Remedial Alternative, p. 5-6, citing MCL 600.611, *Cohen v Cohen*, 125 Mich App 206 (1983), and *Spurling v Battista*, 76 Mich App 350 (1977). Gelman also agreed to prevent migration of 1,4-dioxane downgradient of Maple Road in excess of 2,800 ppb. *Id.*, p. 8-9.

In 2004, the Court entered its Opinion and Order Regarding Remediation of the Contamination of the “Unit E” Aquifer (“Unit E Order”). **Ex. E**. The Court first addressed the questions the parties had raised “about the applicability of the Consent Judgment to Unit E, the responsibility of the Court to review EGLE actions, and the scope of the Court’s role in this process.” *Id.*, p. 3. The Court found that the Unit E plume was subject to the consent judgment and that the Court “has the inherent and equitable powers to enforce its judgment with all appropriate measures and sanctions as to Unit E contamination.” *Id.*, p. 4. The Court further

determined that it had broad authority to review EGLE actions and broad powers to assure that the cleanup of the 1,4-dioxane was achieved “as soon as possible.” *Id.* p. 4-5.

The Court then found that “[t]he goal set by the [EGLE] of total capture of the width of the plume is certainly appropriate – if it can be done....[T]he primary [EGLE] rationale is that controlling groundwater contamination at or near its source is more efficient than trying to capture it later as it spreads through the aquifer. There is ample support for that position.” *Id.* p. 7-8. The Court ordered Gelman to perform an investigation and submit a work plan to EGLE which would, “to the maximum extent feasible, prevent further migration of groundwater contamination above 85 ppb of 1,4-dioxane [the drinking water standard at the time] eastward into the Unit E aquifer.” *Id.*, p. 9.

The Court then moved to address the contamination that had already spread eastward into the Unit E aquifer. It first observed that although it would not be possible to extract all 1,4-dioxane from the aquifer, “the goal must be to remove as much of the contaminant as possible, as quickly as possible, so that the ultimate dilution will take place with minimal impact on the water resource.” *Id.* The Court then addressed the dispute between the parties over the conditions that EGLE required to grant a waiver from the aquifer protection rules. One of those conditions was use of an institutional control to restrict groundwater use. The Court directed the parties to submit an order establishing an area where use of groundwater would be prohibited. The Court later entered such an order in 2005, titled Order Prohibiting Groundwater Use (“Prohibition Zone Order”). **Ex. F.** It was that order that first established the “Prohibition Zone.” Finally, the Unit E order required Gelman to submit a work plan to MDEQ within 30 days from the Unit E Order for the treatment and reinjection of Unit E water. **Ex. E**, p. 9-10. The Court directed that the

work plan “will be designed to purge enough water so that any water escaping from the purging zone in Unit E will not exceed 2,800 ppb recommended by [EGLE].” *Id.*, p. 10.

**D. The Consent Judgment is amended a third time to address new cleanup criteria and increased knowledge of the contamination (2009 – 2011).**

In 2009, the Court entered an Order Regarding Potential Remedial Modifications. **Ex. G.**

The Court observed:

The parties have decided to explore possible modification of the cleanup program that incorporates a coherent remedial approach to the groundwater contamination and reflects changes in state environmental law over time, the parties’ current knowledge of site conditions, and the previous rulings of the Court. Over the last number of months, the parties have been discussing potential modifications to the cleanup program. The goal of any modifications will be to continue to protect the public while increasing the effectiveness and efficiency of the cleanup.

*Id.*, p. 2. At the time, the parties were still working on the proposed modifications but were considering the following cleanup objectives: (1) prevention of contamination from migrating past the Prohibition Zone boundaries, as established by the Court in 2005; (2) monitoring of the migration of contamination within the Prohibition Zone to ensure that it does not expand beyond the Prohibition Zone or underflow the Huron River; (3) continued mass removal through continued operation of existing extraction wells and installation of at least one additional extraction well; and (4) continued prevention of “groundwater with concentrations exceeding 2,800 ppb (the groundwater/surface water interface criterion) from migrating east of Maple Road in order to insure that levels above the GSI criterion do not reach the Huron River.” *Id.*, p. 3-4. The Court established a schedule for considering the proposed modifications.

After additional negotiations between the parties, in 2011 the Court entered the Third Amendment to Consent Judgment. **Ex. H.** The Third Amendment implemented a number of changes to the cleanup regime, including revisions to the cleanup criteria and expansion of the Prohibition Zone. The Third Amendment also divided the cleanup program into two main

systems, Western Area and Eastern Area, based on the location of the remedial activities in relation to Wagner Road. The Maple Road containment objective, which the parties previously negotiated as part of the establishment of the original Prohibition Zone, was expressly maintained:

The current Unit E objective set forth in the Unit E Order of preventing contaminant concentrations above the groundwater-surface water interface criterion of 2,800 ug/l (subject to approval by the Court of the application of a new criteria) from migrating east of Maple Road shall apply to the Eastern Area System, regardless of the aquifer designation, or depth of groundwater or groundwater contamination.

*Id.*, p. 4-5. The Third Amendment also required Gelman to meet the generic GSI criterion at other points (e.g., the Honey Creek Tributary and Third Sister Lake, see, *id.*, p. 24-25), even though Part 201 allowed application of mixing-zone based criteria.<sup>6</sup> See, 228 PA 2010.

Although the Prohibition Zone was expanded, the Third Amendment required Gelman to maintain the integrity of the expanded boundary and, in particular, the parties agreed that “any further expansion of the northern boundaries of the Prohibition Zone or Expanded Prohibition Zone...should be avoided, unless there are compelling reasons to do so.” **Ex. H**, p. 6.

In connection with entry of the Third Amendment, the Court entered a Stipulated Order Amending Previous Remediation Orders. **Ex. J**. That Order recited that “the Court has also supplemented the Consent Judgment with several cleanup related orders, based on information about the nature and extent of contamination acquired after the Consent Judgment and the Amendments were entered,” including the REO, Unit E Order, and the Prohibition Zone Order. *Id.*, pp. 2-3. The Order further recited that “[s]ince entry of the REO and the Unit E Order, the parties have further refined their understanding of the nature and extent of contamination at the

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<sup>6</sup> “A mixing zone is an allocated portion of the receiving surface water body where venting groundwater discharge is mixed with surface waters. The mixing zone is used to develop mixing zone-based GSI criteria.” **Ex. I**, RRD Policy and Procedure No. 33, p. 2.

Gelman Site, which is reflected in the Third Amendment.” *Id.*, p. 3. The Order did not supersede the prior cleanup orders in full; it simply provided that the Third Amendment would control in the event of an inconsistency with the prior cleanup orders. *Id.*

**E. The state significantly lowers cleanup criteria and negotiations begin over a fourth amendment to the Consent Judgment (2016).**

In October 2016, EGLE released the results of a shallow groundwater investigation, revealing the presence of 1,4-dioxane in two test wells in a residential area just west of downtown Ann Arbor.

Almost immediately after this discovery, EGLE issued a “finding of emergency”:

Releases of 1,4-dioxane ... **pose a threat to public health, safety or welfare of its citizens and the environment.** Recent shallow groundwater investigations in the Ann Arbor area have detected 1,4-dioxane in the groundwater in close proximity to residential homes.... The extent of 1,4-dioxane groundwater contamination ... is unknown; and 1,4-dioxane contamination is expected to be present beneath many square miles of the City of Ann Arbor occupied by residential dwellings. **[T]he current cleanup criteria ... are not protective of public health.**  
**Ex. K** (emphasis added).

As part of its emergency order, EGLE imposed stricter cleanup criteria. *Id.* Prior to the emergency order, the 1,4-dioxane cleanup criterion for drinking water was 85 ppb. EGLE concluded that standard to be “outdated and not protective of public health,” and tightened the criterion, on an emergency basis, to 7.2 ppb. *Id.* EGLE later published rules making the change to 7.2 ppb permanent, and lowering the GSI criterion from 2,800 ppb to 280 ppb.

In light of these events, EGLE and Gelman began negotiating a further amendment to the consent judgment. The Court later granted Intervenors’ petitions to intervene and the parties (EGLE, Gelman and the Intervenors) engaged in lengthy settlement negotiations, culminating in the Proposed 4<sup>th</sup> CJ (attached as **Ex. L**) that the Court made public in an August 31, 2020 Order. Some of the most significant changes to the Current Court Orders included in the Proposed 4<sup>th</sup>

CJ include: (1) expansion of the Prohibition Zone boundary to account for the reduction in the drinking water standard from 85 ppb to 7.2 ppb; (2) installation of new monitoring wells to further investigate the migration of 1,4-dioxane; (3) establishment of trigger levels to serve as an early warning system and require action to prevent the migration of contamination beyond the Prohibition Zone boundary before it occurs; (4) installation of multiple new extraction wells; and (5) implementation of new remediation techniques on the Gelman property (phytoremediation and heated soil vapor extraction). See Summary of Key Differences Chart at pp. 2-4, *supra*.

After an extensive public comment period, the governing bodies of the Intervenors voted not to approve the Proposed 4th CJ. There were numerous reasons for the rejection, but primarily the Intervenors wanted more extraction of 1,4-dioxane from the aquifers, believed that extraction and treatment of groundwater from the proposed Parklake extraction well was appropriate but did not believe the treated water should be discharged to First Sister Lake, wanted delineation of the plume to the drinking water standard of 7.2 ppb and wanted more monitoring wells to detect further migration of the plumes. After the votes, the Court held a status conference on November 19, 2020 at which it directed the parties to explain at a hearing before the Court how they believe the existing cleanup regime should be modified, and to provide the legal and technical justifications for their positions.

### **III. LEGAL FRAMEWORK FOR GELMAN RESPONSE ACTIVITIES**

Gelman's obligations in this matter stem from two main sources: (1) the statute itself, Part 201; and (2) the Current Court Orders. The Current Court Orders require Gelman to undertake various response activities to address the 1,4-dioxane that originated from the Gelman site. However, none of the Current Court Orders has been revised to reflect the 2016 revisions to the cleanup criteria. Similarly, Part 201 imposes various obligations on a party to address contamination for which the party is liable.

The Third Amendment to Consent Judgment (which is part of the Current Court Orders) provides various means by which the Court can modify the existing cleanup regime. For example, Article XVI, which was in the original Consent Judgment and has continued through the Third Amendment, provides that the Court is the ultimate arbiter of disputes between EGLE and Gelman. These disputes include substantive modifications to the cleanup regime (e.g., EGLE's choice of alternatives to address the possibility that contamination is going to migrate outside of the Prohibition Zone, see Third Amendment, p. 6). The consent judgment also gives EGLE the right to ask the Court to order additional response activities if, for example, new information comes to light concerning the contamination or EGLE adopts more restrictive cleanup criteria. Third Amendment, p. 30. The Court also has inherent and equitable powers to enforce its judgments and orders. EGLE and Gelman each have invoked these powers at various times over the course of this case when seeking the Court's intervention and the Court has relied on those powers to, for example, enter supplemental remediation orders (i.e., the REO, the Unit E Order, and the Prohibition Zone Order).



Part 201 is the current, primary statutory framework for remediation of contaminated property in Michigan.<sup>7</sup> The remedial obligations under Part 201 are focused in large part on “liable parties.” One of the classes of liable parties under Part 201 is “[t]he owner or operator of a facility if the owner or operator is responsible for an activity causing a release or threat of release.” MCL 324.20126(1)(a). A “facility” is defined as “any area, place, parcel or parcels of property, or portion of a parcel of property where a hazardous substance in excess of the concentrations that satisfy the cleanup criteria for unrestricted residential use has been released,<sup>8</sup> deposited, disposed of, or otherwise comes to be located.” Gelman’s property is a “facility” because hazardous substances, including 1,4-dioxane, have been released, deposited, and disposed of in excess of cleanup criteria. Gelman is liable for the contamination on its property because it owns and operated the property and is responsible for an activity causing a release.

A liable party must, among other things, “determine the nature and extent of the release at the facility,” “[i]mmediately stop or prevent an ongoing release at the source,” and “diligently pursue response activities<sup>9</sup> necessary to achieve the cleanup criteria established under [Part 201].” MCL 324.20114(1)(a), (c), (g). A liable party is jointly and severally liable for response

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<sup>7</sup> The Third Amendment incorporates by reference several provisions of Part 201. See, e.g., Third Amendment, p. 11, referring to the authority of the Court under MCL 324.20135a to grant a liable party access to property in order to conduct response activities.

<sup>8</sup> “Release” broadly includes “any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing of a hazardous substance into the environment, or the abandonment or discarding of barrels, containers, and other closed receptacles containing a hazardous substance.” MCL 324.20101(1)(pp).

<sup>9</sup> “Response activity” includes “evaluation, interim response activity, remedial action, demolition, providing an alternative water supply, or the taking of other actions necessary to protect the public health, safety, or welfare, or the environment or the natural resources. Response activity also includes health assessments or health effect studies carried out under the supervision, or with the approval of, the department of community health and enforcement actions related to any response activity.” MCL 324.20101(1)(vv). “Remedial act” includes “cleanup, removal, containment, isolation, destruction, or treatment of a hazardous substance released or threatened to be released into the environment, monitoring, maintenance, or the taking of other actions that may be necessary to prevent, minimize, or mitigate injury to the public health, safety, or welfare, or to the environment.” MCL 324.20101(1)(qq).

activity costs incurred by the state or another person and damages to natural resources. MCL 324.20126a.

In selecting or approving a remedial action, the following must be considered:

- (a) The effectiveness of alternatives in protecting the public health, safety, and welfare and the environment.
- (b) The long-term uncertainties associated with the proposed remedial action.
- (c) The persistence, toxicity, mobility, and propensity to bioaccumulate of the hazardous substances.
- (d) The short- and long-term potential for adverse health effects from human exposure.
- (e) Costs of remedial action, including long-term maintenance costs. However, the cost of a remedial action shall be a factor only in choosing among alternatives that adequately protect the public health, safety, and welfare and the environment, consistent with the requirements of section 20120a.
- (f) Reliability of the alternatives.
- (g) The potential for future response activity costs if an alternative fails.
- (h) The potential threat to human health, safety, and welfare and the environment associated with excavation, transportation, and redisposal or containment.
- (i) The ability to monitor remedial performance.
- (j) For remedial actions that require the opportunity for public participation under section 20120d, the public's perspective about the extent to which the proposed remedial action effectively addresses requirements of this part.

MCL 324.20120(1).

Where EGLE determines that “there may be an imminent and substantial endangerment to the public health, safety, or welfare, or to the environment because of an actual or threatened release from a facility,” Part 201 authorizes the attorney general to bring an action against a liable party to secure appropriate relief and “the court has jurisdiction to grant such relief as the public interest and the equities of the case may require.” MCL 324.20126a(6).

#### **IV. REQUESTED MODIFICATIONS TO GELMAN’S RESPONSE ACTIVITIES FOR THE PROPOSED “2021 ORDER”**

The existing cleanup regime under the Current Court Orders does not adequately address the Gelman 1,4-dioxane contamination. The changes in the Proposed 4th CJ are improvements and are necessary, but they still are technically and scientifically insufficient. Int Exp Rept, p. 5. To assure that Gelman’s response activities are sufficient, to the extent of current scientific knowledge, the court should issue a “2021 Order” that requires Gelman to perform all aspects of the Proposed 4th CJ, but with the additions and modifications described below. For each requested modification, the Intervenor provides (1) an explanation of the response activity topic at issue and the language in the Proposed 4th CJ that addresses that activity, (2) an explanation of the legal and scientific basis for the modification, and (3) proposed language to add to or modify what is in the Proposed 4th CJ to effectuate the modification. A document incorporating all of the combined language into a proposed 2021 Order is attached as **Ex. M**.

**A. Additional Delineation of Gelman's 1,4-Dioxane is Necessary.**

**1. Gelman's plumes have not been delineated adequately under the Current Court Orders.**

As described in earlier sections, Part 201 requires a liable owner/operator of a facility, among other things, to "...determine the nature and extent of the Release at the facility." MCL 324.20114(1)(a). In other words, Gelman must test and determine where (how far, how wide and how deep) the 1,4-dioxane has spread from its property, and where it will go next. This is referred to as "delineation" of the plume(s) of contamination. Knowing the nature and extent of the 1,4-dioxane plumes is necessary to design and implement effective remedial measures to contain and cleanup the contamination. Int Exp Rept, p. 6.

As professor Lemke explained (at Int Exp Rept, p. 6), Gelman's 1,4-dioxane plumes have not been adequately delineated for two principal reasons. First, neither the state nor Gelman publicly has used current monitoring well system data to determine the extent of the plumes, and depict them on groundwater plume maps, under Michigan's new groundwater cleanup criteria (e.g., 7.2 ppb for drinking water and 280 ppb for GSI). Second, even if new plume maps were prepared, the gaps between the existing monitoring wells are too large to assure they are accurate. Simply stated, narrow plumes in this heterogeneous aquifer system easily may have slipped undetected through those gaps.

Over the decades Gelman's 1,4-dioxane plumes have proved to be elusive. Because of the heterogeneous geology below ground, narrow plumes have moved in a variety of unpredictable directions and at varying depths. The Intervenor experts describe the scientific circumstances as follows:

The glacial aquifer system affected by the Gelman 1,4-dioxane contamination is highly heterogeneous, consisting of a complicated mixture of very permeable sand and gravel units interspersed with less permeable silts and clays making it difficult to determine connected

groundwater flow pathways. As a consequence, the plumes have moved in a variety of directions and at different depths, making it difficult to predict contaminant movement. Int Exp Rept, p. 5.

Several times, Gelman’s experts have discovered that their beliefs, of the extent and migration pathways of the 1,4-dioxane contamination, were incorrect. As a prime example, in 2001 Gelman discovered a previously unknown and unexpected 1,4-dioxane plume, following a pathway deeper under the ground, that had migrated into the Evergreen subdivision. That eventually led to the court’s 2004 Unit E Order. **Ex. E.** Even now, nearly two decades later, under the Current Court Orders (see, in particular, the Third Amendment to the Consent Judgment), from a scientific/technical perspective one cannot conclude that the Gelman 1,4-dioxane plumes have been delineated adequately because large gaps are present in the monitoring well system. As noted in the Intervenor experts’ opinion, in 2016 EGLE concluded that the extent of Gelman’s contamination was unknown and to date that lack of knowledge has not been remedied:

At the present point in time, the extent of groundwater contamination (i.e., 1,4-dioxane concentrations at 7.2 ppb or more) emanating from the Gelman Site has not been fully defined. When promulgating emergency rules setting the 7.2 parts per billion (ppb) 1,4-dioxane residential drinking water cleanup criterion in 2016, EGLE (then MDEQ) stated: “The extent of 1,4-dioxane groundwater contamination...greater than 7.2 parts per billion is unknown (MDEQ, 2016).”

Since that time, neither Gelman’s technical experts nor EGLE’s technical experts have publicly presented a map showing 7.2 ppb or 1.0 ppb (the analytical detection limit) concentration lines based on currently available data. Consequently, we have relied upon maps generated by our own technical consultants and the Washtenaw County Health Department. Uncertainty in the present-day distribution of 1,4-dioxane and the location of 1,4-dioxane migration pathways gives rise to four primary Intervenor concerns regarding the proposed Fourth Amended and Restated Consent Judgment (Proposed 4<sup>th</sup> CJ):

- 1A. Contaminant delineation maps
- 1B. Perimeter monitoring well gaps
- 1C. Unwarranted Prohibition Zone expansion

1D. Northward migration toward Barton Pond. Int Exp Rept, p. 6.

Suggested language for implementing proposed additional requirements is provided in section IV.A.5 of this brief, below.

**2. New updated plume maps should be required.**

The Proposed 4th CJ does not contain any requirement that Gelman prepare and update plume maps on a continuing basis. The Intervenor experts explain why having such updated plume maps are critical to determine remedial measures and to evaluate their effectiveness:

**Scientific Rationale.** Up-to-date maps depicting the extent of 1,4-dioxane contamination are essential tools needed by all stakeholders including Gelman, EGLE, and the general public. Such maps provide a basis for assessing attainment of remedial objectives, assuring compliance with regulatory standards, evaluating the efficacy of remedial activities, documenting changes in contaminant distributions over time, and evaluating risks of future impacts on drinking water supply wells in the surrounding communities.

Given the frequency with which monitoring wells are sampled across the Gelman Site, semi-annual updates such as those currently provided in Quarterly Reports are appropriate and should be required as part of any court order providing comprehensive requirements that are necessary to address the Gelman dioxane. Int Exp Rept, p. 6.

To correct this deficiency, plume maps should be required, and updated semi-annually, which depict the extent of contamination, at 280 ppb, 7.2 ppb and 1 ppb. Suggested language for implementing such requirements is provided in section IV.A.5 of this brief, below.

**3. The new Monitoring Well clusters<sup>10</sup> required in the Proposed 4th CJ are necessary but insufficient.**

The Proposed 4th CJ would require several additional monitoring well clusters in the Eastern Area, in the Downgradient Area Within the Prohibition Zone (“PZ”), and in the Western Area, all of which will improve delineation of the nature and extent of the Gelman 1,4-dioxane plumes and help predict where those plumes will migrate in the future. The Proposed 4th CJ provides for 14 new clusters of Monitoring Wells<sup>11</sup> at locations designated as A, B, C (on northern PZ boundary) (p. 12), D, E (near southern PZ boundary<sup>12</sup>) (p. 12), F, G, H (downgradient areas within PZ) (p. 22), I, J, K, L, M, and N (Western Area locations) (p. 34). All of these locations are described and depicted on maps contained in the Intervenors’ Expert Report.

Technically and scientifically, these 14 added Monitoring Well clusters are necessary and appropriate, but they are not sufficient, because they leave substantial gaps through which narrow 1,4-dioxane plumes may be moving undetected. As stated in the Intervenors’ Expert Report:

Both the Eastern Area Prohibition Zone Containment Objective and the Western Area Non-Expansion Cleanup Objective stated in the Proposed 4<sup>th</sup> CJ share the goal of preventing 1,4-dioxane from migrating beyond the (revised) Prohibition Zone area of institutional control (Eastern Area) or present known extent of groundwater contamination (Western Area). Thus, the Proposed 4th CJ includes perimeter monitoring wells intended to serve as sentinel wells, boundary wells, delineation wells, and compliance wells. Those additional monitoring wells are all necessary to help delineate the extent of groundwater contamination, but are insufficient because gaps in the monitoring well network remain along

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<sup>10</sup> Monitoring Well cluster means that at a particular location multiple wells are installed to assess if dioxane concentrations differ at varying depths below the ground (e.g., shallow, intermediate, and deep).

<sup>11</sup> To simplify the discussion these are referred to throughout this brief simply as Monitoring Well locations, but all actually are Monitoring Well clusters.

<sup>12</sup> The Intervenor experts agree that the PZ Boundary Well E is necessary, but asserts that its location should be adjusted, as shown on the map in the Intervenors’ Expert Report.

the northern perimeter of the Eastern Area Prohibition Zone and the southern boundary of the Western Area dioxane plume. Gaps in the Eastern Area are significant because Scio Township residences, which rely on well water, and Barton Pond, which supplies the majority of Ann Arbor's municipal drinking water, are located north of the Prohibition Zone. The Western Area gap arises from the abandonment of MW-63, the southwestern most point in the compliance well network, in 2019. Int Exp Rept, p. 7.

**4. Additional monitoring necessary to determine the extent of Gelman's 1,4-dioxane to address the above shortcomings.**

**i. PZ Perimeter Gap filling requires two additional Sentinel Wells in the Eastern Area and one replacement for former MW-63 in the Western Area.**

The Intervenor Expert Report (pp. 7-9) makes clear that three additional Monitoring Well clusters, beyond those in the Proposed 4<sup>th</sup> CJ, are needed to help delineate the perimeter of the plumes in the PZ.<sup>13</sup> In the Eastern Area two additional Sentinel Well clusters (called AA and BB) are needed and in the Western Area a replacement is needed for the former MW-63 location. The Intervenor experts depict these locations on maps within their report and describe them as follows:

Additional monitoring well clusters in strategically important areas are needed to ensure early detection of contaminant migration to the north and potential expansion of the Western Plume to the southwest. Monitoring well clusters include nests of wells with screened intervals at different elevations designed to detect 1,4-dioxane migrating through different layers of the glacial aquifer system. Multiple screens are necessary because it is difficult to know with certainty at what level contaminated water will migrate until it arrives at a monitoring well. Locations where additional monitoring well clusters are needed include:

- A Sentinel Well (AA) closing the gap between MW-133 and MW-121
- A Sentinel Well (BB) near the northeast Prohibition Zone boundary between MW-135 and MW-97
- A replacement well (CC) in the vicinity of the former MW-63 well cluster. Int Exp Rept, p. 7.

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<sup>13</sup> Of course, the adequacy of these proposed wells is based on the degree of current scientific knowledge. If that changes in the future, additional monitoring could be needed.



The Intervenor experts describe the reasons that these locations are necessary to narrow the open gaps in the monitoring well system, and provide the Scientific Rationale for these additional wells as follows:

**Scientific Rationale.** The rationale for including additional, more closely-spaced monitoring wells to detect potential migration along the perimeter of the known contamination extent relies on observations of 1,4-dioxane concentrations and migration in areas of densely-spaced monitoring wells. For example, in the area east of Wagner Road, wells MW-71 and MW-108s/d are spaced less than 200 feet from each other, yet display remarkably different concentration histories, despite being screened at the same elevation. Further downgradient, east of Maple Road, dioxane concentrations in MW-86 have been consistently non-detect, despite the fact that MW-86 is located approximately midway between MW-82s and MW-83s, which have seen dioxane concentrations as high as 370 and 645 ppb, respectively. These observations indicate that contaminant transport pathways are narrower and more complex than shown on most site maps, and that bypassing of monitoring wells, either laterally or vertically, is possible. Large gaps between monitoring wells along the plume perimeter should therefore be avoided, particularly in sensitive areas proximal to residences relying on private drinking water wells. Int Exp Rept, p. 9 (emphasis in original).

**ii. Gap filling to assess possible northward migration of 1,4-dioxane toward Barton Pond requires new Monitoring Wells.**

Barton Pond supplies the majority of Ann Arbor's drinking water. The pond lies directly north of the PZ, but no wells have been installed to determine if 1,4-dioxane is migrating in that direction toward the Pond, or if the subsurface geology is comprised of materials that would permit such a migration. While technical experts believe it is unlikely that the 1,4-dioxane plumes will migrate north to Barton Pond, if a narrow plume did migrate, the consequences would be enormous. The Intervenor experts describe the circumstances and conclude that three new monitoring wells (at locations DD, EE and FF) should be installed and monitored. Int Exp Rept, p 14. They depict these locations on maps in their report and state as follows:

**Scientific Rationale.** In a recent study prepared for the City of Ann Arbor, environmental consultants at Tetra Tech evaluated potential sentinel monitoring well locations to provide advance warning to protect the City's drinking water supply in the event that the Gelman 1,4-dioxane plume were to migrate towards Barton Pond (Tetra Tech, 2020). Tetra Tech identified four potential sentinel well locations (**Figure 7**) based on their relation to topographic elevations and position opposite the surface water drainage divide. The additional wells proposed by the Intervenors are consistent with Tetra Tech's recommendations. *Id.*

**iii. Added delineation needed to evaluate 1,4-dioxane above GSI limits approaching and hitting Allen Creek.**

To protect Allen Creek and the Huron River, the Current Court Orders required Gelman to prevent any 1,4-dioxane exceeding the 2,800 ppb groundwater-surface water interface (GSI) cleanup criterion from migrating east of Maple Road. That criterion was reduced in 2016 to 280 ppb. Unfortunately, groundwater with 1,4-dioxane exceeding 280 ppb already is east of Maple Road, and the plumes are hitting Allen Creek. For example, samples taken from 2017 to 2020 have shown rapidly rising concentrations (now up to 49 ppb). As the Intervenor experts explain, that means that the concentrations entering the creek are much higher and may exceed the GSI limit. Int Exp Rept, p. 17. To fully evaluate the issues, as detailed at Int Exp Rept, pp. 17 – 25, the Intervenor experts describe three additional delineation actions that are necessary to determine the extent of the plumes with high concentrations, to allow these concerns to be addressed:

To address concerns over discharge to Allen Creek at concentrations exceeding the GSI criterion, the Intervenor propose the following additions to activities included in the Proposed 4<sup>th</sup> CJ:

- 2A. High-resolution characterization to identify downgradient migration pathways
- 2B. Additional delineation of 280 ppb extent in the downgradient Eastern Area
- 2C. Shallow groundwater monitoring along the Allen Creek Drain. *Id.*, p 17.

**a. Two sets of Transects are necessary to provide the high resolution characterization referenced as 2A, above.**

The Intervenor experts depict on maps and describe these high resolution efforts as two North-South lines of temporary bore hole transects: one line along Maple Road between Dexter and Miller Roads; and the other line along Glendale-Grandview-Westwood streets near MW-82s. As the Intervenor experts note, the U.S. Environmental Protection Agency has identified this type of site characterization as a preferred method for evaluating sites. The physical boring efforts are described as follows:

Temporary boreholes in each transect should be placed at a 200-foot minimum lateral spacing and water samples should be taken at 10-foot vertical increments to establish a concentration profile at each borehole location. Results can be used to position permanent monitoring wells in zones of highest observed concentrations, quantify contaminant mass flux across each transect, and to guide additional downgradient investigation (Sections 2B and 2C). Two north-south profiles (perpendicular to the primary direction of groundwater flow) are needed (**Figure 10**): *Id.*, p 19.

The Intervenor experts' full description of and scientific rationale for these transects is provided at Int Exp Rept, p 19 - 22. In essence, these transects are needed to identify the flow pathways (the position and the depth) of Gelman's 1,4-dioxane plumes headed to Allen Creek, which to date have never been determined.

- b. Two additional Monitoring Well clusters are needed to delineate the 280 ppb extent of 1,4-dioxane in downgradient parts of the Eastern Area, to address 2B, above.**

As noted earlier, Section V.A.5.f., the Proposed 4th CJ (at p 22) would require three wells at locations F, G and H to help determine the downgradient extent of Gelman’s 1,4-dioxane plumes within the PZ. However, the Intervenor experts explain that these wells alone are insufficient to delineate the extent of contamination exceeding the 280 ppb GSI criterion necessary to ensure that the Groundwater Surface Water Objective in the Eastern Area is met. They note that the currently highest downgradient measurements are at MW-82s, but that location likely is not the leading edge or the centerline of the most contaminated groundwater. As stated by the Intervenor experts, it is more likely that “...MW-82s represents lateral dispersion (like MW-76s or MW-91) from one or more unrecognized higher concentration finger(s) of 1,4-dioxane migrating north or south of MW-82....” Int Exp Rept, p 23. Therefore, it is necessary to install additional monitoring wells to locate and depict the true downgradient extent of contamination exceeding 280 ppb. While wells F, G and H are needed, the Intervenor experts demonstrate that two more wells designated as GG and HH also are necessary.

**Scientific Rationale.** The proposed monitoring well at location GG on the south side of MW-82s will complement the proposed well at location H on the north side of MW-82s (**Figure 14**). Both of these locations can be optimized based on the results of transect T<sub>2</sub>-T<sub>2</sub>'. Monitoring wells at locations GG and H will determine if higher concentrations of 1,4-dioxane are flanking MW-82s. An additional proposed monitoring well at location HH in the Allen Creek surface drainage way, will investigate the potential for 1,4-dioxane at concentrations above GSI along the expected migration pathway through a loosely defined area of artesian groundwater conditions conducive to additional venting to the Allen Creek Drain or the creation of shallow groundwater conditions at elevations close to residential basements in this area. Together, monitoring wells at proposed locations GG and HH will help to ensure that the Eastern Area “Groundwater Surface Water Interface Objective” in the Proposed 4<sup>th</sup> CJ is met. Int Exp Rept, p 23.

c. **Shallow groundwater profiling is necessary along Allen Creek Drain, as noted in 2C, above.**

As succinctly stated by the Intervenor experts:

In addition to the delineation work (transects and monitoring wells) described above, it is necessary to identify the extent of groundwater contamination greater than 280 ppb entering the Allen Creek Drain upgradient of West Park so that appropriate response activities can be undertaken. Int Exp Rept, p 24.

This would be “a high-resolution profiling survey along the edges of the South Branch of the Allen Creek Drain...” (*Id.*), followed by the installation of three or more “shallow groundwater monitoring nests along each side of the Allen Creek Drain where the presence of groundwater at or above GSI concentrations has been delineated.” *Id.*

Groundwater samples along the high-resolution profiles would be taken every five feet in depth, from a series of temporary wells, placed 100 feet apart, along both sides of the drain to a minimum depth 10 feet or more below the drain. These locations are depicted on maps and described at Int Exp Rept, pp. 24-25, along with the following scientific rationale for the efforts:

**Scientific Rationale.** High-resolution profiles of groundwater concentrations will provide information about the distribution of 1,4-dioxane in excess of 280 ppb near the Allen Creek Drain. Establishing maximum concentrations is part of the requirement for use of the mixing zone criterion for GSI compliance under Part 201, as is estimating the cross-sectional area of the plume perpendicular to the groundwater flow that encompasses the entire portion of the plume exceeding GSI. Both of these requirements will be facilitated by the Drain profiles and the permanent, shallow groundwater monitoring well nests installed after the profiles are completed. Moreover, the wells can serve as alternative monitoring points (in the parlance of the GSI regulations) that will provide continuing information about the distribution of 1,4-dioxane in excess of 280 ppb near the Allen Creek Drain. Int Exp Rept, p 25.

**5. Proposed provisions to include in the 2021 Order to properly delineate Gelman’s 1,4-dioxane contamination.**

To address the delineation issues discussed in sections IV.A.1 through IV.A.4, above, Intervenor propose that the 2021 Order contain the following sections from the Proposed 4th CJ, with the modifications and additions proposed above by the Intervenor typed in red.

(1) The 2021 Order should contain the following language from Section XII (pp. 56-57) of the Proposed 4th CJ, adding a new sub-section B to require plume maps, which would be updated semi-annually [with new language shown in red]:

**“XII. PROGRESS REPORTS AND UPDATED PLUME MAPS**

**A.** Defendant shall provide to EGLE written quarterly progress reports that shall: (1) describe the actions which have been taken toward achieving compliance with this Order during the previous three months; (2) describe data collection and activities scheduled for the next three months; and (3) include all results of sampling and tests and other data received by Defendant, its consultants, engineers, or agents during the previous three months relating to Remedial Action performed pursuant to this Order. Defendant shall submit the first quarterly report to EGLE within 120 days after entry of this Order, and by the 30th day of the month following each quarterly period thereafter, as feasible, until termination of this Order as provided in Section XXVI.

**B.** Gelman shall utilize all available existing monitoring well data to determine by appropriate hydro-geologic techniques the extent of various concentrations of 1,4-dioxane in groundwater in concentration intervals that are approved by EGLE, which shall include down to concentrations of 1 ppb, 7.2 ppb and 280 ppb and Gelman shall graphically depict plume maps showing those extents of 1,4-dioxane on maps that shall be publicly disclosed. Gelman shall re-determine the extent of the 1,4-dioxane at various concentrations in groundwater semi-annually and shall prepare and publicly disclose updated plume maps. “

(2) The 2021 Order should contain the following language from Sections V.A.3. a-d (pp. 12-13) of the Proposed 4th CJ, regarding the Eastern Area Sentinel Well and PZ Boundary Well requirements (showing requested modifications in red):

“3. Monitoring and Extraction Well Installation and Operation. Defendant shall install the following additional wells in the Eastern Area according to a schedule approved by EGLE and subject to access and receipt of any required approvals pursuant to Section VII.D:

“a. Sentinel Well Installation. Defendant shall install the following three monitoring well clusters to monitor movement of 1,4-dioxane south of the

northern Prohibition Zone boundary, in addition to MW-120, MW-123, and MW-129 that are already in place (collectively referred to herein as “Sentinel Wells”):

- i. Residential area in the general vicinity of Ravenwood and Barber Avenues (Location “A” on map attached as Attachment G);
- ii. Residential area in the general vicinity of Sequoia Parkway and Archwood Avenues between Delwood and Center (Location “B” on map attached as Attachment G); and
- iii. Residential area in the general vicinity of Maple Road and North Circle Drive (Location “C” on the map attached as Attachment G);
- iv. Residential area roughly half way between locations of MW-133 and MW-121 (Location “AA” on the map attached as Attachment G);
- v. Residential area, near the northeast PZ boundary, between MW-135 and MW-97 (Location “BB” on the map attached as Attachment G);
- vi. Residential area north of Location C (Location “DD” on the map attached as Attachment G);
- vii. Residential area north of Location C (Location “EE” on the map attached as Attachment G); and
- viii. Residential area north of Location C (Location “FF” on the map attached as Attachment G).”

“b. PZ Boundary Well Installation. Defendant shall install the following two monitoring well clusters to monitor the movement of 1,4-dioxane near the PZ Boundary (collectively referred to herein as “PZ Boundary Wells”):

- i. Residential, commercial, and vacant area east of South Wagner Road, north of West Liberty Road, west of Lakeview Avenue, and south of Second Sister Lake (Location “D” on map attached as Attachment G); and
- ii. Residential area south/southeast of the MW-112 cluster (Revised Location “E” on map attached as Attachment G).”

(3) The 2021 Order should contain the following language from Section V.A.5.f (p.22) of the Proposed 4th CJ, regarding the Eastern Area Downgradient Investigation within the Prohibition Zone (showing requested modifications in red):

“f. Downgradient Investigation. The Defendant shall continue to implement its Downgradient Investigation Work Plan as approved by EGLE on February 4, 2005, as may be amended, to track the Groundwater Contamination as it migrates to ensure any potential migration of Groundwater Contamination outside of the Prohibition Zone is detected

before such migration occurs with sufficient time to allow Defendant to maintain compliance with the Prohibition Zone Containment Objective and to ensure compliance with the Groundwater-Surface Water Interface Objective. Defendant shall, as the next phase of this iterative investigation process investigate the area depicted on the map attached as Attachment G, including the installation of monitoring wells at the following locations subject to access and receipt of any required approvals pursuant to Section VII.D:

- i. A monitoring well nest in the residential area in the general vicinity of intersection of Washington and 7th Streets (Location “F” on Attachment G);
- ii. A shallow well in the residential area in the general vicinity of current monitoring well nest MW-98 (Location “G” on Attachment G); and
- iii. A monitoring well nest in the residential area in the general vicinity of Brierwood and Linwood Streets (Location “H” on Attachment G);
- iv. A monitoring well nest in the residential area in the general vicinity south of MW-82s (Location “GG” on Attachment G); and
- v. A monitoring well nest in the residential area (Location “HH” on Attachment G);
- vi. Install and sample two sets of temporary transect borings set in a roughly N-S line, each boring placed with approximately 200 foot lateral spacing, with groundwater samples to be taken at 10 foot vertical intervals in each boring down to bedrock, with samples to be analyzed for 1,4-dioxane concentrations. The lines of transect borings to be located as follows:
  - a. Line 1 – along Maple Road, from Dexter Road to Miller Road (with Location as depicted on Attachment G); and
  - b. Line 2 – along Glendale-Grandview-Westwood Streets, near MW-82s (with Location as depicted on Attachment G); and
- vii. Install and sample temporary transect borings on both sides of and closely adjacent to the South Branch of the Allen Creek Drain, with each boring placed with approximately 100 foot lateral spacing, with groundwater samples to be taken at 5 foot vertical intervals in each boring down to 10 feet below the base of the drain, with samples to be analyzed for 1,4-dioxane concentrations. (with Location as depicted on Attachment G). Results of the foregoing shallow groundwater profiling will be used to install a minimum of three shallow groundwater monitoring well nests along each side of the Allen Creek Drain where the presence of



groundwater at or above GSI concentrations has been delineated. Each monitoring location should include at least two monitoring wells screened at the equivalent depth of the drain and 5 feet deeper so that a vertical hydraulic gradient can be determined.

- viii. The data from the above wells will be used to guide additional downgradient investigations as necessary to ensure compliance with the Eastern Area Objectives.”

(4) The 2021 Order should contain the following language from Section V.B.3.b. (pp. 33-34) of the Proposed 4th CJ, regarding Western Area Delineation Monitoring Wells (showing requested modification in red):

- “b. Western Area Delineation Investigation. Defendant shall install the following additional groundwater monitoring wells pursuant to a schedule approved by EGLE and subject to the accessibility of the locations and obtaining access and any required approvals under Section VII.D at the approximate locations described below and on the map attached as Attachment G to address gaps in the current definition of the Groundwater Contamination and to further define the horizontal extent of Groundwater Contamination in the Western Area:
  - i. Commercial area north of Jackson Road (across from April Drive) and south of US-Highway I-94, near MW40s&d. (Deep well only) (Location “I” on Attachment G);
  - ii. Commercial area north of Jackson Road (across from Nancy Drive) and south of US-Highway I-94, east of MW-40s&d and west of the MW-133 cluster (Location “J” on Attachment G);
  - iii. Residential area west of West Delhi, north of Jackson Road and south of US-Highway I-94 (Location “K” on Attachment G);
  - iv. Residential area southwest of the MW-141 cluster in the vicinity of Kilkenny and Birkdale (Location “L” on Attachment G);
  - v. Residential area along Myrtle between Jackson Road and Park Road (Shallow Well only) (Location “M” on Attachment G);
  - vi. Residential and vacant area within approximately 250 feet of Honey Creek southwest of Dexter Road (Location “N” on Attachment G); and
  - vii. Location of former MW-63 well cluster (shown on Attachment G). \*\*\*\*”

**B. The Prohibition Zone Should Not Be Expanded as Much as Suggested in the Proposed 4<sup>th</sup> CJ.**

As discussed more fully in Section II.C. of this brief (pp. 11-14 *supra*), Gelman is not automatically entitled to an Institutional Control such as the Prohibition Zone which would allow its contamination to flow away and continue to impact clean aquifers. In 2001, Gelman discovered that 1,4-dioxane had migrated to a deeper aquifer which the parties called "Unit E." EGLE and Gelman disagreed over how to address the contamination and the parties presented the issue to the Court for decision. The fundamental disagreement between the parties was whether Gelman would be required to comply with the aquifer protection rules and, if not, what conditions Gelman would need to satisfy. The aquifer protection rules impose stringent requirements concerning contamination of groundwater in aquifers:

(5) The horizontal and vertical extent of hazardous substance concentrations in an aquifer above the higher of either the concentration allowed by section 20120a(1)(a) [i.e., the generic residential cleanup criteria] or (10) [i.e., the target detection limit or background concentration] of the act, as applicable, **shall not increase after the initiation of remedial actions to address an aquifer**, except as approved by the directors as provided in section 20118(5) and (6) of the act. Mich Admin R 299.3 (emphasis added).

Ultimately, the state agreed to waive the aquifer protection rules and accept a Prohibition Zone, but only if Gelman agreed to assure that no concentrations of 1,4-dioxane exceeding the GSI cleanup criterion would ever be allowed to migrate east of Maple Road. That Maple Road Containment requirement was an integral piece of a bargain which induced the state to agree with a Prohibition Zone. That bargain and the consideration for it should not be lost or overlooked in determining what changes should be allowed now.

When considering any expansion of the existing Prohibition Zone, it is crucial to keep in mind what the Prohibition Zone is, why it was imposed, and what it does. The Prohibition Zone is a type of "institutional control." As opposed to most engineered controls, such as an extraction

well, an institutional control does not remediate contamination. To the contrary, an institutional control is an administrative or legal control used *precisely because* contamination remains in place. See, e.g., MCL 324.20118(d)(ii) (permitting hazardous substances to remain in an aquifer if certain conditions are met, including “enforceable land use restrictions or other institutional controls necessary to prevent unacceptable risk from exposure to the hazardous substances”). Rather than require cleanup, an institutional control typically restricts the use of property in order to control exposure (e.g., a restrictive covenant limiting the use of property to non-residential use). See, e.g., MCL 324.20121. Because of these features, institutional controls are typically used to supplement, not supplant, active remedial measures. See, e.g., MCL 324.20118; 40 CFR 300.430(a)(1)(D) (“EPA expects to use institutional controls such as water use and deed restrictions to supplement engineering controls as appropriate.... The use of institutional controls shall not substitute for active response measures (e.g., treatment and/or containment of source material, restoration of ground waters to their beneficial uses) as the sole remedy unless such active measures are determined not to be practicable, based on the balancing of trade-offs among alternatives that is conducted during the selection of remedy.”).<sup>14</sup>

Unlike many institutional controls, the Prohibition Zone not only restricts the use of Gelman’s property, it limits the rights of numerous property owners spread over an area of 2,000 acres (or 3.2 square miles). Any expansion of the Prohibition Zone will interfere with groundwater rights of additional property owners. An expansion also would allow more natural resources to become or remain polluted without an obligation to remediate or restore them.

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<sup>14</sup> 40 CFR Part 300 is the National Oil and Hazardous Substances Pollution Contingency Plan, the set of regulations used by the EPA at federal Superfund sites.

The Court initially created the Prohibition Zone not for Gelman’s convenience or because it had a right to such an institutional control, but for expediency and to address the exigent public health concerns caused by the discovery of the Unit E aquifer contamination. See, generally, **Ex. E** and **F**. The parties and the Court understood that, while the boundary of the Prohibition Zone could be expanded in the future, any expansion would need to be justified and Gelman could not use the possibility of an expansion to evade its obligations to control the spread of the plume. In the Current Court Orders, Gelman committed to “prevent the plumes of groundwater contamination emanating from the GSI Property [i.e., Gelman’s property] from expanding beyond the current boundaries of such plumes, except into and within the Prohibition Zone and Expanded Prohibition Zone.” **Ex. H**, p 4. Gelman further committed to implement a verification plan “to ensure that any potential migration of groundwater contamination outside of the Expanded Prohibition is detected before it occurs.” *Id.*, p 5. If Gelman determines that groundwater contamination will migrate outside of the Prohibition Zone, it is required to conduct a feasibility study to determine the options available to prevent the migration from occurring. Although Gelman can propose expanding the Prohibition Zone as an option in the feasibility study, Gelman agreed that such an expansion would be a last resort. See, e.g., *id.*, p. 6 (“[t]he parties agree that any further expansion of the northern boundaries of the Prohibition Zone or Expanded Prohibition Zone should be avoided, unless there are compelling reasons to do so.”); see also, Section V.A.2.f of the Proposed 4th CJ (subject to narrow exceptions, “the Prohibition Zone boundary may not be expanded unless the moving Party demonstrates by clear and convincing evidence that there are compelling reasons that the proposed expansion is needed to prevent an unacceptable risk to human health.”).

With that as a backdrop, Gelman has proposed a large expansion of the Prohibition Zone, ostensibly due to the reduction in the drinking water standard from 85 to 7.2 ppb. Intervenors agree that a limited expansion is appropriate because 1,4-dioxane at concentrations above 7.2 ppb already has migrated beyond the existing boundary. Int Exp Rep, 10. In particular, Intervenors accept the entirety of the proposed expansion in the north. *Id.* But the size of the proposed expansion in the south is not scientifically justified.

As Intervenors' experts explain, a more limited expansion in the south is justified by the fairly steep concentration gradient in that area, meaning that the concentration falls off quickly as one moves toward the edge of the plume. *Id.*, 10, fn. 2. This suggests that a buffer of at most 400 feet in the southern area is appropriate to address the reduction of the drinking water standard, as described in Figure 4 of the Intervenors' experts' report.<sup>15</sup>

Gelman may argue that an additional buffer is appropriate because of the uncertainty over the migration of 1,4-dioxane and because a larger buffer is more protective of public health. Such arguments should be rejected. Gelman should not be permitted to use the uncertainty caused by its failure to delineate and properly model the future migration of the plume as a basis for a larger Prohibition Zone. See, MCL 324.20114(1)(a) (requiring a liable party like Gelman to "determine the nature and extent of the release at the facility."). The starting point should be maintenance of the existing Prohibition Zone. Only credible technical data should be sufficient to support an expansion. Gelman has not come forward with credible data for a larger southern expansion. As for protecting public health, one always could argue that a greater Prohibition Zone provides greater protection. That argument has no limiting factor, yet expansion of the

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<sup>15</sup> If the Intervenors' proposal for the southern Prohibition Zone boundary is accepted, then the proposed new boundary well at location E should be adjusted accordingly, as reflected on Figure 4 of the Intervenor Expert Report.

Prohibition Zone comes with a steep price—interference with property rights and the contamination of additional natural resources.

The benefits of an increased Prohibition Zone expansion in reality would flow to Gelman. The larger the Prohibition Zone, the less active remediation Gelman need perform in order to maintain the integrity of the boundary. Gelman also surely knows that it will be very difficult to expand the Prohibition Zone in the future given the high standards in the Current Court Orders and Proposed 4th CJ and wants as much cushion as it can obtain. But the standard Gelman must meet for a future expansion is high for a reason. The Prohibition Zone is not a mechanism that exists for Gelman’s convenience and it comes with significant cost. The Court should adopt the Intervenor’s proposed expansion as set forth in Figure 4 to their experts’ report because any expansion beyond that is unsupported by data and is not necessary to protect public health.

**C. The increased *Active Remedial Measures Proposed in the Proposed 4th CJ Are Necessary.***

The Current Court Orders do not have sufficient *active* remedial measures in place to achieve the intended remedial objectives when the new, more stringent cleanup criteria (7.2 ppb drinking water and 280 ppb GSI) are applied. First, the PZ was designed to prohibit wells in areas where the residential drinking water cleanup criterion (then 85 ppb) has been or might be exceeded. But the south boundary of the current PZ already has been breached by 1,4-dioxane exceeding the new residential drinking water cleanup criterion of 7.2 ppb. Similarly, the Maple Road Containment Objective was established to prohibit groundwater exceeding the GSI value (then 2,800 ppb) from migrating past Maple Road. A number of extraction wells were required by the Current Court Orders at and upgradient of Maple Road to achieve that objective. Again, however, that line has been breached by groundwater with 1,4-dioxane exceeding the new GSI

value of 280 ppb. Third, private wells in Scio Township are at risk, with measurable 1,4-dioxane nearing the new 7.2 ppb drinking water level.

Scientifically, to achieve the above objectives now, when the new cleanup criteria are applied, requires both adjusted containment lines (e.g., new PZ boundaries and new downgradient GSI limits) and additional active remedial measures at the Gelman Property and at remaining hot spots to lower 1,4-dioxane concentrations moving downgradient. Accordingly, the Proposed 4<sup>th</sup> CJ requires that Gelman perform the following, necessary additional active remedial measures that are not required by the Current Court Orders: (1) install wells and extract, treat and dispose water from identified hot spot areas at the new “Rose Well”, at the new “Parklake Well” and at six or more locations on the Gelman Property; (2) install and operate a Heated Soil Vapor Extraction System (“HSVE System”) in the Burn Pit area on the Gelman Property; and (3) implement a Phytoremediation treatment system in two areas of the Gelman Property. Removing additional 1,4-dioxane mass from these hot spots will result in a significant reduction in the downgradient concentrations of 1,4-dioxane as the groundwater migrates past and beyond that area. This reduces the likelihood that, in the future, downgradient wells will exceed allowable limits, that the PZ boundaries will be breached, or that groundwater venting to surface waters will exceed the GSI limits. Int Exp Rept, p 25. Intervenors agree with these provisions and support their inclusion in the proposed 2021 Order, provided certain modifications are made.

**D. Treated Water From Parklake Well Should Be Piped To And Discharged From Gelman's Existing Outfall At The Gelman Property.**

**1. The Proposed 4th CJ plan to discharge treated Parklake water to First Sister Lake is not appropriate.**

As noted in prior sections of this brief, sections V.A.3.e – g of the Proposed 4th CJ (pp. 14-16) would require Gelman to install the Parklake Well in an identified hot spot, and extract, treat and dispose of the treated water. That active remedial action would be appropriate, effective and necessary to remove 1,4-dioxane mass and reduce the subsequent downgradient 1,4-dioxane concentrations in groundwater. This then reduces the likelihood that homeowners' wells would be contaminated, reduces the likelihood that the PZ boundaries would be breached and reduces the likelihood that the GSI criterion would be exceeded when the water vents to a surface water such as Allen Creek, Honey Creek or the Huron River.

However, section V.A.3.g. of the Proposed 4th CJ (p. 16) currently would require Gelman to install and operate this important Parklake hot spot treatment system *only if* Gelman is permitted to discharge 200 gallons per minute of the treated water year round into First Sister Lake. That discharge would have negative consequences. As examples, the discharge would raise the water level of First Sister Lake by about 6 – 12 inches (adversely affecting a raingarden recently installed by the City of Ann Arbor); the discharge of groundwater with a year round temperature of 55 degrees F will make the lake cooler in summer and warmer in winter (disturbing the habitat of plants and animals that depend on seasonal changes to water temperatures); the 200 gpm volume of water will turn over the entire lake water volume every 35 days (which could adversely impact fish and amphibious creatures and flora around the lake by changing temperature and chemistry of the water). Int Exp Rept, pp. 27-28. Gelman should not be allowed to discharge its treated water to First Sister Lake when such negative consequences are possible.



Gelman's obligation to implement this necessary and appropriate active Parklake Well extraction and treatment remedial measure should not and need not be conditioned on permitting a discharge to First Sister Lake. A pipeline can be installed in roadways from Parklake to the Gelman Property where this water can be discharged through Gelman's existing permitted outfall. The only downside to Gelman is the cost of the pipeline. That cost should be borne by the liable party. However, Intervenor believe the additional cost to install that pipeline, all of which could be in public rights-of-way, is relatively minimal, looking at the entirety of the remediation costs Gelman is incurring. In addition, the Intervenor are prepared to cooperate with Gelman regarding installation of the pipeline in public rights-of-way.

**2. Scientific Rationale for piping treated Parklake water to Gelman Property for discharge.**

There would be several environmentally harmful consequences if the treated Parklake well water is discharged into First Sister Lake. In contrast, those adverse consequences would be eliminated (and no significant additional adverse consequences to human health or the environment would result) if, instead, a pipeline is installed into road rights of way and that water is then piped to the Gelman Property where it would be discharged through Gelman's current outfall into the Honey Creek tributary. As stated by the Intervenor experts:

Although 200 gpm may not sound like a large amount of water, over the course of a week or a month or a year it adds up to a considerable volume, and if the treated water from the Parklake Extraction Well were discharged into First Sister Lake, the impacts on First Sister Lake and the surrounding areas likely would preclude issuance of an NPDES<sup>16</sup> permit. To avoid a likely unsuccessful application for an NPDES permit, other options need to be considered and the effects of those options need to be fully assessed.

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<sup>16</sup> NPDES is an acronym for National Pollutant Discharge Elimination System, a federal permitting program that has been delegated to the State of Michigan. Gelman would be required by federal and state law to obtain a NPDES permit prior to discharging to First Sister Lake.

Alternatives to direct discharge into First Sister Lake involve questions of engineering and access. Therefore, flexibility is warranted to enable Gelman and the affected communities to devise an acceptable solution while navigating the NPDES permitting process. Int Exp Rept, p 28.

The only downside to this approach would be the cost to Gelman to install the pipeline to transport its contaminated water. An alternative approach should be allowed only if Gelman satisfies EGLE (and this Court if a dispute resolution is required) that any different alternative it proposes will not have an adverse impact on human health or the environment.

**3. Proposed Provisions for Parklake treated water discharge in the 2021 Order.**

Intervenors propose that Section V. A. 3.g. (p. 16) of the Proposed 4th CJ be deleted in its entirety and replaced with the following provision in the 2021 Order **as shown in red**:

- g. Transport and discharge/disposal of treated Parklake Well water.**
  - i. Unless EGLE approves an alternative that satisfies g. ii, below, after groundwater extracted by the Parklake Well is properly treated with ozone/hydrogen peroxide technology, Gelman shall transport the treated water through a pipeline to the Gelman Property where it shall be discharged from Gelman’s existing permitted discharge outfall, in accordance with the terms of its existing permit (as same may be amended or replaced). Gelman shall obtain any permits or amendments to permits necessary to authorize such discharge. Gelman shall obtain all necessary permits or authorizations from all applicable state or local governmental authorities necessary to install, maintain and operate a pipeline to transport the treated water from the Parklake Well treatment system to the Gelman Property. Gelman shall install, maintain and operate the pipeline at its sole cost.**
  - ii. Subject to EGLE approval, Gelman may propose and implement alternative means or methods to discharge or dispose of water from the Parklake Well (following treatment with ozone/hydrogen peroxide technology), in lieu of the pipeline described in g.i., above. Such an alternative may be approved and permitted by EGLE, only if Gelman demonstrates that the alternative will have no adverse impacts or consequences to human health or the environment.**

**E. Concurrent Installation and Operation of the 6 Identified Extraction Well Locations on the Gelman Property.**

**1. The Need for More Extraction Wells in the Source Area.**

The highest concentrations of 1,4-dioxane remain on the Gelman property where the chemical was released into the soil and groundwater as part of the company's manufacturing process. The releases of 1,4-dioxane occurred through seepage lagoons, land spray irrigation and direct discharges to the environment. Concentrations of 1,4-dioxane in the source area have been as high as 225,000 ppb and still remain at levels in excess of 10,000 ppb in some areas. Those areas with the highest concentrations are identified in the Proposed 4th CJ as Former Ponds 1 and 2, Former Burn Pit and the Marshy Area. The existing contaminant levels greatly exceed the drinking water standard of 7.2 ppb and the GSI standard of 280 ppb.

As a liable party under Part 201, Gelman has 3 basic legal duties with respect to the releases of 1,4-dioxane at its facility: (i) Determine the nature and extent of the releases at the facility; (ii) Immediately stop and prevent an ongoing release at the source; and (iii) Diligently pursue response activities necessary to achieve the cleanup criteria established under Part 201. MCL 324.20114. While Gelman has certainly removed a considerable amount of 1,4-dioxane from the source area, it has failed to comply with its basic obligations to stop ongoing releases at the source and diligently pursue the response activities necessary to achieve applicable cleanup criteria. Gelman's failure to comply with Part 201 has resulted in a large plume of groundwater contamination migrating through the City of Ann Arbor which continues to be fed by high concentrations in the source area.

The Gelman property is located in the "Western Area" as identified in Section V.B. of the Proposed 4th CJ. There are two primary objectives in the Western Area which Gelman is required to meet. The first objective is that Gelman shall prevent the horizontal extent of

groundwater contamination from expanding, regardless of aquifer depth. The second objective is that Gelman shall prevent 1,4-dioxane from venting into surface waters in the Western Area at concentrations above the GSI criterion of 280 ppb (Proposed 4<sup>th</sup> CJ, pp. 30-32). The nearest surface water of most concern is the Honey Creek Tributary, located just north of the Marshy Area which has groundwater concentrations in excess of 10,000 ppb.

The more 1,4-dioxane that is removed from the source area, the more likely it is that Gelman will meet the objectives for the Western Area. The high concentrations in the source area exist largely in the shallow groundwater. These concentrations seep into the lower aquifers which then migrate off-site and continue to feed the Eastern Area plume. These concentrations also migrate laterally, which has the potential to expand groundwater contamination in the Western Area and vent into Honey Creek, Third Sister Lake and other nearby surface waters in excess of the GSI criterion. Removing as much 1,4-dioxane as possible from the source area is the best way to prevent continued vertical and lateral migration and satisfy the Western Area objectives. Int Exp Rept, p 29-30.

Acknowledging the importance of increased mass removal, Gelman agreed in the Proposed 4th CJ to install 3 additional extraction wells in the source area. Int Exp Rept, p, 29, fig. 18. These 3 proposed wells will collect groundwater at a combined rate of 75 gallons per minute (“gpm”) and the 1,4-dioxane will be removed at Gelman’s on-site treatment facilities. Based on the performance achieved from these 3 extraction wells, the Proposed 4th CJ provides that Gelman and EGLE will evaluate whether 3 additional extraction wells will be installed in the source area, which are identified in Attachment I to the Proposed 4th CJ. The criteria for evaluation is whether the 3 additional extraction wells “would accelerate mass removal to a degree that meaningfully benefits the remediation.” Proposed 4th CJ, pp. 46-47. There is no

question that 3 additional extraction wells will accelerate mass removal and therefore Intervenor request that the Proposed 4th CJ be modified to require that Gelman install and operate concurrently all 6 extraction wells identified in Attachment I to the Proposed 4<sup>th</sup> CJ. Based on the performance of these initial 6 wells, more extraction wells may be required in the Source Area.

## **2. Scientific Rationale for More Extraction Wells in the Source Area.**

The Marshy Area where the highest concentrations of 1,4-dioxane remain consists largely of peat soil, which is typical of wetland areas. The peat absorbs water and therefore the flow of groundwater in this area is more limited than in areas of more sandy soils. As a result of the poor hydraulic conductivity, extraction wells installed in or near the Marshy Area have a smaller radius of influence (i.e., the influence of pumping from these wells is significant over a relatively small area). This means that you need to install more extraction wells to achieve hydraulic control of the contaminated groundwater.

The Proposed 4<sup>th</sup> CJ requires the installation of 3 extraction wells in the northwestern, central and southwestern sections of the source area. Given the peat matrix and the poor hydraulic conductivity, it is unlikely that only 3 wells will be sufficient to reach all hot spots in the source area. The 3 “optional” extraction wells are designated to be installed in the northern, eastern and southeastern sections of the source area which would provide a more complete recovery system and make it more likely that the highest concentrations of 1,4-dioxane would be removed from the aquifer. Int Exp Rept, p.30.

Mass removal in the source area is directly related to Gelman’s obligation under Part 201 to prevent an ongoing release at the source. The installation of 3, rather than 6, extraction wells will likely result once again in Gelman failing to meet its Part 201 obligations. Only 3 extraction wells will leave large sections of the source area without any hydraulic control. This will in turn allow continued migration of 1,4-dioxane down to lower aquifers which flow off-site into the

City of Ann Arbor. The lack of hydraulic control will also allow lateral migration of contaminated groundwater which vents into the Honey Creek Tributary and other surface waters in the area. Lateral migration also presents a risk of contaminating residential wells located near the edge of the plume. Int Exp Rept, p 7.

All parties agree that more mass removal from the source area will benefit the overall remediation effort for the reasons discussed above. It is undisputed that more extraction wells will remove more 1,4-dioxane from the environment. Given that 6 extraction wells are already contemplated in the Proposed 4<sup>th</sup> CJ, it is a simple and highly effective modification to require the installation of the 3 “optional” wells so that all 6 extraction wells operate concurrently to maximize mass removal from the source area. Based on the performance of these initial 6 wells, more extraction wells may be required in the Source Area.

### **3. Proposed Provisions for More Extraction Wells to include in a 2021 Order.**

Intervenors propose that the 2021 Order contain the following Section VI. C. 1. (pp. 46-48) of the Proposed 4<sup>th</sup> CJ **modified as shown in red:**

1. Additional Groundwater Extraction. Defendant shall install and operate ~~three~~ **six** ~~“Phase I”~~ extraction wells (one of which was previously installed) at the general locations depicted in the attached Attachment I to enhance control and mass removal of 1,4-dioxane from this area of shallow groundwater contamination. Defendant shall operate these extraction wells at a combined purge rate of approximately ~~75~~ **150** gpm, subject to aquifer yield. Defendant shall have the discretion to adjust the individual well purge rates in order to optimize mass removal. Subject to Defendant’s ability to adjust individual well purge rates, Defendant shall continue to extract a combined purge rate of approximately ~~75~~ **150** gpm, subject to aquifer yield, . . .

Based on the performance achieved from ~~the above initial~~ **six** extraction wells, the Parties shall evaluate whether installation **and operation of up to three** additional extraction wells ~~at the general locations indicated on Attachment I~~ would accelerate mass removal to a degree that meaningfully benefits the Remediation. If EGLE determines that additional mass removal **of 1,4-dioxane from additional wells** would be beneficial, Defendant shall, subject to its right to invoke Dispute

Resolution under Section XVI, install and operate these additional wells pursuant to a work plan approved by EGLE.

Groundwater extracted from the extraction wells described in this subparagraph will be conveyed to the Wagner Road Treatment Facility for treatment and disposal pursuant to Defendant's NPDES Permit No. MI-0048453, as amended or re-issued.

**F. Termination Criteria For Extraction Wells Should Be Modified To Allow For Continued Operation After 1,4-Dioxane Concentrations are Reduced Below 500 PPB.**

**1. The Need for Modification of the Termination Criteria for Extraction Wells.**

The Proposed 4<sup>th</sup> CJ includes several extraction wells in different locations which are intended to target the highest concentrations of 1,4-dioxane in the area of the plume. The proposed extraction wells in the source area were discussed in the previous section. There is also an extraction well proposed in the Eastern Area near First Sister Lake called the "Parklake Well." Although the Parklake Well is located downgradient of the Gelman property, its objectives are similar to the extraction wells in the source area. It is located in a hot spot area and its primary purpose is mass removal to reduce the concentrations of 1,4-dioxane which are migrating toward Allen Creek and the Huron River.

Concentrations of 1,4-dioxane in the Parklake Well area substantially exceed the GSI criterion of 280 ppb. Given the rising concentrations in Allen Creek in the West Park area, it appears that contaminated groundwater which exceeds the GSI criterion may be venting into the Creek. Int Exp Rept, p 17. This underscores the importance of the Parklake Well, not only for mass removal but also for compliance with the GSI criterion.

The Proposed 4<sup>th</sup> CJ includes provisions for terminating the source area and Parklake extraction wells after 1,4-dioxane concentrations are reduced below 500 ppb. (Proposed 4<sup>th</sup> CJ, pp. 15-16, 41, 47.) This is a completely arbitrary threshold and should be eliminated from the

Proposed 4<sup>th</sup> CJ. Meaningful mass removal can still occur at lower concentrations and it would be irresponsible to shut these wells down until as much 1,4-dioxane as possible has been removed from the aquifers.

**2. Scientific Rationale for Modification of the Termination Criteria for Extraction Wells.**

The 500 ppb termination criterion would prevent the maximum removal of 1,4-dioxane from the aquifer and reduce the overall effectiveness of the remediation. Since mass removal can occur at lower concentrations, shutting down an extraction well prematurely simply means that less 1,4-dioxane is being removed from the environment. This makes it more likely that Gelman will not be able to meet the objectives of the Current Court Orders or its obligations under Part 201 of source control and compliance with GSI. In addition to mass removal, other benefits of continuing to operate the extractions wells at lower concentrations include hydraulic capture of contamination and prevention of 1,4-dioxane migration. Int Exp Rept, p 26.

Furthermore, Gelman recognizes the benefits of pumping at lower concentrations because it continues to operate extraction wells with concentrations well below 500 ppb. Int Exp Rept, p. 26, fig. 16. Gelman continues to operate TW-21 and TW-18, where concentrations are currently around 250 ppb. It also continued to operate TW-1, TW-6 and TW-12 until concentrations were in the 20-100 ppb range.

There is no numeric termination criteria in the Proposed 4th CJ for any of the extraction wells currently operated by Gelman. In the Eastern Area, Gelman must operate the wells until it can establish that it has met the Eastern Area Objectives of no contamination migrating beyond the boundaries of the Prohibition Zone and preventing 1,4-dioxane from venting to surface waters in the Eastern Area at concentrations above the GSI criterion in compliance with Part 201 (Proposed 4th CJ, p.8). In the Western Area, Gelman must operate the extraction wells until it



can establish that extraction is no longer necessary to prevent expansion of the contamination and to satisfy the GSI criterion (Proposed 4th CJ, pp.30-32).

It would be irresponsible to apply an arbitrary numeric termination criterion for the proposed source area and Parklake extraction wells. It would mean less 1,4-dioxane removed from the environment. It would also be inconsistent with the existing termination criterion that bases termination or reduction in pumping rates on whether objectives in the Current Court Orders have been met.

The termination criterion of 500 ppb is also inappropriate given the nature of how extraction wells operate. Extraction wells are much different from monitoring wells, which passively sample concentrations in the surrounding groundwater. Extraction wells draw water equally in all directions from the groundwater that surrounds them Int Exp Rept, p. 27, fig. 17. Therefore, the concentration measured in an extraction well represents the average concentration of water which the well draws in from every direction. Actual concentrations in parts of the aquifer within the radius of influence of the well can be much greater than what is measured. Int Exp Rept, p 27.

For example, an extraction well placed near the edge of a hot spot could draw concentrations of over 1,000 ppb along with concentrations below 100 ppb. While the concentration in this well could be measured at 500 ppb, much higher concentrations would be present within the radius of influence of the well. This would mean concentrations of over 1,000 ppb would continue to be removed, even though the composite concentration of the 1,4-dioxane measured in the extraction well is lower. There is no scientific basis to terminate an extraction well such as this while it is still removing concentrations of over 1,000 ppb. Since it is virtually

impossible to place every extraction well in the exact center of a hot spot, this phenomenon is likely to occur to varying degrees with every extraction well. Int Exp Rept, p. 27.

For these reasons the Intervenor propose a modification to the Proposed 4th CJ with more flexible termination criteria. Similar to the existing criteria, Intervenor request that Gelman be required to operate the Parklake and source area extraction wells until it can be established that a well no longer contributes to the beneficial reduction in 1,4-dioxane mass. This would maximize mass removal and include the accompanying benefits of both source control and more limited migration.

### **3. Proposed Provisions for Modification of Termination Criteria for Extraction Wells to Be Included in the 2021 Order.**

Intervenor propose that the 2021 Order contain the following Section V.A.f.ii of the Proposed 4<sup>th</sup> CJ (pp. 15-16) **modified as shown in red**:

- ii. Defendant shall operate the Parklake Well, at a purge rate of approximately 200 gpm, subject to the yield of the aquifer in that area and discharge volume restrictions imposed in connection with the method of water disposal including discharge restrictions during wet weather events, in order to reduce the mass of 1,4-dioxane migrating from that area. Purged groundwater from the Parklake Well shall be treated with ozone/hydrogen peroxide or ultraviolet light and oxidizing agents at the City of Ann Arbor-owned parcel. Defendant shall operate this extraction and treatment system until ~~the 1,4-dioxane concentration in the groundwater extracted from the Parklake Well has been reduced below 500 ug/L. Once concentrations have been reduced below 500 ug/L~~ effluent 1,4-dioxane concentrations indicate continued extraction will no longer contribute to beneficial reduction in 1,4-dioxane mass.” Before seeking to terminate or significantly reduce extraction, Defendant shall cycle the Parklake Well off and on for several periods of time approved by EGLE to demonstrate that significant concentration rebound is not occurring. Defendant shall not permanently terminate extraction and treatment of water from the Parklake Well before the second anniversary of the date extraction was commenced. Before significantly reducing or terminating extraction from the Parklake Well (beyond the discharge volume restrictions/variations arising from the approved discharge option/above-described cycling), Defendant shall consult with EGLE and provide a written analysis, together with the data that supports its conclusion that the foregoing conditions have been satisfied. EGLE will review the analysis and data and provide a written response to Defendant within 56 days after receiving Defendant’s written analysis and data. If Defendant disagrees with EGLE’s

conclusion, Defendant may initiate dispute resolution under Section XVI of this Consent Judgment. The Defendant shall not significantly reduce or terminate extraction from the Parklake Well during the 56-day review period or while Defendant is disputing EGLE's conclusion.

Intervenors propose that the 2021 Order contain the following Section VI.C.1. of the Proposed 4<sup>th</sup> CJ (pp. 46-48) be **modified as shown in red**:

1. Additional Groundwater Extraction. . . . Defendant shall continue to extract a combined purge rate of approximately ~~75~~ 150 gpm, subject to aquifer yield, from this system until ~~the 1,4-dioxane concentration in the groundwater extracted from each of these extraction wells has been reduced below 500 ug/L and, once the concentrations in all three of the wells have been reduced below 500 ug/L~~ effluent 1,4-dioxane concentrations from each of these extraction wells indicate continued extraction will no longer contribute to the beneficial reduction in 1,4-dioxane mass and, once this has occurred for all six of the wells, Defendant shall cycle those wells off and on for several periods of time approved by EGLE to demonstrate that significant concentration rebound is not occurring. Before otherwise significantly reducing or terminating extraction from this system, Defendant shall consult with EGLE and provide a written analysis, together with the data that supports its conclusion that ~~the concentration of 1,4-dioxane in the groundwater extracted from each of these wells has been reduced L below 500 ug/~~ continued extraction will no longer contribute to the beneficial reduction in 1,4-dioxane mass, as stated above. EGLE will review the analysis and data and provide a written response to Defendants within 56 days after receiving Defendant's written analysis and data. If Defendant disagrees with EGLE's conclusion, Defendant may initiate dispute resolution under Section XVI of this Consent Judgment. The Defendant shall not significantly reduce or terminate the extraction from this system during the 56-day review period or while Defendant is disputing EGLE's conclusion. . . .

**G. The Trigger For Response Activities In The Western Area Compliance Wells Should Be Reduced From 7.2PB TO 3.5 PPB.**

**1. The Need for a Lower Trigger in Western Area Compliance Wells.**

The Proposed 4th CJ requires Gelman to install 6 new delineation wells in the Western Area. These are monitoring wells that will be installed as part of Western Area Delineation Investigation and are identified as locations I, J, K, L, M and N on the site map attached as Attachment G to the Proposed 4th CJ. These wells will be part of a network of Compliance Wells which will be sampled quarterly and used to determine whether Gelman is in compliance with the objective of no expansion of groundwater contamination in the Western Area.

The 6 new delineation wells play a vital role in protecting the public from exposure to 1,4-dioxane in their drinking water. The proposed wells are located between the northern edge of the contaminant plume in the Western Area and hundreds of residential drinking water wells located within the potential migration pathway. In fact, regular sampling of residential wells in this area has revealed low levels of 1,4-dioxane already present in wells on Elizabeth Road and Breezewood Court, located just north of the proposed delineation wells. **Ex. N, Residential Well Sampling.**

The Proposed 4th CJ requires Gelman to sample the Compliance Wells on a quarterly basis. If 1,4-dioxane is detected in any Well above 7.2 ppb, this is considered to be a “Verified Compliance Well Exceedance” and Gelman will increase the sampling to monthly. In the event of an Exceedance in two successive monthly samples, then Gelman is required to undertake a series of response activities, including increased residential well sampling, a hydrogeological investigation and a feasibility study of interim measures to control expansion of the plume such as installation of additional extraction wells (Proposed 4th CJ, pp. 36-40).

Given the critical role of the Compliance Wells in protecting public health, Intervenors request that the trigger level for response activities be reduced from 7.2 ppb to 3.5 ppb. The Compliance Wells are the “last line of defense” to prevent the contamination of residential drinking water supplies. Response activities to avoid this disastrous result will be more effective if undertaken before contaminant levels exceed the drinking water standard.

It creates an unnecessary public health risk to “wait” for 1,4-dioxane concentrations in the Compliance Wells to exceed the drinking water standard before taking response activities to protect the drinking water supply. Waiting will only increase the likelihood of widespread residential well contamination due to the failure to implement corrective measures early enough in the process to control migration of the plume.

**2. Scientific Rationale for a Lower Trigger in Western Area Compliance Wells.**

The Compliance Wells are there to detect any expansion of the contaminant plume in the Western Area. A reading all the way up to 7.2 ppb is not necessary to detect that expansion is occurring. Any increase in concentrations are an indication that levels of 1,4-dioxane at 7.2 ppb and higher are moving outward toward the Compliance Well. It is simply not possible for concentrations in the Compliance Well to rise from non-detect to 7.2 ppb or lower without the position of the 7.2 ppb concentration line moving toward the Compliance Well. Any detection of 1,4-dioxane in a Compliance Well is a *de facto* expansion of the horizontal extent of the groundwater contamination. Int Exp Rept, p. 35-36.

Intervenors request a trigger level of 3.5 ppb, which represents the US EPA Drinking Water Concentration for a cancer risk level of 1 in 100,000. This level is sufficiently above the 1 ppb detection limit so that there should not be any concerns about statistical variability or false positives. Furthermore, in the Proposed 4th CJ Gelman has already agreed to a trigger level of

4.6 ppb for wells on the boundary of the Prohibition Zone. 3.5 ppb is a reasonable and workable trigger level which is more likely to prevent expansion in the Western Area and contamination of residential drinking water supplies.

**3. Proposed Provisions for a Lower Trigger for Western Area Compliance Wells to Include in a Supplemental Response Activity Order.**

Intervenors propose that the 2021 Order contain the following Section V.B.4.b. of the Proposed 4th CJ (pp. 36-38) **modified as shown in red**:

b. Verification Process. Defendant shall conduct the Verification Process as defined in Section III.X for each Compliance Well to verify any exceedance of ~~7.2~~ 3.5 ppb. A verified detection above ~~7.2~~ 3.5 ppb will be considered a “Verified Compliance Well Exceedance.” If a second sample does not exceed ~~7.2~~ 3.5 ppb, monitoring of the well will increase to monthly until the pattern of exceedances is broken by two successive sampling events below ~~7.2~~ 3.5 ppb. At that point, a quarterly monitoring frequency will resume.

Intervenors propose that Section V.B.4.c(i) of the Proposed 4th CJ be modified as follows:

c. Response Activities. In the event of a Verified Compliance Well Exceedance, Defendant shall take the following Response Activities: i. Sample selected nearby private drinking water wells. Defendant shall sample select private drinking water wells unless otherwise the Parties otherwise agree. Prior to sampling the selected wells, Defendant shall submit a list of the wells to be sampled and other sampling details to EGLE for approval. In selecting wells to be sampled, Defendant shall consider data collected from monitoring and private drinking water wells within 1,000 feet of the Compliance Well(s) that exceeded ~~7.2~~ 3.5 ppb, groundwater flow, hydrogeology and well depth. EGLE shall respond within seven days after receipt of Defendant’s list of select private drinking water wells and shall either approve the list or propose alternate or additional wells to be sampled.

Intervenors propose that Section V.B.4.c.(ii)(D) of the Proposed 4th CJ be modified as follows:

ii. If a Verified Compliance Well Exceedance occurs in the same Compliance Well in any two successive monthly sampling events, Defendant shall take the following Response Activities:

(D) Interim Measures Feasibility Study. During the eight month period after the second consecutive Verified Compliance Well Exceedance, Defendant shall evaluate affirmative measures to control expansion of the Groundwater Contamination as necessary to reduce the concentration of 1,4-dioxane in the relevant Compliance Well to below ~~7.2~~ 3.5 ppb, including adjustments in groundwater extraction rates, the installation of additional groundwater extraction wells or other remedial technologies. 38 Defendant shall submit to EGLE a feasibility study within 240 days of the Verified Compliance Well Exceedance. The feasibility study shall include an evaluation of the feasibility and effectiveness of all applicable measures to control expansion of the Groundwater Contamination as necessary to reduce the concentration of 1,4-dioxane in the relevant Compliance Well to below ~~7.2~~ 3.5 ppb in light of the geology and current understanding of the fate and transport of the Groundwater Contamination.

**H. Gelman Should Be Required to Develop a Plan Which Monitors the Effectiveness of the Phytoremediation Systems.**

**1. The Need for Monitoring the Effectiveness of the Phytoremediation Systems.**

Phytoremediation is a remediation technology which uses living plants to remove or immobilize contaminants in soil and groundwater. The root systems can remove contaminants from the groundwater through transpiration and can also dewater a shallow aquifer to prevent contaminants in the soil from migrating to lower aquifers. The Proposed 4th CJ (pp. 48-49) requires Gelman to install two tree systems in the source area to accomplish both of these objectives.

In the former Ponds 1 and 2 Area phytoremediation will consist of poplar and hardwood trees planted primarily to withdraw shallow groundwater and capture precipitation near the ground surface before it infiltrates beyond the root systems. Int Exp Rept, p. 30-31. If the trees

are successful in dewatering the shallow aquifer, contaminants in the soil will be less likely to move to lower aquifers and migrate off site. Trees planted in the Ponds I and II Area are also expected to remove some amount of 1,4-dioxane from the shallow soil and groundwater through transpiration and biodegradation. *Id.*

Similarly, in the Marshy Area phytoremediation will consist of willow trees which will capture contaminated groundwater and infiltration water moving through the contaminated soil before it can move vertically and migrate off site. *Id.* p 31. The Marshy Area is located near the Honey Creek Tributary and the trees also serve the purpose of preventing lateral migration of contaminated water and possible venting to the Creek in violation of the GSI criterion. It is also expected that the trees in the Marshy Area will remove 1,4-dioxane from the soil and groundwater through transpiration and biodegradation. *Id.*

Phytoremediation is a promising but experimental technology so it is uncertain how effective it will be in removing and containing 1,4-dioxane in the source area or how best to measure its effectiveness. Yet the Proposed 4th CJ lacks any requirement for Gelman to measure or monitor the effectiveness of the phytoremediation systems. The Proposed 4th CJ vaguely states that Gelman will operate the systems until it determines that phytoremediation is no longer necessary to meet the objective of preventing the migration of 1,4-dioxane from contaminated soils into any aquifer at concentrations which would cause non-compliance with the Western Area Objectives of no expansion and no venting to surface water in violation of the GSI criterion (Proposed 4th CJ, pp. 48-49). But it is not possible to determine whether objectives are being met unless there is a plan to verify the effectiveness of the phytoremediation systems with objective data.



Therefore, the Intervenors request a modification to the Proposed 4th CJ to require Gelman to develop a phytoremediation effectiveness verification plan. Such a plan would generate the following types of data: 1) Measuring concentrations of 1,4-dioxane in groundwater beneath and downgradient from the tree plots; 2) Measuring changes in the groundwater table due to the presence of the trees; 3) Measuring the rate of transpiration; 4) Analysis of tree tissue or leaves for levels of 1,4-dioxane; and 5) Shallow groundwater monitoring points along the Honey Creek Tributary to measure GSI compliance. This data will provide the basis for an objective evaluation of the effectiveness of the phytoremediation systems.

## **2. Scientific Rationale for Monitoring the Effectiveness of the Phytoremediation Systems.**

Trees that are planted as part of the phytoremediation systems likely will not have a significant effect on site hydrogeology and 1,4-dioxane concentrations until 2-3 years after planting. Once the root systems are established, it is expected that dewatering and removal of 1,4-dioxane through biological processes will continue at optimal rates for many years. However, given the uncertainty of the technology and the complex hydrogeology of the source area, it is necessary to collect data to determine the effectiveness of the systems in meeting the non-expansion and GSI objectives in the Western Area. Int Exp Rept, p. 31.

The tree plots will be connected to the groundwater system in two important ways. First, root systems in the Ponds I/II Area will extend to the shallow groundwater unit primarily for the purpose of dewatering and capturing precipitation near the ground surface before it can infiltrate to lower aquifers. Second, the root systems in the Marshy Area extend to a deeper groundwater unit primarily for the purpose of capturing contaminated groundwater before it can migrate laterally to the Honey Creek Tributary or infiltrate a lower aquifer and migrate off site. Int Exp Rept, p. 31.

Because of these organic connections to the groundwater system, the tree plots will play an important role as to whether Gelman can maintain compliance with the Western Area Objectives. Monitoring beneath and adjacent to the tree plots and along the Honey Creek Tributary is essential in determining their effectiveness in preventing the expansion of groundwater contamination and venting into the Tributary. Ideally tree tissue or leaf analysis can be used to identify the location of the highest concentrations of 1,4-dioxane in the northernmost trees which will help determine appropriate locations for groundwater monitoring points adjacent to the tributary to Honey Creek. These points will be used to verify compliance with the GSI criterion.

**3. Proposed Provisions for Monitoring the Effectiveness of the Phytoremediation Systems to Include in a Supplemental Response Activity Order.**

Intervenors propose that the 2021 Order contain the following Section VI.B.3 (p. 46) in addition to what was in the Proposed 4th CJ:

3. Within 180 days of entry of this Order, Gelman shall submit to EGLE for its review and approval a plan to verify the effectiveness of the phytoremediation installations. At a minimum, the plan shall include: (i) procedures to determine or reliably estimate rates of biodegradation and transpiration for 1,4-dioxane in both the Former Pond and Marshy Areas; (ii) measurement of 1,4-dioxane concentrations in groundwater beneath the Former Pond and Marshy Areas; (iii) groundwater logging throughout the tree plots to verify expected dewatering; (iv) verification of the extent to which trees planted in caissons have root systems that penetrate lower aquifers containing high concentrations of 1,4-dioxane; (v) a modeled estimate of the impact of the tree plots on the availability and migration of 1,4-dioxane from the phytoremediation areas; (vi) an evaluation of the 1,4-dioxane content of the trees for categorization purposes once disposal becomes necessary, (vii) monitoring points along the Honey Creek Tributary to determine compliance with the GSI criterion, and (viii) any additional monitoring criteria Gelman and EGLE deem appropriate.

**I. The Heated Soil Vapor Extraction System Can Be Enhanced to Maximize Efficiency and Mass Removal.**

**1. The Need for Enhancement of the Heated Soil Vapor Extraction System.**

The Proposed 4th CJ requires Gelman to install a Heated Soil Vapor Extraction System (“HSVE System”) in the Burn Pit area on the Gelman property. This is an area with high concentrations of 1,4-dioxane in the soil and the purpose of the HSVE System is to remove contaminants from the unsaturated soil. Removal of contaminants in the soil will reduce the contaminant levels in groundwater as it moves vertically through the soil and migrates off site. This in turn will increase the likelihood of Gelman compliance with its Part 201 obligation to control ongoing releases at the source.

The HSVE System involves blowing heated air into subsurface soils through various injection points in the Burn Pit area. The heated air traverses horizontally and vertically through the subsurface soils and volatilizes the 1,4-dioxane into a vapor which is removed by a system of vacuum extraction wells. These extraction wells create a negative pressure in the unsaturated soils which controls subsurface vapor plume migration. The vapor which is extracted from the subsurface is exhausted into the air and may need to be treated depending on contaminant concentrations.

The Proposed 4th CJ provides that Gelman shall operate the HSVE System until concentrations in the exhaust have been reduced to levels which indicate that continued operation of the System will no longer contribute to meaningful reduction of 1,4-dioxane mass or the soil contamination is reduced below 500 ppb, whichever occurs first. (Proposed 4th CJ p.50). When operation of the HSVE System is terminated, Gelman is required to install an impervious cap over the treatment area to limit the infiltration of water into deeper soils and prevent any remaining 1,4-dioxane in the soil from migrating to groundwater or surface water.

The Intervenors are in agreement that the HSVE System is an appropriate method for removing 1,4-dioxane from soils in the Burn Pit area. However, Intervenors believe that the System can be more effective with two minor modifications. First, the impervious cap should be installed before the HSVE System begins to operate as this will limit infiltration of water and surface air and result in more effective subsurface treatment. Second, once the HSVE System appears to have reached an asymptotic removal rate, the System should be cycled off and on for several periods before shutting it down. This will ensure that the System is not shut down before it has achieved maximum mass removal of 1,4-dioxane from the soils. Int Exp Rept, p. 32-33. The Proposed 4th CJ requires Gelman to cycle the Parklake and source area extraction wells off and on before shutting them down and the same principles apply to the HSVE System.

**2. Scientific Rationale for Enhancement of Heated Soil Vapor Extraction System.**

The purpose of the HSVE System is to remove vapors with contaminants which have been volatilized and separated from the soil by heated air injected into the subsurface. The removal occurs due to the negative pressure created by the extraction wells which draws the vapors into the well. For the system to work at maximum efficiency, extraction wells should be pulling in only contaminated vapors. However, this negative pressure also results in ambient air near the ground surface being drawn into the HSVE System, which limits its effectiveness. The clean air in the System reduces the area of influence of each extraction well which means there are fewer air pore volume exchanges occurring and less contaminated vapors being removed from the soil. Furthermore, heat in the system is also lost due to infiltration of water and surface air, which reduces the effectiveness of the system.

The simple solution is to install an impervious cap on the surface before starting the HSVE System. This will limit infiltration of water and surface air and result in a more effective subsurface treatment. Gelman has already agreed in the Proposed 4th CJ to install an impervious barrier over the treatment area, but only after the HSVE System is shut down. Making the barrier part of the initial installation is easy to do and will significantly enhance the effectiveness of the HSVE System. Int Exp Rept, p. 34.

Typically, HSVE systems exhibit a diminished rate of contaminant extraction over time and it is expected that mass removal rates of 1,4-dioxane will plateau within several years. The Proposed 4th CJ states that Gelman will operate the HSVE System until levels of 1,4-dioxane in the exhausted discharge air have been reduced to levels such that the continued operation of the System will no longer result in meaningful mass reduction or soil contamination is reduced below 500 ppb, whichever occurs first (Proposed 4th CJ p. 50). At that point, Gelman is required to submit a written request to EGLE to reduce or terminate the operation of the HSVE System. The Intervenors simply request that Gelman be required to cycle the System off and on for several periods once an asymptotic removal rate has been achieved to ensure that a diminished extraction rate of 1,4-dioxane is not a temporary phenomenon. Gelman is already required by the Proposed 4th CJ to cycle the source area and Parklake extraction wells to ensure maximum mass removal, and it would be irresponsible not to impose the same requirement for the HSVE System.

**3. Proposed Provisions for Enhancement of Heated Soil Vapor Extraction System to Include in Supplemental Response Activity Order.**

Intervenors propose that the 2021 Order should contain the language from Section VI.C.4. of the Proposed 4th CJ (pp. 49-51), modified as follows [with **proposed modifications in red**]:

4. Former Burn Pit Area. Defendant shall undertake the following Response Activities with respect to the former Burn Pit area depicted on Attachments I and J: a. Install, operate, and maintain a Heated Soil Vapor Extraction System (“HSVE System”). The HSVE System shall be designed to reduce the mass of 1,4-dioxane present in the soils in the portion of the former Burn Pit area identified as “Heated Soil Vapor Extraction” on Attachment J. Defendant shall operate the HSVE system until 1,4-dioxane concentrations in the HSVE System’s effluent/exhaust has been reduced to levels that indicate that continued operation of the HVSE system will no longer contribute to meaningful reduction of 1,4-dioxane mass in the Former Burn Pit Area Soils or the Soil Contamination in the treatment area is eliminated, whichever occurs first. **Defendant shall cycle the HSVE System off and on for several periods of time approved by EGLE to demonstrate that significant concentration rebound is not occurring.** Before significantly reducing or terminating operation of the HSVE system, Defendant shall consult with EGLE and provide a written analysis, together with the data that supports its conclusion, that one or both of the above conditions has been satisfied. EGLE will review the analysis and data and provide a written response to Defendant within 56 days after receiving Defendant’s written analysis and data. If Defendant disagrees with EGLE’s conclusion, Defendant may initiate dispute resolution under Section XVI of this Consent Judgment. The Defendant shall not significantly reduce or terminate operation of the HSVE system during the 56-day review period or while Defendant is disputing EGLE’s conclusion.

~~Following completion of the HSVE treatment~~ As part of the installation of the **HSVE System**, Defendant shall install an impervious barrier over the HSVE Treatment Area to **limit infiltration of surface air and** inhibit water from percolating through the soils in the former Burn Pit Area.; ~~except with regard to any areas where Defendant can demonstrate to EGLE’s satisfaction that Soil Contamination does not exist.~~ Defendant shall maintain the impervious barrier in place until Soil Contamination is no longer present in the underlying soils.

b. Cap the portion of the former Burn Pit area identified as “Capped Area” on Attachment J with an impervious barrier to inhibit water from percolating through the 51 soils in the former Burn Pit area. Defendant shall maintain the impervious barrier in place until Soil Contamination is no longer present in the underlying soils.

5. After completing installation of the Response Activity systems listed in Sections VI.C.2, VI.C.3 and VI.C.4, the Defendant shall submit a separate installation report (i.e., as-built report) for each of the systems. The reports shall describe the systems as installed including, but not limited to, components of a system, location of components within the specific areas, depths of components of a system, and operational specifications of components of a system.

**J. Surface Water Bodies and Drainage Systems Should Be Sampled Annually**

**1. Annual sampling of surface water bodies and drainage systems is necessary to detect changes indicating venting of groundwater with 1,4-dioxane at new locations or rising concentrations.**

One of the primary objectives of the Proposed 4th CJ is to prevent 1,4-dioxane from venting into surface waters at concentrations above the Generic GSI Cleanup Criterion, except in compliance with Part 201, in order to ensure public and environmental health and safety. However, the presence of 1,4-dioxane has already been documented in Allen Creek, Third Sister Lake, and at multiple locations along the unnamed tributary to Honey Creek, posing a potential violation of this objective.

In order to ensure early detection of such potential violations of this objective, routine and regular surface water sampling is necessary to detect changes in concentrations that could indicate the venting of groundwater containing 1,4-dioxane at new locations or rising concentrations, and to ensure that appropriate response actions are taken in a timely manner. The Intervenor propose requiring sampling of surface water bodies and drainage systems following protocols developed by EGLE as implemented in 2019 and 2020 sampling.

**2. Detection will trigger investigation to determine risk of exceeding the GSI criterion.**

1,4-dioxane poses a serious threat to the surface waters of the Huron River watershed because it does not easily biodegrade and thus can remain in the water column at persistent concentrations for a relatively long time. There is currently no measure in place to detect 1,4-dioxane in the surface waters of the Huron River watershed through sampling and analysis, and

the current monitoring well scheme alone is insufficient to accurately assess the risk of 1,4-dioxane entering these surface waters through contaminated groundwater. Surface water monitoring is an effective way “to detect discharge of contaminated groundwater and trigger additional subsequent actions required to address whether that discharge represents an exceedance of the GSI criterion.” Int Exp Rept, p 35.

**3. Proposed provisions for surface water sampling to be included in the 2021 order.**

Intervenors propose that the 2021 Order should contain a new section V.A.11 with the following language [new provisions in red]:

Defendant shall sample annually: Allen Creek, the Allen Creek Drain, and each of its tributaries including the Main, North, South, and Murray Washington branches, as well as the outflow into the Huron River below Argo Dam; First Sister Lake; Second Sister Lake; Third Sister Lake; West Park Pond; Arbor Landing Pond; Smith Ponds; Little Lake; and Honey Creek and its tributaries. This sampling must be conducted under low flow conditions during the months of August, September, or October, following protocols developed by EGLE as implemented in 2019 and 2020 sampling.

Intervenors propose that the 2021 Order should contain a new section V.A.6.g. with the following language [new provisions in red]:

g. Exceedance of GSI Criteria in Surface Water. Pursuant to V.A.11., if sampling of any of the surface water bodies or drainage systems (with the exception of Third Sister Lake and the South Branch of the Allen Creek Drain downgradient of Maryfield-Wildwood Park) detects the presence of 1,4-dioxane at a concentration greater than 7 ppb, then, within 60 days of receiving such a sampling result, Defendant shall investigate and submit a report to EGLE containing at least the following information: (1) a determination of where and how 1,4-dioxane is likely entering the affected water body, (2) an assessment of the risk that the GSI Cleanup Criterion will be exceeded in the affected water body, (3) proposed Response Activities for preventing 1,4-dioxane from entering the affected water body in a concentration greater than the GSI Cleanup Criterion, and (4) an assessment of the risk that 1,4-dioxane from the affected water body could migrate to groundwater. After receipt and review of Defendant’s report, EGLE may require Defendant to undertake additional Response Activities to address the sampling result, including, but not limited to, the installation of additional monitoring wells.



**K. Gelman Should Publicly Disclose All Information Related to its Remedial Activities.**

**1. The need for public disclosure.**

Gelman's remedial activities conducted over the course of more than 30 years have necessarily generated a tremendous amount of environmental data and analysis. This would include such information as soil and groundwater sampling, pump tests and capture zone analysis for extraction wells, pilot tests for remedial actions, groundwater flow analysis and plume delineation. Yet it appears that only some of this information has been disclosed to the public. The massive plume of groundwater contamination affects significant populations in Scio Township and Ann Arbor and the public has a right to receive all data and other information related in any way to the remedial actions conducted by Gelman. Furthermore, this information would allow Intervenors and their experts to provide more detailed and constructive input as additional remedial actions are developed at the site.

The Proposed 4th CJ only requires that Gelman submit to EGLE quarterly progress reports which describe activities for the previous 3 months and provide sampling data (Proposed 4th CJ, pp. 56-57). These reports are mostly just raw analytical data from monitoring wells and effluent samples. There are no accompanying reports which analyze and interpret the data and put it into the context of the overall remedial objectives. Furthermore, there is not one common database from which this analytical data can be equally accessed by everyone. Gelman provides the data to EGLE, but it is not in a commonly readable electronic format and so EGLE has to first collate the data and then post it on the EGLE website. This inefficient process has long been a source of frustration for residents impacted by the plume because it has resulted in many discrepancies in the data and delays in disseminating information to the public. The simple

solution is for Gelman to establish a single cloud-based database which would include all historical and future analytical data and reports related to the Site.

EGLE has authority under Part 201 (MCL 324.20117) to demand that Gelman provide all information related to the contaminant plume and in fact this statutory authority is already embodied in the Proposed 4th CJ. Section XXII of the Proposed 4th CJ states that, upon request from EGLE, Gelman shall provide copies of all documents and information “relating to activities at the Site or to the implementation of this Consent Judgment” (Proposed 4th CJ, pp. 73-74). Unfortunately, EGLE does not exercise its statutory right on a regular basis and as a result for years the public has been denied access to important information about the nature and extent of the 1,4-dioxane contamination.

A good example of EGLE’s failure to request information is the proposed remedial activity in the source area. The Proposed 4th CJ provides that Gelman will install additional extraction wells, install a phytoremediation system and remove soil contamination through heated soil vapor extraction. The Proposed 4th CJ also requires Gelman to provide “as built” installation reports describing the components of each of the source control systems. (Proposed 4th CJ, p. 51). However, selection of these remedial actions would necessarily be based on a considerable amount of data and analysis, none of which has been requested by EGLE or disclosed to the public. For example, these systems are designed to address “hot spots” in the source area. But in order to locate the “hot spots,” extensive soil and groundwater sampling and sample analysis in the source area is required. Furthermore, in order to determine placement of extraction wells, typically pump tests are performed to determine the likely capture zones of the wells. Before designing a soil vapor extraction system, it is typically necessary to first run a pilot test to determine the effectiveness of a proposed system. None of this data or analysis has been

provided to the public, which is certainly entitled to such basic information as the current levels of soil and groundwater contamination in the source area.

The public should not have to rely on EGLE to exercise its statutory right in order to obtain technical analyses and environmental studies or reports related to the Site. Instead, Intervenors propose a revision to the Proposed 4th CJ which requires Gelman to provide this information to EGLE so that it can be posted on the EGLE website. Furthermore, Intervenors propose that Gelman provide all historical and future monthly analytical data simultaneously to EGLE and the public through a single cloud-based database. These actions would ensure complete transparency and equal access to information, and instill public confidence in the availability and reliability of the data.

## **2. The legal basis for public disclosure.**

Section 20117 of Part 201 provides that EGLE may require a responsible party to provide all information it has related to “the nature or extent of a release or threatened release at or from a facility.” MCL 324.20117(1)(b). For purposes of this section, “information” includes, but is not limited to, “documents, materials, records, photographs and videotapes.” MCL 324.20117(13). Information obtained by EGLE “shall be available to the public to the extent provided by the freedom of information act [FOIA] . . .” MCL 324.20117(910). In providing the information to EGLE, a responsible party may designate certain information which it believes is entitled to protection as trade secrets or if it is of a personal nature under FOIA. *Id.*

However, certain information is deemed so critical that Section 20117 requires its disclosure to the public regardless of how it may be designated by the responsible party. This information includes the following: 1) The potential routes of human exposure to the hazardous substance at the facility being investigated; 2) The location of disposal of any waste stream released from the facility; 3) Monitoring data or analysis of monitoring data pertaining to

disposal activities related to the facility; 4) Hydrogeologic data; 5) Groundwater monitoring data; and 6) The hazards to the public health, safety, or welfare, or the environment posed by the hazardous substance. MCL 324.20117(11).

Section 20117 recognizes the importance of the public having full access to information about hazardous contaminants which potentially impact the health and safety of their communities. Certainly, the plume of 1,4-dioxane contamination which stretches across a city and township has the potential to impact the health and safety of a large population and the public is entitled to access all information in Gelman's possession which relates to its release of 1,4-dioxane into the environment.

**3. Proposed provisions for public disclosure of information to include in a 2021 Order.**

Intervenors propose that Section XXII of the Proposed 4th CJ (pp. 73-74) be modified as follows [with original provisions in black and new provisions in red]:

**XXII. ACCESS TO INFORMATION**

**A.** Upon request, EGLE and Defendant shall provide to each other copies of or access to all non-privileged documents and information within their possession and/or control or that of their employees, contractors, agents, or representatives, relating to activities at the Site or to the implementation of this Consent Judgment, including, but not limited to, sampling, analysis, chain 74 of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information related to the Remedial Action. Upon request, Defendant shall also make available to EGLE, their employees, contractors, agents, or representatives with knowledge or relevant facts concerning the performance of the Remedial Action. The Plaintiffs shall treat as confidential all documents provided to Plaintiffs by the Defendant marked "confidential" or "proprietary."

**B.** Within 60 days of entry of this Order and to the extent not previously provided, Defendant shall provide EGLE with all technical analyses and environmental or engineering studies or reports related to its Response Activities at the Site. This information shall include, but it is not limited to, the following: a) pump test results and capture zone analysis for all extraction wells; b) analytical results from all soil and groundwater testing at the Site; c) all reports and analysis of groundwater flow and modeling; d) all maps depicting the current Site area,

delineation of contaminant plume, Prohibition Zone boundary and all monitoring and extraction well locations; e) Defendant's 1,4-dioxane transport model, including underlying assumptions regarding advective movement, retardation (adsorption), degradation, diffusion and dispersion; f) all results of pilot tests for any remedial activity; g) all hydrogeological assessments/investigations or contingency plans created by Defendant; h) all GSI compliance plans; and i) all remedial design data and related assumptions and analyses. The information provided by Defendant shall be promptly posted by EGLE on its Gelman website.

C. Within 60 days of entry of this Order, Defendant shall establish a cloud-based database designed specifically for the storage and validation of data and information associated with all monitoring wells, extraction wells and NPDES treatment and discharge activity. The data shall include identifying information for each well, including address, GPS, X and Y coordinates, top of casing and ground elevations, well logs and lithology, well and screen depths and survey information. This database will be identical to the database maintained by Gelman and will include all historical as well as future information. The information should be available for read-only electronic download in one or more native Excel files (or in a successor program to Excel provided that when the data are migrated to a new program, no data are lost). The database shall be updated by Defendant on a monthly basis. Defendant is required to investigate and remedy any data gaps or discrepancies identified by the Intervenor or members of the public. If information needed to fill data gaps is not available, Defendant will explain why the information is not available.

**L. Proposed Provisions to Provide an Ongoing Role and Rights of Intervenor Relative to Implementation and Enforcement of the Court's 2021 Order.**

In light of the Intervenor's role in this litigation, their interest on behalf of their residents in the effective implementation of the Court's 2021 Order, and their role and obligations relative to the implementation of the 2021 Order, the Intervenor need to have continuing involvement in connection with the implementation of the 2021 Order, as described below. Intervenor's requests take into consideration EGLE's constitutional and statutory role as the regulatory agency responsible for enforcing the terms of a remediation plan, as embodied in the 2021 Order.

The Proposed 4th CJ was accompanied by a proposed Order that had been negotiated among the parties and provided for Intervenor to have a role and ongoing rights relative to the Proposed 4th CJ. That proposed order, like the Proposed 4th CJ, was rejected by the governing bodies of the Intervenor. Nevertheless, because that proposed Order was necessary for

Intervenors to have a continuing role, and because those provisions now need to be incorporated into this Court's 2021 Order, much of what the Intervenors request in terms of an ongoing role relative to the 2021 Order is based on that proposed Order.

The 2021 Order includes a process for Dispute Resolution and identifies when and how that process would be invoked by Defendant or by EGLE, including the ability to seek court review and resolution if the Dispute Resolution process is not successful. Intervenors request that they be able to participate any time the Dispute Resolution process is invoked, and request that they—individually or collectively—have the right to invoke the Dispute Resolution in those same circumstances, including seeking court review, even if not invoked by Defendant or EGLE.

In situations for which the 2021 Order provides for Defendant or EGLE to proceed directly to court without engaging in the Dispute Resolution process, Intervenors also need to be able to participate in or initiate the court proceedings.

To the extent enforcement responsibilities are EGLE's regulatory responsibility, and/or in situations where the 2021 Order places defined responsibilities on EGLE, Intervenors need a role to be able to ensure EGLE undertakes those responsibilities appropriately. To that end, Intervenors request that they—individually or collectively—be able to petition EGLE if they believe EGLE has not fulfilled its responsibilities appropriately, and to seek court review and action if not satisfied with EGLE's response.

To implement the foregoing, Intervenors request that a section be included in the 2021 Order to provide for and govern their ongoing role and rights relative to implementation and enforcement of the 2021 Order. These proposed provisions are in addition to provisions throughout the 2021 Order that specifically provide certain rights or roles for the Intervenors, e.g., rights regarding Defendant's application to EGLE for an NPDES permit.

**1. Intervenor Must Have a Voice and Role Relative to Any Termination, Reduction, or Other Modification of Response Activities or Other Actions Under the 2021 Order.**

The Proposed 4th CJ provided procedures and criteria for, and the 2021 Order now requested by Intervenor also provides procedures and criteria for, termination, reduction, or other modifications by Defendant of certain response activities and other actions, including certification of completion and termination. Although the requested rights to be involved vary somewhat according to what the modification is, the requests generally are that:

1. Defendant be required to provide each Intervenor with its analysis supporting its position that the relevant response activity can be terminated, reduced, or otherwise modified under the criteria listed in the applicable section of the 2021 Order, including its Notice of Completion, when Defendant provides that analysis and documentation to EGLE;
2. EGLE be required to consult with Intervenor and consider in good faith their comments and concerns with respect to the proposed termination, reduction, or modification of the response activities;
3. After such consultation, EGLE be required to provide each of the Intervenor with its written response to Defendant's analysis when it provides that response to Defendant; and
4. An Intervenor be entitled to invoke Dispute Resolution under Section XVI of the 2021 Order if it disagrees with EGLE's response, and be entitled to participate fully if Defendant invokes the Dispute Resolution process under Section XVI of the 2021 Order.

With respect to the scientific advisory panel provided for in Section V.C.3, Intervenor also request that:

1. EGLE be required to consult with Intervenor with respect to EGLE's selection of its panel member under Section V.C.3.a;
2. Intervenor be entitled to provide the scientific advisory panel with any submissions requested by the panel under Section V.C.3.b;
3. EGLE be required to provide each of the Intervenor their response to the scientific advisory panel's recommendations when it provides said response to Defendant pursuant to Section V.C.3.c; and
4. An Intervenor be entitled to invoke Dispute Resolution under Section XVI of the 2021 Order if it disagrees with EGLE's position and be entitled to participate fully in any Dispute Resolution process invoked by Defendant under Sections V.C.3.c and XVI of the 2021 Order.

**2. Intervenor Must Have a Voice and Role Relative to Any Modification of the Prohibition Zone Boundaries Under the 2021 Order**

The Proposed 4th CJ provided procedures and criteria for, and the 2021 Order now requested by Intervenor also provides procedures and criteria for possible modification of the boundaries of the Prohibition Zone that are established by Consent Judgment Section V.A.2. The relevant sections are Sections V.A.2.f (Prohibition Zone Expansion) or V.A.6 (Prohibition Zone Boundary Review). Because those modifications require a motion to and decision by this Court, the rights and role Intervenor request is different than those that may be resolved without a dispute resolution process, and for which the Dispute Resolution process is an option.



If any modification of Prohibition Zone boundaries is proposed, Intervenor ask that:

1. Defendant and EGLE each be required to provide each Intervenor with all court filings filed pursuant to Sections V.A.2.f and/or V.A.6;
  2. EGLE be required to consult with Intervenor and consider in good faith their comments and concerns with respect to the proposed modification of the Prohibition Zone boundaries prior to filing any such filings with the Court; and
  3. Any Intervenor be entitled to participate fully in the court proceedings, including filing briefs and other documents to inform the Court of their comments and concerns.
- 3. Modification of the 2021 Order and of Obligations Thereunder by Stipulation Must Be Stipulated to by All Intervenor**

Section XXIV of the 2021 Order provides for Defendant and EGLE to stipulate to modifications of the 2021 Order. To avoid possible evasion of the rights of Intervenor to be included in a decision-making process that terminates, reduces, or otherwise modifies a provision of the 2021 Order, or terminates, reduces, or otherwise modifies an obligation of Defendant or EGLE or both under the 2021 Order, Intervenor ask that a provision be included to preclude Defendant and EGLE from making such modifications by stipulation unless each of the Intervenor also stipulates to the modification.

**4. Intervenor Need to Have a Role in the Development of Groundwater-Surface Water and Groundwater-Stormwater Systems Work Plans**

Because the venting of groundwater to surface water with 1,4-dioxane in concentrations that exceed the Generic GSI Criterion poses a risk to the health of residents as well as the environment, and because the venting or infiltration of groundwater containing 1,4-dioxane into a municipal segregated storm sewer or stormwater system, including a Drain not only poses a

similar risk, but also has an immediate impact on the municipality's obligations to prevent inflow of pollutants into the system, and to prevent discharge of pollutants at the system's outlet, Intervenor need to have a role in the development of plans to address such venting of groundwater with 1,4-dioxane. Therefore, to the extent Defendant is required to submit work plan(s) describing Response Activities and/or evaluations to be implemented/undertaken to address any area where groundwater is venting to surface water in concentrations that exceed the Generic GSI Criterion with respect to either the Eastern Area or Western Area, EGLE shall consult with Intervenor and consider in good faith their comments and concerns with respect to the adequacy of the proposed Response Activities and/or evaluations. To the extent Defendant is required to submit work plan(s) describing Response Activities and/or evaluations to be implemented/undertaken to address any area where groundwater is venting to or infiltrating into a municipal segregated storm sewer or stormwater system, including a Drain, EGLE shall consult with Intervenor and consider in good faith their comments and concerns with respect to the adequacy of the proposed Response Activities and/or evaluations.

**5. Intervenor Must Have a Voice and Role Relative to Determinations as to the Adequacy of the Financial Assurance Mechanism ("FAM") Requirements Submitted by Defendant**

If EGLE is required to make a decision under Section XX.C of the 2021 Order, including but not limited to a determination as to the adequacy of the amount of the FAM submitted by the Defendant, approval of Defendant's periodic calculation of long-term cleanup costs, approval of a conversion of the form of the FAM, or a determination that Defendant is no longer required to maintain a FAM, Intervenor need to be involved to ensure not only that the FAM is adequate, but also to ensure Defendant is basing its calculation of long-term cleanup costs on all the response activities required by this Order, is including and committing to undertaking all required response activities, and has the necessary financial resources to be able to fulfill its

obligations. Although Intervenors will get notice of and can be involved relative to most modifications of Defendant's cleanup obligations under the 2021 Order, involvement in these determinations is a safeguard both against modifications of response activities that might be done for purposes of and to reduce the calculation—and then implementation—of long-term cleanup costs, and to be confident in the determination of an adequate FAM.

**6. Intervenors Need the 2021 Order to Include a Means to Resolve Disagreements with Defendant Regarding Permits, License, and Other Agreements Required by or Necessary for Defendant to Undertake the Response Actions Required by the 2021 Order**

The response activities under the 2021 Order require Defendant to install a number of facilities such as monitoring wells and extraction wells in or on public properties or public rights-of-way. These facilities or types of facilities have been required under the existing Consent Judgment, as amended. However, the affected local governments were not parties to this litigation before they intervened, and the Consent Judgment has not had a provision for resolution of disputes between a local government and Defendant regarding permit or license terms for those facilities. For Defendant to be able to install the facilities it needs to install, and for the local governments to have the protections they need for their properties, rights-of-way, and the public, a dispute resolution process is necessary.<sup>17</sup> Intervenors request that the dispute resolution process under Section XVI of the 2021 Order be available to resolve disputes such as these.

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<sup>17</sup> For example, Defendant has approximately 130 monitoring wells in City of Ann Arbor rights-of-way and on City properties. Because almost all the license agreements for those placements had expired, the City proposed a Master License Agreement to cover all the wells with uniform terms and in a single document that also can be used for the additional monitoring wells the 2021 Order will require be installed. Although the City sent the draft Master License Agreement to Defendant on February 6, 2020, and although Defendant paid current and overdue license fees for all the wells, Defendant has neither executed the agreement nor provided any comments or reasons not to execute the agreement. Without a dispute resolution mechanism or the right to seek assistance from the Court, the situation is untenable.

**7. Proposed Provisions to Provide for Intervenor’s Ongoing Role and Rights**

To incorporate their requests for inclusion going forward, as described and discussed above, Intervenor request that a new section be incorporated into the 2021 Order as follows, probably as Section XXI, which would result in all later sections being renumbered, starting with Record Retention becoming renumbered as XXII. [New provisions in Red].

**XXI. ONGOING ROLE AND RIGHTS OF INTERVENORS**

- A. Termination of Response Activities. Before terminating or significantly reducing the response activities described in Sections V.A.3.f (Evergreen/Parklake), V.A.9 (Wagner Road), V.C.1 (Termination of Groundwater Systems), and VI.C.1–4 (Gelman Property Source Control) of this Order:
  - 1. Defendant shall provide each Intervenor with its analysis supporting its position that the relevant response activity can be terminated or significantly reduced under the criteria listed in those 2021 Order Sections when Defendant provides that analysis to EGLE;
  - 2. EGLE shall consult with the Intervenor and consider in good faith their comments and concerns with respect to the proposed termination/reduction of the response activities;
  - 3. After such consultation, EGLE shall provide each of the Intervenor its written response to Defendant’s analysis when it provides that response to Defendant; and
  - 4. Any Intervenor may invoke dispute resolution under Section XVI of this Order if it disagrees with EGLE’s response, and may fully participate in any dispute resolution process invoked under Section XVI of this Order.
  
- B. Prohibition Zone Boundary Modification. With regard to modification of the boundaries of the Prohibition Zone established by Consent Judgment Section V.A.2 under either Sections V.A.2.f (Prohibition Zone Expansion) or V.A.6 (Prohibition Zone Boundary Review):
  - 1. The Parties shall provide each Intervenor with all court filings filed pursuant to Sections V.A.2.f and/or V.A.6;
  - 2. EGLE shall consult with Intervenor and consider in good faith their comments and concerns with respect to the proposed modification of the Prohibition Zone boundaries prior to filing any such filings with the Court; and
  - 3. Any Intervenor may (1) participate fully in the court proceedings, including filing briefs and other documents to inform the Court of their comments and concerns.

C. Modification of Termination or Cleanup Criteria. With regard to modification of the termination or cleanup criteria under Section V.C:

1. Defendant shall provide each Intervenor with any proposal prepared pursuant to Section V.C.2.b when it provides the proposal to EGLE, together with all supporting documentation;
2. EGLE shall consult with Intervenors and consider in good faith their comments and concerns with respect to the proposed modification of the termination or cleanup criteria;
3. Following such consultation, EGLE shall provide Intervenors its response to Defendant's proposal when it provides the response to Defendant;
4. Any Intervenor may invoke the dispute resolution procedures described in Section XVI of this Order if it disagrees with EGLE's position. Moreover, any Intervenor may participate fully in any dispute resolution process initiated by Defendant under Section XVI of this Order; and
5. If Defendant invokes the procedures set forth in Section V.C.3:
  - a. EGLE shall consult with Intervenors with respect to EGLE's selection of its panel member under Section V.C.3.a;
  - b. Intervenors may provide the scientific advisory panel with any submissions requested by the panel under Section V.C.3.b;
  - c. EGLE shall provide to Intervenors their response to the scientific advisory panel's recommendations when it provides said response to Defendant pursuant to Section V.C.3.c; and
  - d. Any Intervenor may invoke the dispute resolution procedures described in Sections V.C.3.c and XVI of this Order if it disagrees with EGLE's position and may participate fully in any dispute resolution process invoked by Defendant under Sections V.C.3.c and XVI of this Order.

D. Termination of Post-Termination Monitoring. With regard to termination of post-termination monitoring under Section V.D of this Order:

1. Defendant shall provide a copy of any request to terminate post-termination monitoring under V.D to each Intervenor when it submits its request to EGLE;
2. EGLE shall consult with Intervenors and consider in good faith their comments and concerns with respect to the proposed termination of the post-termination monitoring;
3. Following such consultation, EGLE shall provide to Intervenors its written response to any request to terminate post-termination monitoring under V.D when it provides the response to Defendant; and
4. Any Intervenor may invoke dispute resolution under Section XVI of this Order if it disagrees with EGLE's response and may participate fully in any dispute resolution process invoked by Defendant under Section XVI.

- E. Groundwater-Surface Water Work Plans. To the extent Defendant is required to submit a work plan(s) describing Response Activities and/or evaluations to be implemented/undertaken to address any area where groundwater is venting to surface water with 1,4-dioxane in concentrations that exceed the Generic GSI Criterion with respect to either the Eastern Area or Western Area, EGLE shall consult with Intervenors and consider in good faith their comments and concerns with respect to the adequacy of the proposed Response Activities and/or evaluations.
- F. Groundwater-Stormwater System Work Plans. To the extent Defendant is required to submit a work plan(s) describing Response Activities and/or evaluations to be implemented/undertaken to address any area where groundwater with 1,4-dioxane at a detectible level is venting to or infiltrating into a municipal stormwater or storm sewer system, including drains of the Washtenaw County Water Resources Commission, EGLE shall consult with Intervenors and consider in good faith their comments and concerns with respect to the adequacy of the proposed Response Activities and/or evaluations.
- G. Financial Assurance Mechanism (“FAM”) Requirements. If EGLE is required to make a decision under Section XX.C of this Order, including but not limited to a determination as to the adequacy of the amount of the FAM submitted by the Defendant, approval of Defendant’s periodic calculation of long-term cleanup costs, approval of a conversion of the form of the FAM, or a determination that Defendant is no longer required to maintain a FAM:
1. EGLE shall notify and consult with the Intervenors and consider in good faith their comments and concerns with respect to the determination being made by EGLE; and
  2. Any Intervenor may invoke dispute resolution under Section XVI of this Order if it disagrees with EGLE’s determination, and may participate fully in any dispute resolution process invoked by Defendant under Section XVI related to a determination by EGLE under Section XX.C.
- H. Certification and Termination. When Defendant submits its Notification of Completion and draft final report under Section XXVI.A:
1. Defendant shall provide a copy of its Notification of Completion and draft final report to each Intervenor when it submits these documents to EGLE;
  2. EGLE shall consult with Intervenors and consider in good faith their comments and concerns with respect to the Notice of Completion and draft final report;
  3. After such consultation, EGLE shall provide its Certificate of Completion to each Intervenor when it provides the Certificate to Defendant;
  4. Any Intervenor may invoke dispute resolution under Section XVI of this Order if it disagrees with EGLE’s issuance of a Certificate of Completion, and may fully participate in any dispute resolution process invoked by

Defendant under Section XVI related to EGLE’s failure to issue such Certificate.

- I. Modification of this Order. This Order may not be modified by stipulation unless each of the Intervenor stipulates to the modification.
- J. Use of Public Lands and Rights-of-Way by Defendant. Because Defendant must continue to occupy properties and public rights-of-way owned or under the control of one or more of the Intervenor for wells and other facilities, and will be required to place additional wells and other facilities on properties and public rights-of-way owned or under the control of one or more of the Intervenor, and because Intervenor require Defendant to get and comply with the others of permits and/or licenses to occupy those lands for those purposes, Defendant or an Intervenor may invoke dispute resolution under Section XVI of this Order to resolve disputes related to Defendant’s use of the Intervenor’s properties and/or public rights-of-way for its facilities.

**M. Proposed Provisions Regarding Modification of the 2021 Order.**

**1. The possible need for modifications of the 2021 Order.**

The Proposed 4<sup>th</sup> CJ recognized the possible need and provided for modifications, which might be stipulated by EGLE and Gelman, subject to ongoing rights of the Intervenor (provided in a separate proposed Order). This is true because Response Activities and Remedial Actions required by this Order are not static, but are initial requirements based on the current scientific and technical understanding of 1,4-dioxane that is present at and that has migrated from the Gelman Property. As stated at several places in the Intervenor’s Expert Report, future data or knowledge may reveal the need for changes. See, as a few examples:

- Int. Exp. Rept. P.5 [The actions requested by the Intervenor “\*\*\*represent initial actions needed to respond to the reduced groundwater cleanup standards. Additional remedial activities are likely to be necessary in response to information gained from the initial actions described herein.”];
- Int. Exp. Rept. P.9 [“The need to install additional perimeter monitoring wells in strategic positions may become apparent after the results of the new wells proposed here and in the Proposed 4th CJ are analyzed.”];
- Int. Exp. Rept. P.14 [“The Intervenor acknowledge that iterative investigations in areas of subsurface uncertainty, such as the region between the northern Prohibition Zone boundary and Barton Pond, are reasonable and

customary. \*\*\* In the event that 1,4-dioxane is detected in well DD, EE, or FF, additional investigations may be required to fully understand the hydraulic gradient and contaminant transport pathways in this area.”];

- Int. Exp. Rept. P.17, regarding possible future investigations prompted by the results of investigations related to possible discharges to Allen Creek [“These activities are sequential, with each informing and optimizing the next. Information generated by any of these activities could lead to the need for additional investigations.”];
- Int. Exp. Rept. P.30, regarding possible addition of extraction wells on Gelman Property [“installation of all proposed wells within a narrow time frame, with a contingency to add additional wells as individual well performance is assessed, will accelerate mass removal and enhance compliance with Western Area GSI objectives.”]

**2. Proposed provisions for possible need for modifications of the 2021 Order.**

To address possible future needs for modifications to the Order, the Intervenors propose that the Section of the Proposed 4th CJ addressing Modifications (pp. 74-74) be amended as follows [with original provisions in black and new provisions in red]:

**XXV. MODIFICATION**

The Response Activities and Remedial Actions required by this Order are not static, but are initial requirements based on the current scientific and technical understanding of 1,4-dioxane that is present at and that has migrated from the Gelman Property. As more information and data become available in the future, it may be appropriate to modify this Order to increase or decrease the required Response Activities and Remedial Actions. As examples: Data from monitoring wells required herein may show the need for additional monitoring wells or other investigations to define the extent and subsurface transport of 1,4-dioxane; or Data from extraction wells or related to other Remedial Actions may show that added extraction or Remedial Actions may be needed in some areas and less may be appropriate in other areas. Any such modifications to this Order may be proposed by Plaintiff, by Defendant or by one or more of the Intervenors, and shall be subject to the dispute resolution provisions in Section XVI. This Order may not be modified except by order of this Court. Remedial Plans, work plans, or other submissions made pursuant to this Order may be modified by mutual agreement of the Defendant and EGLE, subject to the ongoing rights of the Intervenors under Section XXI of this Order.



**V. CONCLUSION**

For the foregoing reasons and for the reasons provided and discussed in the Intervenor's Expert Report, the Intervenor respectfully request that their Proposed "**ORDER IMPLEMENTING REVISED CLEANUP CRITERIA AND MODIFYING EXISTING RESPONSE ACTIVITY ORDERS AND JUDGMENTS ("2021 ORDER")**" (attached hereto as Exhibit M) be entered by the Court.

Respectfully submitted:

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Officer Jimena Loveluck*

Dated: April 30, 2021.

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Dated: April 30, 2021

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Dated: April 30, 2021.

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Dated: April 30, 2021.

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Dated: April 30, 2021.

STATE OF MICHIGAN  
IN THE WASHTNAW COUNTY CIRCUIT COURT

ATTORNEY GENERAL FOR THE  
STATE OF MICHIGAN, *ex rel.* MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
AND ENVIRONMENT,

Case No. 88-34734-CE  
Hon. Timothy P. Connors

Plaintiff,  
and

CITY OF ANN ARBOR, WASHTENAW COUNTY,  
WASHTENAW COUNTY HEALTH  
DEPARTMENT, WASHTENAW COUNTY  
HEALTH OFFICER ELLEN RABINOWITZ, in her  
official capacity, the HURON RIVER WATERSHED  
COUNCIL, and SCIO TOWNSHIP,

Intervening Plaintiffs,

-v-

GELMAN SCIENCES, INC., d/b/a PALL LIFE  
SCIENCES, a Michigan Corporation,

Defendant.

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**INDEX OF EXHIBITS**

Exhibit A	Complied Consent Judgment Changes
Exhibit B	Remediation and Enforcement Order
Exhibit C	EGLE Decision Document
Exhibit D	Gelman's Supplemental Filing in Support of Remedial Alternative
Exhibit E	Unit E Order
Exhibit F	Prohibition Zone Order
Exhibit G	Order re Potential Remedial Modifications
Exhibit H	Third Amendment to Consent Judgment
Exhibit I	RRD Policy and Procedure No. 33
Exhibit J	Stipulated Order Amending Previous Remediation Orders
Exhibit K	Finding of Emergency
Exhibit L	Proposed 4 <sup>th</sup> Consent Judgment
Exhibit M	2021 Order
Exhibit N	Residential Well Sampling

# *EXHIBIT A*

STATE OF MICHIGAN

IN THE CIRCUIT COURT FOR THE COUNTY OF WASHTENAW

FRANK J. KELLEY, Attorney General  
for the State of Michigan, ex rel,  
'MICHIGAN NATURAL RESOURCES  
COMMISSION, MICHIGAN WATER  
RESOURCES COMMISSION, and  
MICHIGAN DEPARTMENT OF  
NATURAL  
RESOURCES,  
Plaintiffs,  
v  
GELMAN SCIENCES, INC.,  
a Michigan corporation,  
Defendant.

File No. 88-34734-CE  
Honorable Patrick J. Conlin

---

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**CONSENT JUDGMENT (AS AMENDED BY FIRST, SECOND,  
AND THIRD AMENDMENTS)**

[The introductory language to the Original Consent Judgment, and to the First, Second, and Third Amendments, are omitted. Those introductions were original to each document; not amendments of prior introductions.]

The following text is compiled from the original Consent Judgment language,  
as amended by the First, Second and Third Amendments

**I. JURISDICTION**

A. This Court has jurisdiction over the subject matter of this action. This Court also has personal jurisdiction over the Defendant.

B. This Court shall retain jurisdiction over the Parties and the subject matter of this action to enforce this Judgment and to resolve disputes arising under the Judgment.

## **II. PARTIES BOUND**

This Consent Judgment applies to, is binding upon, and inures to the benefit of Plaintiffs, Defendant, and their successors and assigns.

## **III. DEFINITIONS**

Whenever the terms listed below are used in this Consent Judgment or the Attachments which are appended hereto, the following definitions shall apply:

A. "Consent Judgment" or "Judgment" shall mean this Consent Judgment and all Attachments appended hereto. All Attachments to this Consent Judgment are incorporated herein and made enforceable parts of this Consent Judgment.

B. "Day" shall mean a calendar day unless expressly stated to be a working day. "Working Day" shall mean a day other than a Saturday, Sunday, or a State legal holiday. In computing any period of time under this Consent Judgment, where the last day would fall on a Saturday, Sunday, or State legal holiday, the period shall run until the end of the next working day.

C. "Defendant" shall mean Gelman Sciences, Inc.

D. "Evergreen Subdivision Area" shall mean the residential subdivision generally located north of I-94 and between Wagner and Maple Roads, bounded on the west by Rose Street, on the north by Dexter Road, and on the south and east by Valley Drive.

E. "Gelman" or "GSI" shall mean Gelman Sciences, Inc.

F. "GSI Property" shall mean the real property described in Attachment A, currently owned and operated by Defendant in Scio Township, Michigan.

G. "Groundwater Contamination" or "Groundwater Contaminant" shall mean 1,4-dioxane in groundwater at a concentration in excess of 85 micrograms per liter ("ug/l") (subject to approval by the Court of the application of a new criteria) determined by the sampling and analytical method(s) described in Attachment B to this Consent Judgment, subject to review and approval by MDNRE.

H. "MDNRE" shall mean the Michigan Department of Natural Resources and Environment, the successor to the Michigan Department of Environmental Quality ("MDEQ"), the Michigan Department of Natural Resources ("MDNR"), and to the Water Resources Commission. All references to the "MDEQ," "MDNR," or to the "Water Resources Commission" in this Consent Judgment, as amended, shall be deemed to refer to the MDNRE or any successor agency.

I. "Parties" shall mean Plaintiffs and Defendant.

J. "Plaintiffs" shall mean the Attorney General of the State of Michigan, ex rel, Michigan Department of Natural Resources and Environment.

K. "Redskin Well" means the purge well currently located on the Redskin Industries property.

L. "Remedial Action" or "Remediation" shall mean removal, treatment, and proper disposal of groundwater and soil contaminants pursuant to the terms and conditions of this Consent Judgment and work plans approved by the MDNR under this Consent Judgment.

M. "Site" shall mean the GSI Property and other areas affected by the migration of groundwater contamination emanating from the GSI Property.

N. "Soil Contamination" or "Soil Contaminant" shall mean 1,4-dioxane in soil at a concentration in excess of 1700 ug/kg as determined by the sampling and analytical method(s)

described in Attachment C, or other higher concentration limit derived by means consistent with Mich Admin Code R 299.5718 or MCL 324.20120a.

O. "Spray Irrigation Field" shall mean that area of the GSI site formerly used for spray irrigation of treated process wastewater, as depicted on the map included as Attachment D.:

P. "Prohibition Zone Order" shall mean the Court's Order Prohibiting Groundwater Use, dated May 17, 2005, which established a judicial institutional control.

Q. "Prohibition Zone" shall mean the area that is subject to the institutional control established by the Prohibition Zone Order.

R. "Expanded Prohibition Zone" shall mean the area that shall be subject to the institutional control established by the Prohibition Zone Order pursuant to this Third Amendment to the Consent Judgment. A map depicting the Prohibition Zone and the Expanded Prohibition Zone is attached as Attachment E.

S. "Unit E Order" shall mean the Court's Opinion and Order Regarding Remediation of the Contamination of the Unit E Aquifer dated December 17, 2004.

T. "Eastern Area" shall mean the part of the Site that is located east of Wagner Road and the areas encompassed by the Prohibition Zone and Expanded Prohibition Zone.

U. "Western Area" shall mean that part of the Site located west of Wagner Road, excepting the Little Lake Area System described in Section V.C.

#### **IV. IMPLEMENTATION OF REMEDIAL ACTION BY DEFENDANT**

Defendant shall implement the Remedial Action to address groundwater and soil contamination at, and emanating from, the GSI Property in accordance with (1) the terms and conditions of this Consent Judgment; and (2) work plans approved by the MDNR pursuant to this Consent Judgment.



## V. GROUNDWATER REMEDIATION

Defendant shall design, install, operate, and maintain the systems described below. The objectives of these systems shall be to extract the contaminated groundwater from the aquifers at designated locations for treatment (as required) and proper disposal to the extent necessary to prevent the plumes of groundwater contamination emanating from the GSI Property from expanding beyond the current boundaries of such plumes, except into and within the Prohibition Zone and Expanded Prohibition Zone (subject to paragraph 9 of the Prohibition Zone Order, as modified by Section V.A.2.b., of this Consent Judgment with regard to the northern boundaries of the Prohibition Zone and Expanded Prohibition Zone), as described below. Defendant also shall implement a monitoring program to verify the effectiveness of these systems.

### A. Eastern Area System

1. Objectives. The remedial objectives of the Eastern Area System (“Eastern Area Objectives”) shall be:

a. Maple Road Containment Objective. The current Unit E objective set forth in the Unit E Order of preventing contaminant concentrations above the groundwater-surface water interface criterion of 2,800 ug/l (subject to approval by the Court of the application of a new criteria) from migrating east of Maple Road shall apply to the Eastern Area System, regardless of the aquifer designation, or depth of groundwater or groundwater contamination.

b. Prohibition Zone Containment Objective. Use of groundwater in the Prohibition Zone and Expanded Prohibition Zone will be governed by the Prohibition Zone Order regardless of the aquifer designation or the depth of the groundwater or groundwater contamination. MDNRE-approved legal notice of the proposed Prohibition Zone expansion shall be provided at Defendant’s sole expense.

2. Eastern Area Response Activities. The following response actions shall be implemented:

a. Maple Road Extraction. Defendant shall continue to operate TW-19 as necessary to meet the Maple Road containment objective.

b. Verification Plan. Defendant shall implement its June 3, 2009 Plan for Verifying the Effectiveness of Proposed Remedial Obligations (“Verification Plan”), as modified by this Sections V.A.2.b. and c., to ensure that any potential migration of groundwater contamination outside of the Expanded Prohibition Zone is detected before such migration occurs. Defendant shall install four additional monitoring well clusters in the Evergreen Subdivision area at the approximate locations indicated on the map attached as Attachment F. If concentrations of 1,4-dioxane in one or more of the three new monitoring wells installed at the perimeter of the Expanded Prohibition Zone or the existing MW-120s, MW-120d, MW-121s, and MW-121d exceed 20 ug/l, Defendant shall conduct a hydrogeological investigation to determine the fate of any groundwater contamination in this area as described in the Verification Plan. This investigation will be conducted pursuant to a MDNRE-approved work plan. The work plan shall be submitted within 45 days after the first exceedence. If concentrations in any of the perimeter wells exceed 85 ug/l (or any other criteria approved by the Court) or if the Defendant’s investigation or monitoring indicates that the plume of groundwater contamination will migrate outside of the Prohibition Zone or Expanded Prohibition Zone, Defendant shall conduct a Feasibility Study of available options for addressing the situation pursuant to a MDNRE-approved format. The Feasibility Study shall be submitted within 90 days after a determination by the Defendant or a written notification by the MDNRE that one is required. This Feasibility Study shall include options other than simply expanding the Prohibition Zone or Expanded

Prohibition Zone, although that option may be included in the analysis. The parties agree that any further expansion of the northern boundaries of the Prohibition Zone or Expanded Prohibition Zone to address migration of groundwater contamination outside of the Prohibition Zone or Expanded Prohibition Zone should be avoided, unless there are compelling reasons to do so. The Defendant's Feasibility Study shall identify a preferred alternative. The MDNRE shall review the Feasibility Study and either approve the Defendant's preferred alternative or submit changes as provided in Section X of the Consent Judgment. The Defendant shall implement the approved alternative, or any changes submitted by the MDNRE unless the Defendant initiates Dispute Resolution under Section XVI of the Consent Judgment.

c. Additional Evergreen Monitoring Wells. Defendant shall install the new well clusters described in Section V.A.2.b. according to a schedule to be approved by the MDNRE . Each of the new well clusters will include two to three additional monitoring wells, and the determination of the number of wells shall be based on the Parties' evaluation of the geologic conditions present at each location, consistent with past practice. The easternmost of these well clusters shall be installed last and the data obtained from the other newly installed well clusters and existing wells will be used to determine the location of the easternmost well cluster. The easternmost well cluster will be installed approximately one year after the other well clusters are installed and after the Parties have been able to evaluate at least four quarters of data from the new wells and existing well, unless the Parties agree that it should be installed sooner.

d. Drilling Techniques. Borings for new wells installed pursuant to Section V.A.2. shall be drilled to bedrock unless a different depth is approved by MDNRE or if conditions make such installation impracticable. The MDNRE reserves the right to require alternate drilling techniques to reach bedrock if standard methods are not able to do so. If the

Defendant believes that drilling one or more of these wells to bedrock is not practical due to the geologic conditions encountered and/or that such conditions do not warrant the alternative drilling technique required by the MDNRE, Defendant may initiate dispute resolution under Section XVI of the Consent Judgment. The wells shall be installed using Defendant's current vertical profiling techniques, which are designed to minimize the amount of water introduced during drilling, unless the MDNRE agrees to alternate techniques.

e. Downgradient Investigation. The Defendant shall continue to implement its Downgradient Investigation Work Plan as approved by the MDNRE on February 4, 2005, to track the groundwater contamination as it migrates to ensure any potential migration of groundwater contamination outside of the Prohibition Zone or Expanded Prohibition Zone is detected before such migration occurs.

f. Continued Evergreen Subdivision Area Groundwater Extraction as Necessary. The Defendant shall continue to operate the Evergreen Subdivision area extraction wells LB-1 and LB-3 (the "LB Wells") at a combined purge rate of 100 gallons per minute (gpm), in order to reduce the migration of 1,4-dioxane, until such time as it determines that the Eastern Area cleanup objectives will be met at a reduced extraction rate or without the need to operate these extraction wells. Before significantly reducing or terminating extraction from the LB Wells, the Defendant shall consult with Plaintiffs and provide a written analysis, together with the data that supports its conclusion. MDNRE will review the analysis and data and provide a written response to Defendants within 56 days after receiving Defendant's written analysis and data. If the MDNRE disagrees with the Defendant's decision to reduce or terminate extraction, it may dispute the decision in Court within 15 days of its written response. Within 15 days of the filing of MDNRE's dispute, Defendant may file a response to the petition. The Parties may agree

to extend these time frames to facilitate resolution of the dispute. The Defendant shall not significantly reduce or terminate extraction from the LB Wells while MDNRE is reviewing or disputing the Defendant's determination. MDNRE will make all reasonable efforts to have the motion resolved in a reasonable timeframe. If extraction from the LB Wells is terminated either by the agreement of the Parties or an order of the Court, the Defendant shall continue to maintain the LB Wells in an operable condition until such time as the Parties agree (or the Court decides) that the well(s) may be abandoned. Defendant shall abandon the Allison Street (AE-3) extraction well operation upon entry of this Third Amendment.

g. Well Identification. Defendant shall implement the Expanded Prohibition Zone Well Identification Work Plan as approved by MDNRE on February 4, 2011, pursuant to the approved schedule, unless Defendant files a Petition with the Court by March 16, 2011, seeking clarification of the scope of this Court's Prohibition Zone Order.

h. Plugging of Private Water Supply Wells. The Prohibition Zone Order's requirement that Defendant plug and replace any private drinking water wells by connecting those properties to municipal water shall apply to the Expanded Prohibition Zone. Defendant shall also properly plug non-drinking water wells in the Expanded Prohibition Zone unless it petitions the Court to clarify whether the Prohibition Zone Order requires Defendant to plug such wells and the Court determines it does not.

3. Future Inclusion of Triangle Property in the Expanded Prohibition Zone. MDNRE may request that the triangle piece of property located along Dexter/M-14 (Triangle Property) be included in the Expanded Prohibition Zone if the data obtained from the monitoring wells installed pursuant to Section V.A.2.c., above, (specifically, the Wagner Road and Ironwood/Henry monitoring wells) and other nearby wells indicate that the chemical and

hydraulic data does not support Defendant's conceptual model regarding groundwater and contaminant flow in the area. Defendant may dispute such request pursuant to Section XVI of this Consent Judgment.

a. If the Triangle Property is later included in the Expanded Prohibition Zone, any further expansion beyond the Triangle Property shall be subject the same Feasibility Study requirements of Section V.A.2.b.

b. If a drinking water supply well is installed on the Triangle Property in the future, Defendant shall take the necessary steps to obtain permission to sample the well on a schedule approved by the MDNRE. Defendant shall monitor such wells on the MDNRE-approved schedule unless or until that property is included in the Expanded Prohibition Zone, at which time, the water supply well(s) shall be addressed as part of the well identification process.

4. Operation and Maintenance. Subject to Section V.A.2.f and V.A.7., Defendant shall operate and maintain the Eastern Area System as necessary to meet the Eastern Area Objectives. Defendant shall continuously operate, as necessary, and maintain the Eastern Area System according to MDNRE-approved operation and maintenance plans until Defendant is authorized to terminate extraction well operations pursuant to Section V.D.1.a.

5. Treatment and Disposal. Groundwater extracted by the extraction well(s) in the Eastern Area System shall be treated (as necessary) using methods approved by the MDNRE and disposed of using methods approved by the MDNRE, including, but not limited to, the following options:

a. Groundwater Discharge. The purged groundwater shall be treated to reduce 1,4-dioxane concentrations to the level required by the MDNRE, and discharged to

groundwaters at locations approved by MDNRE in compliance with a permit or exemption authorizing such discharge.

b. Sanitary Sewer Discharge. Use of the sanitary sewer leading to the Ann Arbor Wastewater Treatment Plant is conditioned upon approval of the City of Ann Arbor. If discharge is made to the sanitary sewer, the Eastern Area System shall be operated and monitored in compliance with the terms and conditions of an Industrial User's Permit from the City of Ann Arbor, and any subsequent written amendment of that permit made by the City of Ann Arbor. The terms and conditions of any such permit and any subsequent amendment shall be directly enforceable by the MDNRE against Defendant as requirements of this Consent Judgment.

c. Storm Drain Discharge. Use of the storm drain is conditioned upon issuance of an NPDES permit and approval of such use by the City of Ann Arbor and the Allen Creek Drainage District. Discharge to the Huron River via the Ann Arbor stormwater system shall be in accordance with the NPDES Permit and conditions required by the City and the Drainage District. If the storm drain is to be used for disposal, no later than twenty-one (21) days after permission is granted by the City and the Drainage District to use the storm drain for disposal of purged groundwater, Defendant shall submit to MDNRE, the City of Ann Arbor, and the Drainage District for their review and approval, a protocol under which the purge system shall be temporarily shut down: (i) for maintenance of the storm drain and (ii) during storm events to assure that the stormwater system retains adequate capacity to handle run-off created during such events. The purge system shall be operated in accordance with the approved protocol for temporary shutdown.

d. Existing or Additional/Replacement Pipeline to Wagner Road

Treatment Facility. Installation of an additional pipeline or a pipeline replacing the existing pipeline to the Wagner Road Treatment Facility is conditioned upon approval of such installation by the MDNRE. If the pipeline is proposed to be installed on public property, the pipeline installation is conditioned upon approval of such installation by the City of Ann Arbor, Scio Township, and the Washtenaw County Road Commission, if required by statute or ordinance, or by Order of the Court pursuant to the authority under MCL 324.20135a. Defendant shall design the pipeline in compliance with all state requirements and install the pipeline with monitoring devices to detect any leaks. If leaks are detected, the system will automatically shut down and notify an operator of the condition. In the event that any leakage is detected, Defendant shall take any measures necessary to repair any leaks and perform any remediation that may be necessary. To reduce the possibility of accidental damage to the pipeline during any future construction, the location of the pipeline will be registered with MISS DIG System, Inc. Nothing in this subsection shall relieve Defendant of its obligations to properly treat and dispose of contaminated groundwater in compliance with the Consent Judgment and applicable permit(s), using one or more of the other options for disposal, as necessary.

e. Additional Pipeline from Maple Road Extraction Well(s).

Installation and operation of a proposed pipeline from the Maple Road Area to Evergreen area is conditioned upon approval of such installation and operation by the MDNRE. If the pipeline is proposed to be installed on public property, the pipeline installation is conditioned upon approval of such installation by the appropriate local authorities, if required by statute or ordinance, or Order of the Court pursuant to the authority under MCL 324.20135a. Defendant shall design any such pipeline in compliance with all state requirements and install it with monitoring devices to



detect any leaks. In the event any leakage is detected, Defendant shall take any measures necessary to repair any leaks and perform any remediation that may be necessary. The pipeline shall be registered with the MISS DIG System, Inc., to reduce the possibility of accidental damage to the pipeline. Defendant may operate such pipeline to, among other things, convey groundwater extracted from TW-19 to the Wagner Road treatment systems, where it can be treated and disposed via the Defendant's permitted surface water discharge (capacity permitting).

6. Monitoring Plans. Defendant shall implement a MDNRE-approved monitoring plan for the Eastern Area. The monitoring plans shall include the collection of data to measure the effectiveness of the System in (a) ensuring that any potential migration of groundwater contamination outside of the Prohibition Zone or Expanded Prohibition Zone is detected before such migration occurs; (b) tracking the migration of the groundwater contamination to determine the need for additional investigation to ensure that there are adequate monitoring points to meet objective in Subsection (a) of this Section, including the determination of the fate of groundwater contamination when and if it reaches the portion of the Huron River that is the easternmost extent of the Prohibition Zone; (c) verifying that concentrations of 1,4-dioxane greater than the groundwater-surface water interface criterion of 2800 ug/l (or any other criterion approved by the Court) does not migrate east of Maple Road; (d) complying with the applicable limitations on the discharge of the purged groundwater; and (e) evaluating capture areas for extraction wells and potential changes in groundwater flow from changes in extraction rates and locations.

To satisfy the objectives of this Section V.A.6, Defendant shall implement the following monitoring plans:

a. The portion of Defendant's Comprehensive Groundwater Monitoring Plan, May 4, 2009, amended June 2, 2009 (ACGMP), relevant to the Eastern Area, upon approval of the MDNRE as provided in Section X. Defendant shall continue to implement the currently approved monitoring plan until MDNRE approves the final ACGMP for the Eastern Area.

b. Defendant's Performance Monitoring Plan for Maple Road, which shall include the existing MW-84d as a monitoring point in lieu of the previously requested additional monitoring well closer to Maple Road, which shall be incorporated into the ACGMP for the Eastern Area.

The monitoring plans shall be continued until terminated pursuant to Section V.E.

7. Wagner Road Extraction. TW-18 and TW-21 (the "Wagner Road Wells") shall be considered part of the Eastern Area System even though they are located just West of Wagner Road. The Defendant shall initially operate the Wagner Road Wells at a combined 200 gallons per minute (gpm) extraction rate (with a minimum extraction rate of 50 gpm for each of the wells). The Defendant shall continue to operate its Wagner Road Wells in order to reduce the migration of 1,4-dioxane east of Wagner Road at this rate until such time as it determines that the Eastern Area cleanup objectives will be met with a lower combined extraction rate or without the need to operate these wells. Before significantly reducing or terminating extraction from the Wagner Road Wells, Defendant shall consult with Plaintiffs and provide a written analysis, together with the data that supports its conclusion. MDNRE will review the analysis and data and provide a written response to Defendants within 56 days after receiving Defendant's written analysis and data. If the MDNRE disagrees with the Defendant's decision to reduce or terminate extraction, it may dispute the decision in Court within 15 days of the date of its written response.

Within 15 days of the filing of MDNRE's dispute, Defendant may file a response to the petition.

The Parties may agree to extend these time frames to facilitate resolution of the dispute.

The Defendant shall not significantly reduce or terminate the Wagner Road extraction while MDNRE is reviewing or disputing the Defendant's determination. MDNRE will make all reasonable efforts to have the motion resolved in a reasonable timeframe.

8. Options Array for Transmission Line Failure/Inadequate Capacity.

The Defendant has provided the MDNRE with documentation regarding the life expectancy of the deep transmission line and an Options Array (attached as Attachment G). The Options Array describes the various options that may be available if the deep transmission line fails or the 200 gpm capacity of the existing deep transmission line that transports groundwater from the Eastern Area System to the treatment system located on the GSI Property proves to be insufficient to meet the Eastern Area Objectives.

B. Western Area System

1. Western Area System Non-Expansion Cleanup Objective. The Defendant shall prevent the horizontal extent of the groundwater contamination in the Western Area from expanding. The horizontal extent shall be the maximum horizontal areal extent of groundwater contamination regardless of the depth of the groundwater contamination (as established under Section V.B.2.c. of this Consent Judgment). Continued migration of groundwater contamination into the Prohibition Zone or Expanded Prohibition Zone shall not be considered expansion and is allowed. A change in the horizontal extent of groundwater contamination resulting solely from the Court's application of a new cleanup criterion shall not constitute expansion. Nothing in this Section prohibits the Plaintiffs from seeking additional response activities pursuant to Section XVIII.E of this Consent Judgment. Compliance with the Non-Expansion Cleanup Objective shall be established and verified by the Compliance Well Network to be developed by the Parties as

provided in Sections V.B.2.c and d., below (“Compliance Well Network”). There is no independent mass removal requirement or a requirement that the Defendant operate any particular extraction well(s) at any particular rate beyond what is necessary to prevent the prohibited expansion, provided that Defendant’s ability to terminate all groundwater extraction in the Western Area is subject to Section V.D.1.c. and the establishment of property use restrictions as required by Section V.B.2.e. If prohibited expansion occurs, Defendant shall undertake additional response activities to return the groundwater contamination to the boundary established by the Compliance Well Network (such response activities may include recommencement of extraction at particular locations).

Plaintiffs agree to modify the remedial objective for the Western Area as provided herein to a no expansion performance objective in reliance on Defendant’s agreement to comply with a no expansion performance objective for the Western Area. To ensure compliance with this objective, Defendant acknowledges that in addition to taking further response action to return the horizontal extent of groundwater contamination to the boundary established by the Compliance Well Network, Defendant shall be subject to stipulated penalties for violation of the objective as provided in Section XVII. Nothing in this paragraph shall limit Defendant’s ability to contest the assessment of such stipulated penalties as provided in this Consent Judgment.

2. Western Area Response Activities. The following response activities shall be implemented:

a. Extraction Wells. The Western Area response activities shall include the operation of groundwater extraction wells as necessary to meet the objective described in Section V.B.1. Purged groundwater from the Western Area System shall be treated with ozone/hydrogen peroxide or ultraviolet light and oxidizing agent(s), or such other method

approved by the MDNRE to reduce 1,4-dioxane concentrations to the level as required by NPDES Permit No. MI-0048453, as amended or reissued. Discharge to the Honey Creek tributary shall be in accordance with NPDES Permit No. MI-0048453, as amended or reissued.

b. Decommissioning Extraction Wells. Within 14 days after entry of this Third Amendment, Defendant shall submit to MDNRE a list of Western Area extraction wells that it intends to decommission (take out-of-service) in 2011. The MDNRE has the right to petition the Court to stop the Defendant from taking such extraction well(s) out-of-service within 60 days of receiving the list identifying such extraction well(s). The Defendant shall maintain all other extraction wells, including, but not limited to, TW-2 (Dolph Park) and TW-12, in operable condition even if it subsequently terminates extraction from the well(s) until such time as the Parties agree (or the Court decides) that the well(s) may be abandoned.

c. Western Area Delineation Investigation. Defendant shall complete the following investigation, as may be amended by agreement of the Parties to reflect data obtained during the investigation, to address gaps in the current definition of the plume and to further define the horizontal extent of groundwater contamination in the Western Area:

- i. Install monitoring wells screened to monitor the intermediate (Unit D2) and deep (Unit E) zones at/near the existing MW-20. An additional monitoring well at or near existing MW-36 will not be necessary unless the results from the wells installed at/near MW-20 are inconsistent with the Defendant's conceptual flow model (that the contamination in the shallower unit does not continue migrating to the west, but instead drops into the deeper unit and flows east into the Prohibition Zone or Expanded Prohibition Zone).
- ii. Install a monitoring well cluster just west of Wagner Road and South of I-94.
- iii. Install a monitoring well cluster in the Nancy Drive/MW-14d area, to define the extent of groundwater contamination from surface to bedrock, with final placement of the cluster to be determined after the Wagner Road/I-94 well cluster is installed or as otherwise agreed.
- iv. Install a monitoring well screened to monitor the deep (Unit E) zone near/at MW-125, with location to be approved by MDNRE. PLS will vertically profile every ten feet throughout the deep (Unit E) saturated interval.

Defendant shall promptly provide the data/results from the investigation to the MDNRE so that the MDNRE receives them prior to Defendant's submission of the Monitoring Plan described in Subsection V.B.2.d, below. MDNRE reserves the right to request the installation of additional borings/monitoring wells, if the totality of the data from the wells to be installed indicate that the horizontal extent of groundwater contamination has not been completely defined.

d. Compliance Monitoring Well Network/Performance Monitoring Plan. Within 15 days of completing the investigation described in Subsection V.B.2.c, above, Defendant shall submit a Monitoring Plan, including Defendant's analysis of the data obtained during the investigation for review and approval by the MDNRE. The Monitoring Plan shall include the collection of data from a compliance monitoring well network sufficient to verify the effectiveness of the Western Area System in meeting the Western Area objective set forth in Section V.B.1. The locations and/or number of the compliance monitoring wells for the Monitoring Plan will be determined based on the data obtained from the investigation Defendant shall conduct pursuant to Section V.B.2.c. The MDNRE shall approve the Monitoring Plan, submit to Defendant changes in the Monitoring Plan that would result in approval, or deny the Monitoring Plan within 35 days of receiving the Monitoring Plan. Defendant shall either implement the MDNRE-approved Monitoring Plan, including any changes required by MDNRE, or initiate dispute resolution pursuant to Section XVI of this Consent Judgment. Defendant shall implement the MDNRE (or Court)-approved Monitoring Plan to verify the effectiveness of the Western Area System in meeting the Western Area objective. Defendant shall continue to implement the current MDNRE-approved monitoring plan(s) until MDNRE approves the Monitoring Plan required by this Section. The monitoring program shall be continued until terminated pursuant to Section V.E.

e. Property Restrictions. The Defendant shall have property use restrictions that are sufficient to prevent unacceptable exposures in place for any properties affected by Soil Contamination or Groundwater Contamination before completely terminating extraction in the Western Area.

3. Internal Plume Characterization. Additional definition within the plume and/or characterization of source areas, except as may be required under Section VI of this Consent Judgment, is not necessary based on the additional monitoring wells to be installed as provided in Section V.B.2.c. MDNRE reserves the right to petition the Court to require such work if there are unexpected findings that MDNRE determines warrants additional characterization.

C. Little Lake Area System

1. Little Lake Area System Non-Expansion Objective. The objective of the Little Lake Area System is to prevent expansion of the horizontal extent of any groundwater contamination located in this area.

2. Response Activities. Defendant shall implement some form of active remediation in this area until the termination criterion is reached under Section V.D.1.d. or appropriate land or resource use restrictions on the affected property(ies) approved by the MDNRE are in place. Defendant shall continue its batch purging program from the extraction well located on the Ann Arbor Cleaning Supply property pursuant to MDNRE-approved plans unless some other form of active remediation is approved by the MDNRE. Defendant may resubmit a proposal to temporarily reduce the frequency of the batch purging of this well so that the effects of batch purging can be evaluated. Defendant shall also have the option of obtaining appropriate land use or resource use restrictions on the affected property(ies) as an alternative to active remediation in this area, conditioned on MDNRE's approval.

3. Monitoring Plan. Within 45 days of entry of this Third Amendment, Defendant shall submit to the MDNRE for approval under Section X of this Consent Judgment a revised Monitoring Plan that identifies which of the existing monitoring wells will be used as compliance wells to verify the effectiveness of the Little Lake Area System in meeting the non-expansion objective of Section V.C.1. Defendant shall continue to implement the current MDNRE-approved monitoring plan until MDNRE approves the Monitoring Plan required by this Section. If a form of active remediation other than batch purging or land use or resource use restrictions are approved by the MDNRE, Defendant shall submit a revised monitoring plan, modified as necessary to verify the effectiveness of such response activities.

The monitoring plan shall be continued until terminated pursuant to Section V.E.

D. Termination of Groundwater Extraction Systems

1. Defendant may only terminate the Groundwater Extraction Systems listed below as provided below:

a. Termination Criteria for LB Wells/Wagner Road Wells. Except as otherwise provided pursuant to Section V.D.2, Defendant may only significantly reduce or terminate operation of the LB Wells and the Wagner Road Wells as provided in Sections V.A.2.f. and V.A.7., respectively.

b. Termination Criteria for TW-19. Except as otherwise provided pursuant to Section V.D.2, Defendant shall maintain TW-19 in an operable condition and operate as needed to meet the groundwater-surface water interface criterion containment objective until all approved monitoring wells upgradient of Maple Road are below the groundwater surface water interface criterion for six consecutive months or until Defendant can establish to the satisfaction of MDNRE that additional purging from TW-19 is no longer necessary to satisfy the containment objective at this location. If Defendant requests to decommission TW-19,



Defendant's request must be made in writing for review and approval pursuant to Section X of the Consent Judgment. The request must include all supporting documentation demonstrating compliance with the termination criteria. Defendant may initiate dispute resolution pursuant to Section XVI of this Consent Judgment if the DNRE does not approve Defendant's request. Defendant may decommission TW-19 upon: (i) receipt of notice of approval from MDNRE; or (ii) receipt of notice of a final decision approving termination pursuant to dispute resolution procedures of Section XVI of this Consent Judgment. Defendant shall not permanently plug TW-19 until completion of the post-termination monitoring pursuant to Section V.E.1.b.

c. Termination Criteria for Non-Expansion Objective for Western Area. Except as otherwise provided pursuant to Section V.D.2, and subject to Section V.B.1., Defendant shall not terminate all groundwater extraction in the Western Area until:

i. Defendant can establish to Plaintiffs' satisfaction that groundwater extraction is no longer necessary to prevent the expansion of groundwater contamination prohibited under Section V.B.1. Defendant's demonstration shall also establish that any remaining 1,4-dioxane contamination in the Marshy and Soil Systems will not cause any prohibited expansion of groundwater contamination; and

ii. Defendant has the land use or resource use restrictions described in Section V.B.2.e. in place.

Defendant's request to terminate extraction in the Western Area must be made in writing for review and approval pursuant to Section X of the Consent Judgment. The request must include all supporting documentation demonstrating compliance with the termination criteria. Defendant may initiate dispute resolution pursuant to Section XVI of the Consent Judgment if the MDNRE does not approve the Defendant's request/demonstration. Defendant may terminate Western Area

groundwater extraction upon: (i) receipt of notice of approval from MDNRE; or (ii) receipt of notice of a final decision approving termination pursuant to dispute resolution procedures of Section XVI of this Consent Judgment.

d. Termination Criteria for Little Lake Area Well (a/ k/a Ann Arbor Cleaning Supply Well). Except as otherwise provided pursuant to Section V.D.2., Defendant shall continue to operate the Ann Arbor Supply Well on a batch purging basis (or implement another form of MDNRE-approved active remediation) until six consecutive monthly tests of samples from the extraction well and associated monitoring wells, fail to detect the presence of groundwater contamination or until appropriate land use restrictions are placed on the affected property(ies).

2. The termination criteria provided in Section V.D.1. may be modified as follows:

e. At any time two years after entry of this Consent Judgment, Defendant may propose to the MDNR that the termination criteria be modified based upon either or both of the following:

i. a change in legally applicable or relevant and appropriate regulatory criteria since the entry of this Consent Judgment; for purposes of this subparagraph, "regulatory criteria" shall mean any promulgated standard criterion or limitation under federal or state environmental law specifically applicable to 1,4-dioxane; or

ii. scientific evidence newly released since the entry of this Consent Judgment, which, in combination with the existing scientific evidence, establishes that different termination criteria for 1,4-dioxane are appropriate and will assure protection of public health, safety, welfare, the environment, and natural resources.

f. Defendant shall submit any such proposal in writing, together with supporting documentation, to the MDNR for review.

g. If the Parties agree to a proposed modification, the agreement shall be made by written Stipulation filed with the Court pursuant to Section XXIV of this Judgment.

h. If MDNR disapproves the proposed modification, Defendant may invoke the Dispute Resolution procedures contained in Section XVI of this Consent Judgment. Alternatively, if MDNR disapproves a proposed modification, Defendant and Plaintiffs may agree to resolve the dispute pursuant to subparagraph V.D.3.

3. If the parties do not agree to a proposed modification, Defendant and Plaintiffs may prepare a list of the items of difference to be submitted to a scientific advisory panel for review and recommendations. The scientific advisory panel shall be comprised of three persons with scientific expertise in the discipline(s) relevant to the items of difference. No member of the panel may be a person who has been employed or retained by either party, except persons compensated solely for providing peer review of the Hartung Report, in connection with the subject of this litigation.

a. If this procedure is invoked, each party shall, within 14 days, select one member of the panel. Those two members of the panel shall select the third member. Defendant shall, within 28 days after this procedure is invoked, establish a fund of at least \$10,000.00, from which each member of the panel shall be paid reasonable compensation for their services, including actual and necessary expenses. If the parties do not agree concerning the qualifications, eligibility, or compensation of panel members, they may invoke the Dispute Resolution procedures contained in Section XVI of this Consent Judgment.

b. Within a reasonable period of time after selection of all panel members, the panel shall confer and establish a schedule for acceptance of submissions from the parties completing review and making recommendations on the items of difference.

c. The scientific advisory panel shall make its recommendations concerning resolution of the items of difference to the parties. If both parties accept those recommendations, the termination criteria shall be modified in accordance with such recommendations. If the parties disagree with the recommendations, the MDNR's proposed resolution of the dispute shall be final unless Defendant invokes the procedures for judicial Dispute Resolution as provided in Section XVI of the Judgment. The recommendation of the scientific advisory panel and any related documents shall be submitted to the Court as part of the record to be considered by the Court in resolving the dispute.

E. Post-Termination Monitoring

1. Eastern Area

a. Prohibition Zone Containment Objective. Except as otherwise provided pursuant to Section V.D.2, Defendant shall continue to monitor the groundwater contamination as it migrates within the Prohibition Zone and Expanded Prohibition Zone until all approved monitoring wells are below 85 ug/l or such other applicable criterion for 1,4-dioxane for six consecutive months, or Defendant can establish to MDNRE's satisfaction that continued monitoring is not necessary to satisfy the Prohibition Zone containment objective. Defendant's request to terminate monitoring must be made in writing for review and approval pursuant to Section X of the Consent Judgment. Defendant may initiate dispute resolution pursuant to Section XVI of this Consent Judgment if the MDNRE does not approve its termination request.

b. Groundwater/Surface Water Containment Objective. Except as provided in Section V.E.1.a., for Prohibition Zone monitoring wells, post-termination monitoring

is required for Eastern Area wells for a minimum of 10 years after purging is terminated under Section V.D.1.b. with cessation subject to MDNRE approval. Defendant's request to terminate monitoring must be made in writing for review and approval pursuant to Section X of the Consent Judgment. Defendant may initiate dispute resolution pursuant to Section XVI of this Consent Judgment if the MDNRE does not approve its termination request.

c. Maple Road Extraction. If Defendant has decommissioned TW-19 based on monitoring well results showing that upgradient monitoring wells are below the groundwater/surface water interface criterion (rather than a demonstration) as provided in Section V.D.1.b and the monitoring conducted pursuant to Section V.E.1.b. reveal that the termination criterion is no longer being met, Defendant shall immediately notify MDNRE and collect a second sample within 14 days of such finding. If any two consecutive samples are found at or above the termination criterion, then Defendant shall take the steps necessary to put TW-19 in an operable condition and operate the well as necessary to satisfy the groundwater/surface interface water containment objective unless it can establish to Plaintiffs' satisfaction that such actions are not necessary to meet the groundwater/surface water interface containment objective.

2. Western Area. Post-termination monitoring will be required for a minimum of ten years after termination of extraction with cessation subject to MDNRE approval. Except as otherwise provided pursuant to Section V.D.2, Defendant shall continue to monitor the groundwater in accordance with approved monitoring plan(s), to verify that it remains in compliance with the no expansion performance objective set forth in Section V.B.1. If any violation is detected, Defendant shall immediately notify MDNRE and take whatever steps are necessary to comply with the requirements of Section V.B.1.

3. Little Lake Area System. Post-termination monitoring will be required for a minimum of ten years after termination of active remediation in the Little Lake Area with cessation subject to MDNRE approval. Defendant shall continue to monitor the Ann Arbor Cleaning Supply extraction well and/or associated monitoring wells, in accordance with approved monitoring plans to verify that:

a. the concentration of 1,4-dioxane in the groundwater does not exceed the termination criterion. If such post-termination monitoring reveals the presence of 1,4-dioxane in excess of the termination criterion, Defendant shall immediately notify MDNRE and shall collect a second sample within 14 days of such finding. If any two consecutive samples are found at or above the termination criterion, Defendant shall immediately restart the previously-approved method of active remediation, unless Defendant has obtained appropriate land use or resource use restrictions on the affected property(ies) pursuant to Section V.C.2, (in which case subsection b, below shall apply); or

b. 1,4-dioxane in excess of the termination criterion is not migrating outside the MDNRE-approved area of land use or resource use restrictions.

## **VI. GSI PROPERTY REMEDIATION**

Defendant shall design, install, operate, and maintain the systems described below to control, remove, and treat Soil Contamination at the GSI Property and remove and treat groundwater from the Marshy Area located north of former Ponds I and II as necessary to: (a) prevent the migration of 1,4-dioxane from contaminated soils into any aquifer in concentrations that cause the expansion of groundwater contamination in violation of Section V.B.1 of this Consent Judgment; (b) prevent venting of groundwater into Honey Creek Tributary with 1,4-dioxane in quantities that cause the concentration of 1,4-dioxane at the groundwater-surface water interface of the Tributary to exceed 2800 ug/l; and (c) prevent venting of groundwater to

Third Sister Lake with 1,4-dioxane in quantities that cause of the concentration of 1,4-dioxane at the groundwater-surface water interface of the Lake to exceed 2800 ug/l. Defendant also shall implement a monitoring plan to verify the effectiveness of these systems.

A. Marshy Area System (hereinafter "Marshy Area System")

1. Objectives. The objectives of this System are to: (a) prevent expansion of groundwater contamination prohibited under Section V.B.1.; and (b) prevent the discharge of contaminated groundwater from the Marshy Area into the Honey Creek Tributary in quantities that cause the concentration of 1,4-dioxane at the groundwater-surface water interface of the Tributary to exceed 2800 ug/l.

2. Response Activities. Defendant shall operate the Marshy Area System described in Defendant's May 5, 2000 Final Design and Effectiveness Monitoring Plan, as subsequently modified and approved by the MDNRE as necessary to meet the objectives of the Marshy Area System until its operation may be terminated under Section VI.D. of this Consent Judgment.

3. Monitoring. Defendant shall implement the MDNRE-approved monitoring plan to verify the effectiveness of the Marshy Area System in meeting the requirements of this Consent Judgment. The monitoring plan shall be continued until terminated pursuant to Section VI.D. of this Consent Judgment.

B. Spray Irrigation Field

1. Objectives. The objectives of this program shall be to meet the overall objective of Section VI upon completion of the program and to prevent the discharge of groundwater contamination into Third Sister Lake in quantities which cause the concentration of 1,4-dioxane at the groundwater-surface water interface of Third Sister Lake to exceed 2800 ug/l.

2. Remedial Investigation. Defendant shall, no later than 180 days after the effective date, submit to MDNR for review and approval a work plan for determining the distribution of soil contamination in the former spray irrigation area. Soil characteristics for the area may be extrapolated from results of samples taken from representative spray head locations.

3. Structures in the Spray Field. The following structures have been constructed over portions of the former spray irrigation area: (a) the Defendant's warehouse; (b) the parking area south of the Defendant's warehouse; and (c) the parking lot between the Medical Device Division Building and the Defendant's warehouse. These structures are identified in Attachment D. With respect to these structures, during such time as they are kept in good maintenance and repair, the soils beneath such structures need not be sampled nor directly addressed in the soils systems remediation plan. In the event that the structures are not kept in good maintenance or repair, or are scheduled to be replaced or demolished, Defendant shall notify MDNR of such a circumstance, and take the following actions:

a. Defendant shall, within 21 days after notification, submit to MDNR for approval a work plan for investigating the extent of contamination (if any) of the soils beneath the structure, along with a schedule for implementation of the work plan.

b. Within 14 days after approval of the work plan by MDNR, Defendant shall implement the work plan and submit a report of the results to MDNR within the time specified in the approved schedule.

c. If Soil Contamination is identified in any of the areas investigated, Defendant shall submit, together with the report required in Section VI.B.3.b., an analysis of whether such Soil Contamination will cause the expansion of Groundwater Contamination prohibited under Section V.B.1. or venting of groundwater to Third Sister Lake with 1,4-dioxane



in quantities that cause of the concentration of 1,4-dioxane at the groundwater-surface water interface of the Lake to exceed 2800 ug/l. If either will occur, Defendant shall submit a remediation plan for that area that achieves the overall objectives of Section VI. The plan shall include a proposed schedule for implementation. The remediation system shall be installed, operated, and terminated in accordance with the approved plan.

4. Installation, Operation, and Monitoring. Upon approval by MDNR, Defendant shall install, operate, maintain, and monitor the Spray Irrigation Field System in accordance with the approved plans and the termination criteria established in Section VI.D.

C. Soils System

1. Objectives. The objectives of this program are to: (a) evaluate the necessity, feasibility and effectiveness of available options for remediation of identified source areas; (b) design and implement remedial systems, if necessary, to achieve the overall objectives of Section VI; and (c) verify the effectiveness of those systems.

2. Soils Remediation Plan. Defendant shall, no later than November 30, 1996 submit to MDEQ for review and approval a revised soils remediation plan for addressing identified areas of soil contamination. The areas to be addressed include the burn pit; the former Pond I area; the former Pond II area; the former Lift Station Area; and Pond III.

The Defendant's proposal must attain the overall objectives of Section VI.

3. Design. Defendant shall, not later than 60 days after: (a) the MDNR's decision approving the proposed remedial alternative(s); or (b) the final decision in Dispute Resolution pursuant to Section XVI of the Consent Judgment, submit the following to the MDNR for review and approval: Defendant's proposed design of each selected remedial system, a time schedule for implementation of the system, an operating and maintenance plan, and effectiveness monitoring plan.

4. Installation, Operation, and Monitoring. Upon approval by MDNR, Defendant shall install, operate, maintain, and monitor the systems in accordance with the approved plans, and the termination criteria established in Section VI.D. of the Consent Judgment.

D. Termination Criteria for GSI Property Remediation

1. Defendant shall continue to operate each of the GSI Property Remedial Systems, including the Marshy Area System until Defendant can make a demonstration to Plaintiffs' satisfaction that 1,4-dioxane remaining in any of the areas addressed would not cause:

a) any expansion of groundwater contamination in the Western Area as prohibited in Section V.B.1; or b) venting of groundwater into the Honey Creek Tributary or to the Third Sister Lake in quantities that cause the concentration of 1,4-dioxane at the groundwater-surface water interface of the Tributary or Lake to exceed 2800 ug/l. The demonstration described in this Section must be made in writing for review and approval by MDNRE pursuant to Section X of the Consent Judgment, and approved by MDNRE before Defendant terminates all groundwater extraction in the Western Area. Defendant may initiate dispute resolution pursuant to Section XVI of this Consent Judgment if MDNRE does not approve Defendant's demonstration. These Systems shall also be subject to the same post-termination monitoring as the Western Area System, described in Section V.E.2.

2. The termination criteria provided in Section VI.D. may be modified in the same manner as specified in Sections V.D.2. and V.D.3.

**VII. COMPLIANCE WITH OTHER LAWS AND PERMITS**

A. Defendant shall undertake all activities pursuant to this Consent Judgment in accordance with the requirements of all applicable laws, regulations, and permits.

B. Defendant shall apply for all permits necessary for implementation of the Consent Judgment including, without limitation, surface water discharge permit(s) and air discharge permit(s).

C. Defendant shall include in all contracts entered into by the Defendant for Remedial Action required under this Consent Judgment (and shall require that any contractor include in all subcontract(s) , a provision stating that such contractors and subcontractors, including their agents and employees, shall perform all activities required by such contracts or subcontracts in compliance with and all applicable laws, regulations, and permits. Defendant shall provide a copy of relevant approved workplans to any such contractor or subcontractor.

D. The Parties agree to provide reasonable cooperation and assistance to the Defendant in obtaining necessary approvals and permits for Remedial Action. Plaintiffs shall not unreasonably withhold or delay any required approvals or permits for Defendant's performance of the Remedial Action. Plaintiffs expressly acknowledge that one or more of the following permits and approvals may be necessary for Remedial Action:

1. NPDES Permit No. MI-0048453;
2. An Air Permit for discharges of contaminants to the atmosphere for vapor extraction systems, if such systems are part of the remedial design;
3. A Wetlands Permit if necessary for construction of the Marshy Area System or the construction of facilities as part of the Core or Western Systems;
4. An Industrial User's Permit to be issued by the City of Ann Arbor for use of the sewer to dispose of treated or untreated purged groundwater. Plaintiffs have no objection to receipt by the Ann Arbor Wastewater Treatment Plant of the purged groundwater extracted pursuant to the terms and conditions of this Judgment, and acknowledge that receipt of the

purged groundwater would not necessitate any change in current and proposed residual management programs of the Ann Arbor Wastewater Treatment Plant;

5. Permit(s) or permit exemptions to be issued by the MDNRE to authorize the reinjection of purged and treated groundwater in the Eastern Area, Western Area, and Little Lake Area;

6. Surface water discharge permit(s) for discharge into surface waters in the Little Lake System Area, if necessary;

7. Approval of the City of Ann Arbor and the Washtenaw County Drain Commissioner to use storm drains for the remedial programs; or

8. A permit for the use of Defendant's deep well for injection of purged groundwater from the remedial systems required under this Consent Judgment.

#### **VIII. SAMPLING AND ANALYSIS**

Defendant shall make available to Plaintiffs the results of all sampling, tests, and/or other data generated in the performance or monitoring of any requirement under this Consent Judgment. Sampling data generated consistent with this Consent Judgment shall be admissible in evidence in any proceeding related to enforcement of this Judgment without waiver by any Party of any objection as to weight or relevance. Plaintiffs and/or their authorized representatives, at their discretion, may take split or duplicate samples and observe the sampling event. Plaintiffs shall make available to Defendant the results of all sampling, tests, and/or other data generated in the performance or monitoring of any requirement under this Consent Judgment. Defendant will provide Plaintiffs with reasonable notice of changes in the schedule of data collection activities included in the progress reports submitted pursuant to Section XII.

#### **IX. ACCESS**

A. From the effective date of this Consent Judgment, the Plaintiffs, their authorized employees, agents, representatives, contractors, and consultants, upon presentation of proper identification, shall have the right at all reasonable times to enter the Site and any property to which access is required for the implementation of this Consent Judgment, to the extent access to the property is owned, controlled by, or available to the Defendant, for the purpose of conducting any activity authorized by this Consent Judgment, including, but not limited to:

1. Monitoring of the Remedial Action or any other activities taking place pursuant to this Consent Judgment on the property;
2. Verification of any data or information submitted to the Plaintiffs;
3. Conduct of investigations related to contamination at the Site;
4. Collection of samples;
5. Assessment of the need for, or planning and implementing of, Response Actions at the Site; and
6. Inspection and copying of non-privileged documents including records, operating logs, contracts, or other documents required to assess Defendant's compliance with this Consent Judgment.

All Parties with access to the Site or other property pursuant to this paragraph shall comply with all applicable health and safety laws and regulations.

B. To the extent that the Site or any other area where Remedial Action is to be performed by the Defendant under this Consent Judgment is owned or controlled by persons other than the Defendant, Defendant shall use its best efforts to secure from such persons access for Defendant, Plaintiffs, and their authorized employees, agents, representatives, contractors, and consultants. Defendant shall provide Plaintiffs with a copy of each access agreement secured

pursuant to this paragraph. For purposes of this Paragraph, "best efforts" includes, but is not limited to, seeking judicial assistance to secure such access pursuant to MCL 324.20135a.

**X. APPROVALS OF SUBMISSIONS**

Upon receipt of any plan, report, or other items that is required to be submitted for approval pursuant to this Consent Judgment, as soon as practicable, but in no event later than 56 days after receipt of such submission, except for a feasibility analysis or plan that proposes a risk based cleanup or requires public comment submitted pursuant to Section V.A.2.b., of this Consent Judgment, the Plaintiff will: (1) approve the submission; or (2) submit to Defendant changes in the submission that would result in approval of the submission. Plaintiff will (1) approve a Feasibility Study or plan that proposes a risk based cleanup or a remedy that requires public comment; or (2) submit to Defendant changes in such submittal that would result in approval in the time provided under Part 201 of the Natural Resources and Environmental Protection Act, as amended, [MCL 324.20101 et seq.]. If Plaintiffs do not respond within 56 days, or 180 days, respectively, Defendant may submit the matter to Dispute Resolution pursuant to Section XVI. Upon receipt of a notice of approval or changes from the Plaintiffs, Defendant shall proceed to take any action required by the plan, report or other item, as approved or as may be modified to address the deficiencies identified by Plaintiffs. If Defendant does not accept the changes proposed by Plaintiffs, Defendant may submit the matter to Dispute Resolution pursuant to Section XVI.

**XI. PROJECT COORDINATORS**

A. Plaintiffs designate Sybil Kolon as Plaintiffs' Project Coordinator. Defendant designates Farsad Fotouhi, Vice President of Corporate Environmental Engineering, as Defendant's Project Coordinator. Defendant's Project Coordinator shall have primary responsibility for implementation of the Remedial Action at the Site. Plaintiffs' Project

Coordinator will be the primary designated representative for Plaintiffs with respect to implementation of the Remedial Action at the Site. All communication between Defendant and Plaintiffs, including all documents, reports, approvals, other submissions and correspondence concerning the activities performed pursuant to the terms and conditions of this Consent Judgment, shall be directed through the Project Coordinators. If any Party changes its designated Project Coordinator, that Party shall provide the name, address, and telephone number of the successor in writing to the other Party seven days prior to the date on which the change is to be effective. This paragraph does not relieve Defendant from other reporting obligations under the law.

B. Plaintiffs may designate other authorized representatives, employees, contractors, and consultants to observe and monitor the progress of any activity undertaken pursuant to this Consent Judgment. Plaintiffs' Project Coordinator shall provide Defendant's Project Coordinator with the names, addresses, telephone numbers, positions, and responsibilities of any person designated pursuant to this section.

## **XII. PROGRESS REPORTS**

Defendant shall provide to Plaintiffs written quarterly progress reports that shall: (1) describe the actions which have been taken toward achieving compliance with this Consent Judgment during the previous three months; (2) describe data collection and activities scheduled for the next three months; and (3) include all results of sampling and tests and other data received by the Defendant, its consultants, engineers, or agents during the previous three months relating to Remedial Action performed pursuant to this Consent Judgment. Defendant shall submit the first quarterly report to MDNR within 120 days after entry of this Consent Judgment, and by the 30th day of the month following each quarterly period thereafter, as feasible, until termination of this Consent Judgment as provided in Section XXV.

### **XIII. RESTRICTIONS ON ALIENATION**

A. Defendant shall not sell, lease, or alienate the GSI Property until: (1) it places an MDNRE approved land use or resource use restrictions on the affected portion(s) of the GSI Property; and (2) any purchaser, lessee, or grantee provides to Plaintiffs its written agreement providing that the purchaser, lessee, or grantee will not interfere with any term or condition of this Consent Judgment. Notwithstanding any purchase, lease, or grant, Defendant shall remain obligated to comply with all terms and conditions of this Consent Judgment.

B. Any deed, title, or other instrument of conveyance regarding the GSI Property shall contain a notice that Defendant's Property is the subject of this Consent Judgment, setting forth the caption of the case, the case number, and the court having jurisdiction herein.

### **XIV. FORCE MAJEURE**

Any delay attributable to a Force Majeure shall not be deemed a violation of Defendant's obligations under this Consent Judgment.

A. "Force Majeure" is defined as an occurrence or nonoccurrence arising from causes beyond the control of Defendant or of any entity controlled by the Defendant performing Remedial Action, such as Defendant's employees, contractors, and subcontractors. Such occurrence or nonoccurrence includes, but is not limited to: (1) an Act of God; (2) untimely review of permit applications or submissions; (3) acts or omissions of third parties for which Defendant is not responsible; (4) insolvency of any vendor, contractor, or subcontractor retained by Defendant as part of implementation of this Judgment; and (5) delay in obtaining necessary access agreements under Section IX that could not have been avoided or overcome by due diligence "Force Majeure" does not include unanticipated or increased costs, changed financial circumstances, or nonattainment of the treatment and termination standards set forth in Sections V and VI.



B. When circumstances occur that Defendant believes constitute Force Majeure, Defendant shall notify the MDNR by telephone of the circumstances within 48 hours after Defendant first believes those circumstances to apply. Within 14 working days after Defendant first believes those circumstances to apply, Defendant shall supply to the MDNR, in writing, an explanation of the cause(s) of any actual or expected delay, the anticipated duration of the delay, the measures taken and the measures to be taken by Defendant to avoid, minimize, or overcome the delay, and the timetable for implementation of such measures. Failure of Defendant to comply with the written notice provisions of this paragraph shall constitute a waiver of Defendant's right to assert a claim of Force Majeure with respect to the circumstances in question.

C. A determination by the MDNR that an event does not constitute Majeure, that a delay was not caused by Force, or that the period of delay was not necessary to compensate for Force Majeure may be subject to Dispute Resolution under Section XVI of this Judgment.

D. The MDNR shall respond, in writing, to any request by Defendant for a Force Majeure extension within 30 days of receipt of the Defendant's request. If the MDNR does not respond within that time period, Defendant's request shall be deemed granted. If the MDNR agrees that a delay is or was caused by Force Majeure, Defendant's delays shall be excused, stipulated penalties shall not accrue, and the MDNR shall provide Defendant such additional time as may be necessary to compensate for the Force Majeure event.

E. Delay in achievement of any obligation established by the Consent Judgment shall not automatically justify or excuse delay in achievement of any subsequent obligation unless the subsequent obligation automatically follows from the delayed obligation.

#### **XV. REVOCATION OR MODIFICATION OF LICENSES OR PERMITS**

Any delay attributable to the revocation or modification of licenses or permits obtained by Defendant to implement remediation actions as set forth in this Consent Judgment shall not be deemed a violation of Defendant's obligations under this Consent Judgment, provided that such revocation or modification arises from causes beyond the control of Defendant or of any entity controlled by the Defendant performing Remedial Action, such as Defendant's employees, contractors, and subcontractors.

A. Licenses or permits that may need to be obtained or modified by Defendant to implement the Remedial Actions are those specified in Section VII.D. and licenses, easements, and other agreements for access to property or rights of way on property necessary for the installation of remedial systems required by this Consent Judgment.

B. A revocation or modification of a license or permit within the meaning of this section means withdrawal of permission, denial of permission, a limitation or a change in license or permit conditions that delays the implementation of all or part of a remedial system. Revocation or modification due to Defendant's violation of a license or permit (or any conditions of a license or permit) shall not constitute a revocation or modification covered by this section.

C. When circumstances occur that Defendant believes constitute revocation or modification of a license or permit, Defendant shall notify the MDNR by telephone of the circumstances within 48 hours after Defendant first believes those circumstances to apply. Within 14 working days after Defendant first believes those circumstances to apply, Defendant shall supply to the MDNR, in writing, an explanation of the cause(s) of any actual or expected delay, the anticipated duration of the delay, the measures taken and the measures to be taken by Defendant to avoid, minimize, or overcome the delay, and the timetable for implementation of such measures. Failure of Defendant to comply with the written notice provisions of this

paragraph shall constitute a waiver of Defendant's right to assert a claim of revocation or modification of a license or permit with respect to the circumstances in question.

D. A determination by the MDNR that an event does not constitute revocation or modification of a license or permit, that a delay was not caused by revocation or modification of a license or permit, or that the period of delay was not necessary to compensate for revocation or modification of a license or permit may be subject to Dispute Resolution under Section XVI of this Consent Judgment.

E. The MDNR shall respond, in writing, to any request by Defendant for a revocation or modification of a license or permit extension within 30 days of receipt of the Defendant's request. If the MDNR does not respond within that time period, Defendant's request shall be deemed granted. If the MDNR agrees that a delay is or was caused by revocation or modification of a license or permit, Defendant's delays shall be excused, stipulated penalties shall not accrue, and the MDNR shall provide Defendant such additional time as may be necessary to compensate for the I revocation or modification of a license or permit.

F. Delay in achievement of any obligation established by the Consent Judgment shall not automatically justify or excuse delay in achievement of any subsequent obligation unless the subsequent obligation automatically follows from the delayed obligation.

#### **XVI. DISPUTE RESOLUTION**

A. Except as provided in Sections V.A.2.f., V.A.7., and V.D.1.a., the dispute resolution procedures of this Section shall be the exclusive mechanism to resolve disputes arising under this Consent Judgment and shall apply to all provisions of this Consent Judgment, whether or not particular provisions of the Consent Judgment in question make reference to the dispute resolution provisions of this Section. Any dispute that arises under this Consent Judgment initially shall be the subject of informal negotiations between the Parties. The period of

negotiations shall not exceed ten working days from the date of written notice by any Party that a dispute has arisen. This period may be extended or shortened by agreement of the Parties.

B. Immediately upon expiration of the informal negotiation period (or sooner if upon agreement of the parties), the MDNR shall provide to Defendant a written statement setting forth the MDNR's proposed resolution of the dispute. Such resolution shall be final unless, within 15 days after receipt of the MDNR's proposed resolution (clearly identified as such under this Section), Defendant files a petition for resolution with the Washtenaw County Circuit Court setting forth the matter in dispute, the efforts made by the Parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of the Consent Judgment.

C. Within ten days of the filing of the petition, Plaintiffs may file a response to the petition, and unless a dispute arises from the alleged failure of MDNR to timely make a decision, MDNR will submit to the Court all documents containing information related to the matters in dispute, including documents provided to MDNR by Defendant. In the event of a dispute arising from the alleged failure of MDNR to timely make a decision, within ten days of filing of the petition, each party shall submit to the Court correspondence, reports, affidavits, maps, diagrams, and other documents setting forth facts pertaining to the matters in dispute. Those documents and this Consent Judgment shall comprise the record upon which the Court shall resolve the dispute. Additional evidence may be taken by the Court on its own motion or at the request of either party if the Court finds that the record is incomplete or inadequate. Review of the petition shall be conducted by the Court and shall be confined to the record. The review shall be independent of any factual or legal conclusions made by the Court prior to the date of entry of the Consent Judgment.

D. The Court shall uphold the decision of MDNR on the issue in dispute unless the Court determines that the decision is any of the following:

1. Inconsistent with this Consent Judgment;
2. Not supported by competent, material, and substantial evidence on the whole record;
3. Arbitrary, capricious, or clearly an abuse or unwarranted exercise of discretion; and
4. Affected by other substantial and material error of law;

E. The filing of a petition for resolution of a dispute shall not by itself extend or postpone any obligation of Defendant under this Consent Judgment, provided, however, that payment of stipulated penalties with respect to the disputed matter shall be stayed pending resolution of the dispute. Notwithstanding the stay of payment, stipulated penalties shall accrue as provided in Section XVII. Stipulated penalties that have accrued with respect to the matter in dispute shall not be assessed by the Court and shall be dissolved if Defendant prevails on the matter. The Court may also direct that stipulated penalties shall not be assessed and paid as provided in Section XVII upon a determination that there was a substantial basis for Defendant's position on the disputed matter.

**XVII. STIPULATED PENALTIES**

A. Except as otherwise provided, if Defendant fails or refuses to comply with any term or condition in Sections IV, V, VI, VII, or VIII, or with any plan, requirement, or schedule established pursuant to those Sections, then Defendant shall pay stipulated penalties in the following amounts for each working day for every failure or refusal to comply or conform:

<u>Period of Delay</u>	<u>Penalty Per Violation Per Day</u>
1st through 15th Day	\$ 1,000
15th through 30th Day	\$ 1,500

Beyond 30 Days

\$ 2,000

B. Except as otherwise provided if Defendant fails or refuses to comply with any other term or condition of this Consent Judgment, Defendant shall pay to Plaintiffs stipulated penalties of \$500.00 per working day for each and every failure to comply.

C. If Defendant is in violation of this Consent Judgment, Defendant shall notify Plaintiffs of any violation no later than five working days after first becoming aware of such violation, and shall describe the violation.

D. Stipulated penalties shall begin to accrue upon the next day after performance was due or other failure or refusal to comply occurred. Penalties shall continue to accrue until the final day of correction of the noncompliance. Separate penalties shall accrue for each separate failure or refusal to comply with the terms and conditions of this Consent Judgment. Penalties may be waived in whole or in part by Plaintiffs or may be dissolved by the Court pursuant to Section XVII.

E. Stipulated penalties shall be paid no later than 14 working days after receipt by Defendant of a written demand from Plaintiffs. Defendant shall make payment by transmitting a check in the amount due, payable to the "State of Michigan", addressed to the Revenue Control Unit; Finance Section, Administration Division; Michigan Department of Natural Resources and Environment; P.O. Box 30657; Lansing, MI 48909-8157. Via Courier to the Revenue Control Unit; Finance Section, Administration Division; Michigan Department of Natural Resources and Environment; Constitution Hall, 5<sup>th</sup> Floor South Tower; 525 West Allegan Street; Lansing, MI 48933-2125. To ensure proper credit, include the settlement ID - ERD1902 on the payment.

F. Plaintiffs agree that, in the event that an act or omission of Defendant constitutes a violation of this Consent Judgment subject to stipulated penalties and a violation of other

applicable law, Plaintiffs will not impose upon Defendant for that violation both the stipulated penalties provided under this Consent Judgment and the civil penalties permitted under other applicable laws. Plaintiffs reserve the right to pursue any other remedy or remedies to which they may be entitled under this Consent Judgment or any applicable law for any failure or refusal of the Defendant to comply with the requirements of this Consent Judgment.

**XVIII. PLAINTIFFS' COVENANT NOT TO SUE AND RESERVATION OF RIGHTS**

A. Except as otherwise provided in this Consent Judgment, Plaintiffs covenant not to sue or take administrative action for Covered Matters against Defendant, its officers, employees, agents, directors, and any persons acting on its behalf or under its control.

B. "Covered Matters" shall mean any and all claims available to Plaintiffs under federal and state law arising out of the subject matter of the Plaintiffs' Complaint with respect to the following:

1. Claims for injunctive relief to address soil, groundwater, and surface water contamination at or emanating from the GSI Property;
2. Claims for civil penalties and costs;
3. Claims for natural resource damages;
4. Claims for reimbursement of response costs incurred prior to entry of this Consent Judgment or incurred by Plaintiffs for provision of alternative water supplies in the Evergreen Subdivision; and
5. Claims for reimbursement of costs incurred by Plaintiffs for overseeing the implementation of this Consent Judgment.

C. "Covered Matters" does not include:

1. Claims based upon a failure by Defendant to comply with the requirements of this Consent Judgment;

2. Liability for violations of federal or state law which occur during implementation of the Remedial Action; and

3. Liability arising from the disposal, treatment, or handling of any hazardous substance removed from the Site.

D. With respect to liability for alleged past violations of law, this covenant not to sue shall take effect on the effective date of this Consent Judgment. With respect to future liability for performance of response activities required to be performed under this Consent Judgment, the covenant not to sue shall take effect upon issuance by MDNR of the Certificate of Completion in accordance with Section XXV.

E. Notwithstanding any other provision in this Consent Judgment:(1) Plaintiffs reserve the right to institute proceedings in this action or in a new action seeking to require Defendant to perform any additional response activity at the Site; and (2) Plaintiffs reserve the right to institute proceedings in this action or in a new action seeking to reimburse Plaintiffs for response costs incurred by the State of Michigan relating to the Site. Plaintiffs' rights in E.1. and E.2. apply if and only if the following conditions are met:

1. For proceedings prior to Plaintiffs' certification of completion of the Remedial Action concerning the Site,

a. (i) conditions at the Site, previously unknown to the Plaintiffs, are discovered after the entry of this Consent Judgment, (ii) new information previously unknown to Plaintiffs is received after entry of the Consent Judgment, or (iii) MDNRE adopts one or more new, more restrictive cleanup criteria for 1,4-dioxane pursuant to Part 201 of the Natural Resources and Environmental Protection Act (NREPA), MCL 324.20101 et seq., after entry of the Consent Judgment; and



b. these previously unknown conditions, new information, and/or change in criteria indicate that the Remedial Action is not protective of the public health, safety, welfare, and the environment; and

2. For proceedings subsequent to Plaintiffs' certification of completion of the Remedial Action concerning the Site,

a. (i) conditions at the Site, previously unknown to the Plaintiffs, are discovered after certification of completion by Plaintiffs, (ii) new information previously unknown to Plaintiffs is received after certification of completion by Plaintiffs, or (iii) MDNRE adopts one or more new, more restrictive cleanup criteria for 1,4-dioxane pursuant to Part 201 of NREPA, after certification of completion by Plaintiffs; and

b. these previously unknown conditions, new information, and/or change in criteria indicate that the Remedial Action is not protective of the public health, safety, welfare, and the environment.

If Plaintiffs adopt one of more new, more restrictive, cleanup criteria, Plaintiffs' rights in E.1. and E.2. shall also be subject to Defendant's right to seek another site specific criterion(ia) that is protective of public health, safety, welfare, and the environment and/or to argue that Plaintiffs have not made the demonstration(s) required under this Section.

F. Nothing in this Consent Judgment shall in any manner restrict or limit the nature or scope of response actions that may be taken by Plaintiffs in fulfilling their responsibilities under federal and state law, and this Consent Judgment does not release, waive, limit, or impair in any manner the claims, rights, remedies, or defenses of Plaintiffs against a person~ or entity not a party to this Consent Judgment.

G. Except as expressly provided in this Consent Judgment, Plaintiffs reserve all other rights and defenses that they may have, and this Consent Judgment is without prejudice, and shall not be construed to waive, estop, or otherwise diminish Plaintiffs' right to seek other relief with respect to all matters other than Covered Matters.

**XIX. DEFENDANT'S COVENANT NOT TO SUE AND RESERVATION OF RIGHTS**

A. Defendant hereby covenants not to sue and agrees not to assert any claim or cause of action against Plaintiffs or any other agency of the State of Michigan with respect to environmental contamination at the Site or response activities relating to the Site arising from this Consent Judgment.

B. Notwithstanding any other provision in this Consent Judgment, for matters that are not Covered Matters as defined in Section XVIII.E., or in the event that Plaintiffs institute proceedings as allowed under Section XVIII.E., Defendant reserves all other rights, defenses, or counterclaims that it may have with respect to such matters and this Consent Judgment is without prejudice, and shall not be construed to waive, estop, or otherwise diminish Defendant's right to seek other relief and to assert any other rights and defenses with respect to such other matters.

C. Nothing in this Consent Judgment shall in any way impair Defendant's rights, claims, or defenses with respect to any person not a party to this Consent Judgment.

**XX. INDEMNIFICATION, INSURANCE AND FINANCIAL ASSURANCE**

A. Defendant shall indemnify and save and hold harmless the State of Michigan and its departments, agencies, officials, agents, employees, contractors, and representatives from any and all claims or causes of action arising from, or on account of, acts or omissions of Defendant, its officers, employees, agents, and any persons acting on its behalf or under its control in carrying out Remedial Action pursuant to this Consent Judgment. Plaintiffs shall not be held out as a party to any contract entered into by or on behalf of Defendant in carrying out activities

pursuant to this Consent Judgment. Neither the Defendant nor any contractor shall be considered an agent of Plaintiffs. Defendant shall not indemnify or save and hold harmless Plaintiffs from their own negligence pursuant to this paragraph.

B. Prior to commencing any Remedial Action on the Gelman Property, Defendant shall secure, and shall maintain for the duration of the Remedial Action, comprehensive general liability insurance with limits of \$1,000,000.00, combined single limit, naming as an additional insured the State of Michigan. If Defendant demonstrates by evidence satisfactory to Plaintiffs that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering the same risks but in a lesser amount, then with respect to that contractor or subcontractor, Defendant need provide only that portion, if any, of the insurance described above that is not maintained by the contractor or subcontractor.

C. Financial Assurance

1. Defendant shall be responsible for providing and maintaining financial assurance in a mechanism approved by MDNRE in an amount sufficient to cover the estimated cost to assure performance of the response activities required, to meet, the remedial objectives of this Consent Judgment including, but not limited to investigation, monitoring, operation and maintenance, and other costs (collectively referred to as “Long-Term Costs”). Defendant shall continuously maintain a financial assurance mechanism (FAM) until MDNRE’s Remediation Division (RD) Chief or his or her authorized representative notifies it in writing that it is no longer required to maintain a FAM. Defendant shall provide a FAM for MDNRE’s approval within 45 days of entry of this Third Amendment.

2. Defendant may satisfy the FAM requirement set forth in this Section by satisfying the requirements of the financial test and/or corporate guarantee, attached as

Attachment H, as may be amended by the Parties or by the Court upon the motion of either Party (Financial Test). Defendant shall be responsible for providing to the MDNRE financial information sufficient to demonstrate that Defendant satisfies the Financial Test. If Defendant utilizes the Financial Test to satisfy the financial assurance requirement of this Consent Judgment, Long-Term Costs shall be documented, at Defendant's discretion, on the basis of either: a) an annual estimate of maximum costs for the response activities required by the Consent Judgment as if they were to be conducted by a person under contract to the MDNRE (MDNRE-Contractor Costs); or b) an annual estimate of maximum costs for the response activities required by the Consent Judgment as if they were to be conducted by employees of Defendant and/or contractors hired by Defendant, as applicable (Defendant's Internal Costs). In addition, Defendant shall resubmit the Financial Test and the associated required documents annually within 90 days of the end of its fiscal year or any Guarantor's fiscal year, subject to Section XX.C. Defendant is not required to provide another type of FAM so long as Defendant continues to meet the requirements for the Financial Test.

3. Ninety (90) days prior to the five (5)-year anniversary of the effective date of this Third Amendment to Consent Judgment, and each subsequent five (5)-year anniversary, Defendant shall provide to the MDNRE for its approval, a report (Long-Term Cost Report) containing the following:

a. If Defendant is required to provide a FAM other than the Financial Test or if Defendant's estimate of the long term costs for the Financial Test is based on Defendant's Internal Costs, then the Long-Term Cost Report shall contain the actual costs of the response activities required to meet the remedial objectives of this Consent Judgment at the Site for the previous five-year period and an estimate of the amount of funds necessary to assure the

performance of the response activities required to meet the remedial objectives of this Consent Judgment at the Site for the following thirty (30)-year period given the financial trends in existence at the time of preparation of the report (Long-Term Cost Report). The Long-Term Cost Report shall also include all assumptions and calculations used in preparing the necessary cost estimate and be signed by an authorized representative of Defendant who shall confirm the estimate is based upon actual costs. Defendant may only use a present worth analysis if an interest accruing FAM is selected; or

b. If Defendant's estimate of the Long Term Costs for the Financial Test is based on MDNRE-Contractor Costs, and the actual costs are less than the estimate, the Long-Term Cost Report shall contain a certification from Defendant that the total actual costs Defendant incurred to implement the required response activities for the previous five-year period was less than the previously provided cost estimate based on MDNRE-Contractor Costs. If actual costs are more than the estimate, then Defendant shall provide the actual cost incurred to meet the remedial objectives of this Consent Judgment for the previous five years. The Long-Term Cost Report shall also include an estimate of the amount of funds necessary to assure the performance of the response activities required to meet the remedial objectives of this Consent Judgment at the Site for the following thirty (30)-year period given the financial trends in existence at the time of preparation of the Long-Term Cost Report. The Long-Term Cost Report shall also include all assumptions and calculations used in preparing the necessary cost estimate and be signed by an authorized representative of Defendant.

4. Within 30 days of receiving MDNRE's approval of the Long-Term Cost Report, or within 90 days of the end of Defendant's (or any Guarantor's) fiscal year, whichever is later, Defendant shall resubmit its Financial Test, which shall reflect Defendant's (or, at its

option, its parent corporation, Pall Corporation's) current financial information and the current estimate of the costs of the response activities required by the Consent Judgment. If this or any Financial Test indicates that Defendant (and its parent corporation, Pall Corporation if Defendant chooses to include Pall Corporation as a corporate guarantor) no longer satisfies the Financial Test, Defendant will be required to provide to MDNRE for its approval a revised current estimate of the costs of the response activities required by the Consent Judgment to reflect the costs needed for the MDNRE to perform the necessary work using MDNRE contractors. The Parties shall negotiate a mutually acceptable alternative FAM. If the Parties are unable to reach an agreement, Plaintiffs shall provide Defendant with the FAM that will be required, which Defendant must provide unless Defendant initiates dispute resolution pursuant to Section XVI of the Consent Judgment, however during the dispute resolution process, Defendant may not challenge the underlying requirement that some type of FAM is required.

#### **XXI. RECORD RETENTION**

Defendant, Plaintiffs, and their representatives, consultants, and contractors shall preserve and retain, during the pendency of this Consent Judgment and for a period of ten years after its termination, all records, sampling or test results, charts, and other documents that are maintained or generated pursuant to any requirement of this Consent Judgment, including, but not limited to, documents reflecting the results of any sampling or tests or other data or information generated or acquired by Plaintiffs or Defendant, or on their behalf, with respect to the implementation of this Consent Judgment. After the ten year period of document retention, the Defendant and its successors shall notify Plaintiffs, in writing, at least 90 days prior to the destruction of such documents or records, and upon request, the Defendant and/or its successor shall relinquish custody of all records and documents to Plaintiffs.

#### **XXII. ACCESS TO INFORMATION**

Upon request, Plaintiffs and Defendant shall provide to the requesting Party copies of or access to all nonprivileged documents and information within their possession and/or control or that of their employees, contractors, agents, or representatives, relating to activities at the Site or to the implementation of this Consent Judgment, including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information related to the Remedial Action. Upon request, Defendant shall also make available to Plaintiffs, their employees, contractors, agents, or representatives with knowledge of relevant facts concerning the performance of the Remedial Action. The Plaintiffs shall treat as confidential all documents provided to Plaintiffs by the Defendant marked "confidential" or "proprietary."

### **XXIII. NOTICES**

Whenever under the terms of this Consent Judgment notice is required to be given or a report, sampling data, analysis, or other document is required to be forwarded by one Party to the other, such notice or document shall be directed to the following individuals at the specified addresses or at such other address as may subsequently be designated in writing:

**For Plaintiffs:**

Sybil Kolon  
Project Coordinator  
Michigan Department  
of Natural Resources  
and Environment  
Remediation Division  
301 East Louis Glick Highway  
Jackson, MI 49201

**For Defendants:**

Farsad Fotouhi  
Vice President of Corporate Environmental  
Engineering  
Gelman Sciences, Inc.  
600 South Wagner Road  
Ann Arbor, MI 48106

and

Michael L. Caldwell  
Zausmer, Kaufman, August, Caldwell &  
Tayler, P.C.  
31700 Middlebelt Road, Ste. 150  
Farmington Hills, MI 48334

Any party may substitute for those designated to receive such notices by providing prior written notice to the other parties.

#### **XXIV. MODIFICATION**

This Consent Judgment may not be modified unless such modification is in writing, signed by all Parties, and approved and entered by the Court. Remedial Plans, work plans, or other submissions made pursuant to this Consent Judgment may be modified by mutual agreement of the Parties.

#### **XXV. CERTIFICATION AND TERMINATION**

A. When Defendant determines that it has completed all Remedial Action required by this Consent Judgment, Defendant shall submit to the MDNR a Notification of Completion and a draft final report. The draft final report must summarize all Remedial Action performed under this Consent Judgment and the performance levels achieved. The draft final report shall include or refer to any supporting documentation.

B. Upon receipt of the Notification of Completion, the MDNR will review the Notification of Completion and the accompanying draft final report, any supporting documentation, and the actual Remedial Action performed pursuant to this Consent Judgment. After conducting this review, and not later than three months after receipt of the Notification of Completion, the MDNR shall issue a Certificate of Completion upon a determination by the MDNR that Defendant has completed satisfactorily all requirements of this Consent Decree, including, but not limited to, completion of all Remedial Action, achievement of all termination and treatment standards required by this Consent Judgment, compliance with all terms and conditions of this Consent Judgment, and payment of any and all stipulated penalties owed to Plaintiffs. If the MDNR does not respond to the Notification of Completion within three months



after receipt of the Notification of Completion, Defendant may submit the matter to Dispute Resolution pursuant to Section XVI. This Consent Judgment shall terminate upon motion and order of this Court after issuance of the Certificate of Completion. Upon issuance, the Certificate of Completion may be recorded.

**XXVI. RELATED SETTLEMENT**

The Parties' agreement to be bound by this Consent Judgment is contingent upon the stipulation by the Parties to, and the entry by the Court of, the proposed Consent Judgment in the related case State of Michigan v Gelman Sciences, Inc. (E.D Mich. No. 90-CV-72946-DT), a copy of which is attached hereto as Attachment I. In the event that the related Consent Judgment in Michigan v Gelman Sciences, Inc. is not entered, this Consent Judgment shall be without force and effect.

**EFFECTIVE DATE**

The effective date of this Consent Judgment shall be the date upon which this Consent Judgment is entered by the Court.

**XXVII. SEVERABILITY**

The provisions of this Consent Judgment shall be severable. Should any provision be declared by a court of competent jurisdiction to be inconsistent with federal or state law, and therefore unenforceable, the remaining provisions of this Consent Judgment shall remain in full force and effect. XXIX. SIGNATORIES Each undersigned representative of a Party to this Consent Judgment certifies that he or she is fully authorized by the Party to enter into this Consent Judgment and to legally bind such Party to the respective terms and conditions of this Consent Judgment shall remain in full force and effect.

**XXVIII. SIGNATORIES**

Each undersigned representative of a Party to this Consent Judgment certifies that he or she is fully authorized by the Party to enter into this Consent Judgment and to legally bind such Party to the respective terms and conditions of this Consent Judgment.

IT IS STIPULATED AND AGREED:

PLAINTIFFS

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DEFENDANTS

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# *EXHIBIT B*

COPY

STATE OF MICHIGAN

IN THE CIRCUIT COURT FOR THE COUNTY OF WASHTENAW

---

JENNIFER GRANHOLM, Attorney  
General for the State of Michigan, ex rel,  
MICHIGAN NATURAL RESOURCES  
COMMISSION, MICHIGAN WATER  
RESOURCES COMMISSION, and  
MICHIGAN DEPARTMENT OF NATURAL  
RESOURCES,

Plaintiff,

Case No. 88-34734-CE

vs

Honorable Donald E. Shelton

GELMAN SCIENCES, INC.,

Defendant.

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**OPINION AND REMEDIATION ENFORCEMENT ORDER**

At a Session of the Court held in the  
Washtenaw County Courthouse in  
the City of Ann Arbor, on July 17, 2000

**PRESENT: HONORABLE DONALD E. SHELTON, Circuit Judge**

This case was originally filed in 1988 by the State to require Gelman Sciences, Inc. to clean up pollution of local water supplies caused by the discharge of dioxane from its manufacturing facility. A consent judgment identifying the required remediation actions was agreed to by the parties and entered on October 22, 1992. In the 12 years this case has been pending, many things have changed, including the identity of the participants. The successor to the plaintiff agency is now called the Michigan Department of Environmental Quality ("MDEQ"). The defendant corporation has been acquired by another company and is now known as Pall/Gelman Sciences, Inc. ("PGSI).

The original judge retired and the case was reassigned and has subsequently been reassign to this Court as companion to other litigation involving this issue. The original consent judgment was amended by the parties and the Court on September 23, 1996 and again on October 20, 1999.

On February 14, 2000 plaintiff filed a motion to enforce the consent judgment. The MDEQ claims that PGSI has not complied with the terms of the consent judgment as amended and seeks equitable relief in the form of an order requiring PGSI to perform specific "environmental response activities" to achieve the cleanup requirements of the consent judgment. The MDEQ also seeks to an order requiring the payment of certain "stipulated penalties" provided in the consent judgment. PGSI asserts that it has actively sought to remediate the pollution and that no penalties are due under the terms of the judgment. The issues were defined in a Joint Prehearing Statement filed by the parties on June 21, 2000. An evidentiary hearing was conducted on July 6, 7 and 10, 2000. The parties were also given the opportunity to respond to the Court's proposed Order. The Court's findings and conclusions, in part, are set forth below in this Opinion and Order.

The monitoring and purging of dioxane from the aquifers flowing under and around the Gelman facility is an ongoing process. The defendant, particularly since the change in ownership, has acted in good faith to meet its obligations to identify and clean up the polluted water supplies. It is also clear, however, that the purging of dioxane has not occurred fast enough to provide the public, or the Court, with assurance that the plume of dioxane was contained as early as it should have been or that there is an ongoing approved plan that will lead to the removal of unlawful levels of this pollutant from the area's water supplies. In part this appears to be because Gelman, especially

early on, did not know how to detect or remove the pollutant or act quickly enough to find out and do so. In part, however, this also appears to be because the MDEQ itself did not know how to monitor or purge the pollutant or it just acted far too slowly in its "reactive only" mode to Gelman's proposed work plans. It also appears that some of the delay has been the result of the inability to obtain land and other access to install the necessary monitoring, purging and treating equipment.

Assigning responsibility for these delays however is not this Court's priority. The fact is that the consent judgment of the Court, as subsequently amended, was intended to bring about a cleanup of this pollution and it has not yet done so. It is far less important to fix blame for that failure than it is to enforce its terms to bring about the cleanup. Based upon the evidence submitted, this Court is going to grant equitable relief in the sense that the Court will use its equitable powers to enforce the consent judgment to insure that dioxane levels in these water supplies is brought within acceptable standards as soon as possible. Both sides in this dispute appear to need the intervention of the Court to keep them moving toward this goal.

The Court's remediation order is designed first to require PGSI to submit an enforceable long range plan which will reduce all dioxane in these water supplies below legally acceptable levels and second to order immediate measures to move that process along faster than it has moved in the past. As to the request for monetary penalties, there has been considerable testimony about whether PGSI is liable for stipulated penalties under the amended consent judgment. The Court will take these requests for penalties under advisement. However, the parties are advised that the Court intends to enforce the consent judgment and the equitable

remediation measures in this order by virtue of its contempt powers and all of the sanctions available thereunder.

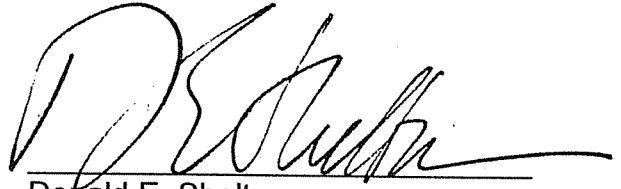
### Remediation Enforcement Order

1. PGSI shall submit a detailed plan, with monthly benchmarks, which will reduce the dioxane in all affected water supplies below legally acceptable levels within a maximum period of five years from the date of this Order. The plan will also provide for subsequent monitoring of those water supplies for an additional ten year period thereafter. This plan will be submitted to the MDEQ for review within 45 days of this Order. MDEQ will respond within 75 days of this Order and the parties will confer and discuss the issues raised by the MDEQ review, if any. The plan will then be submitted to this Court within 90 days of this Order, for review and adoption as an Order of the Court.
2. As to the area in which monitoring well "10d" is located, the additional monitoring wells requested by the MDEQ will be installed within 60 days of this Order. An additional two purging wells in the monitoring well 10d area will be also be installed and operational within 60 days of this Order.
3. PGSI will install an additional ultraviolet treatment unit which shall be operational within 75 days of this Order. The capacity of the unit shall be consistent with the Court's maximum total remediation period of 5 years described in paragraph 1 of this Order.

4. Purging from the horizontal well in the Evergreen area shall commence within 30 days after the additional ultraviolet treatment unit is installed.
5. The combined pumping rate of the LB1, LB2 and AE1 purging wells will be increased to 200 gpm within 30 days after the additional ultraviolet treatment unit is installed.
6. Monitoring wells in the Dupont section of the Evergreen area will be installed as requested by the MDEQ. These wells will be operational within 45 days after access is obtained. PGSI shall secure access for those wells within 30 days of this Order or, if necessary, commence legal action to do so within that time.
7. In the Western area, PGSI shall install monitoring wells as requested by MDEQ. These wells will be operational within 45 days after access is obtained. PGSI shall secure access for those wells within 30 days of this Order or, if necessary, commence legal action to do so within that time. In the event that monitoring of those wells for five months thereafter shows an increasing concentration of dioxane above legally acceptable levels, then a purging well will be installed and be operational within 60 days after that five month period. The Court reserves judgment as to any other remedial measures in this area in the event that there is no evidence of such increasing levels.

**IT IS SO ORDERED.**





Donald E. Shelton  
Circuit Judge

# *EXHIBIT C*

**Executive Summary  
Gelman Sciences, Inc. Unit E Aquifer  
Groundwater Contamination  
Decision Document**

**Site Name and Location:**

Gelman Sciences, Inc.  
Scio Township  
Washtenaw County  
Site ID #: 81000018

**Purpose:**

This document is prepared in accordance with Section 20120d of Part 201 (Environmental Remediation) of the Natural Resources and Environmental Protection Act (NREPA) to provide a summary of the decision regarding cleanup of the Unit E aquifer groundwater contamination plume (Unit E Plume) plume, along with the reasons for the Department of Environmental Quality (DEQ) selecting a remedial action for the Unit E Plume at the Gelman Sciences, Incorporated site of environmental contamination (Gelman site.) This document is also prepared in response to the status conference in Washtenaw County Circuit Court on February 25, 2004, wherein the court ordered Pall Life Sciences, Inc. (PLS) to submit their comprehensive feasibility study (FS) by June 1, 2004, and the DEQ to respond to the FS by September 1, 2004. This document supplements previous remedial decisions for other contaminated groundwater units that are embodied in the October 1992 Consent Judgment (File No. 88-34734-CE), and subsequent Remediation and Enforcement Order dated July 17, 2000.

**Basis:**

The decision outlined in this document is based upon the Administrative Record developed by the DEQ.

**Summary:**

The Gelman site is comprised of the PLS plant property located on Wagner Road just south of Jackson Road in Scio Township, and extends eastward and north-eastward into the City of Ann Arbor, and westward and north-westward in Scio Township. From 1966, to 1986, PLS used 1,4-dioxane in the manufacture of medical filters. Various methods of disposal and waste handling during this period resulted in widespread groundwater contamination. Three major aquifers were identified and designated as the Unit C<sub>3</sub> (includes the Core Area), Unit D<sub>0</sub> (includes the Western System), and Unit D<sub>2</sub> (includes the Evergreen System) aquifers. PLS began groundwater remediation efforts to address these aquifers in 1997. In May of 2001 the deeper, Unit E Aquifer, was also discovered to be contaminated. Since the contamination in the Unit E aquifer was discovered, 30 monitoring wells have been installed to determine the nature and extent of contamination. In May 2003, PLS and DEQ agreed that PLS should develop a FS to systematically evaluate remedial alternatives for the Unit E Plume.

The June 2004, FS examined remedial alternatives for addressing the entire Unit E Plume, and proposed PLS's remedial alternative. The DEQ reviewed PLS's FS and

preliminarily concluded that PLS's proposed alternative could not be approved as presented. On July 7, 2004, the DEQ preliminarily identified a remedial alternative consistent with Part 201, and solicited public comment.

Upon considering public comments received during the public comment period, the DEQ makes the following decision regarding the Unit E plume:

In order to address the elements required for remedial actions under Part 201, the DEQ has determined that extracting and treating contaminated groundwater in the vicinity of Wagner Road and Maple Road, coupled with capture of the "leading edge" of contamination is necessary to comply with Part 201, and the Consent Judgment. The performance objectives for the groundwater extraction in the vicinity of Maple Road, the vicinity of Wagner Road, and for the leading edge are that, once initiated, a hydraulic barrier should be created to halt the further migration of concentrations of 1,4-dioxane above 85 ppb in the downgradient or easterly direction.

The DEQ believes there may an opportunity for PLS to satisfy the conditions set forth on pages 15 and 16 of the attached detailed Decision Document, and that, if those conditions can be satisfied, capturing the leading edge of the plume would not be necessary to satisfy Part 201 criteria. PLS has indicated to the DEQ that it may be able to satisfy those conditions within one year. Thus the DEQ has outlined in this Decision Document parallel pathways PLS can take to explore their ability to satisfy the necessary conditions that would allow the leading edge of the Unit E Plume to lawfully migrate untreated, while concurrently moving forward with the necessary steps to expeditiously perform interim response actions and enable timely treatment at the leading edge, if that is necessary.

**Statutory Determinations:**

This DEQ Decision is protective of public health, safety, and welfare, and the environment. The Decision provides for removal of hazardous substances from the Unit E Plume until Generic Residential Cleanup Criteria protective for drinking water are met. Alternatively, this Decision provides for complying with other provisions of Part 201 and the Consent Judgment.

\_\_\_\_\_  
Andrew W. Hogarth, Chief  
Remediation and Redevelopment Division

\_\_\_\_\_  
Date

Attachment

**Decision Document**  
**Gelman Sciences, Inc. Unit E Aquifer**  
**Washtenaw County, Scio Township**  
**Groundwater Contamination**  
**September 1, 2004**

**Introduction**

This document is prepared in accordance with Section 20120d of Part 201 (Environmental Remediation) of the Natural Resources and Environmental Protection Act (NREPA) to provide a summary of the decision regarding cleanup of the Unit E aquifer groundwater contamination plume (Unit E Plume), along with the reasons for the Department of Environmental Quality's (DEQ) selection of a remedial alternative for the Unit E Plume at the Gelman Sciences, Incorporated (GSI) site of environmental contamination (Gelman site.) This document is also prepared pursuant to a Washtenaw County Circuit Court order that required Pall Life Sciences (PLS) to submit a final feasibility study (FS) for the Unit E Plume to the DEQ by June 1, 2004, and required the DEQ to make a decision regarding cleanup of the Unit E Plume by September 1, 2004. In February 1997, the Pall Corporation acquired GSI, and the company was known as Pall/Gelman Sciences, Inc. until 2001, when the company changed its name to PLS. For simplicity, this document will refer to PLS regarding all past and current actions of the company. This document will refer to all areas that have been impacted by the contamination as the "Gelman site".

**Gelman Site Location and General History**

The Gelman site is comprised of the PLS plant property located on Wagner Road just south of Jackson Road in Scio Township, and extends eastward and north-eastward into the City of Ann Arbor, and westward and north-westward in Scio Township. From 1966, to 1986, PLS used 1,4-dioxane in the manufacture of medical filters. Various methods of disposal and waste handling during this period resulted in widespread groundwater contamination. In the fall of 1985, the first contaminated private water supply wells were discovered in the vicinity of the PLS property, and additional well sampling was done. Bottled water was provided to affected residences and businesses until the municipal water supply was extended into these areas. To date, approximately 124 private water supply wells have been connected to the municipal water supply system as a result of groundwater contamination.

Beginning in 1986, investigations by PLS identified soil contamination on the PLS property, and four areas of groundwater contamination extending off the property. Three major aquifers were identified and designated as the Unit C<sub>3</sub> (includes the Core Area), Unit D<sub>0</sub> (includes the Western System), and Unit D<sub>2</sub> (includes the Evergreen System) aquifers. In May of 2001, the deeper, Unit E aquifer, was also discovered to be contaminated. The complex geology in the vicinity of the PLS property contributed to the widespread nature of the contamination.

The compound of concern at the Gelman site is 1,4-dioxane (C<sub>4</sub>H<sub>8</sub>O<sub>2</sub>). It is an organic solvent that is most often used as a stabilizer in chlorinated solvents. In the case of PLS, pure 1,4-dioxane was used as a solvent for cellulose in the filter manufacturing process. The compound 1,4-dioxane is completely soluble in water, and is held together by strong bonds that prevent it from breaking down readily in groundwater. Toxicity testing has

determined that high doses of 1,4-dioxane cause cancer in mice. It is presumed to be a human carcinogen through long-term exposure to low doses.

When the contamination was first discovered in late 1985, the generic residential cleanup criteria were 3 parts per billion (ppb) for groundwater, and 60 ppb for soils. In June 1995, the state legislature amended Part 201 of the NREPA, resulting in an increase of the generic residential cleanup criteria to 77 ppb for groundwater, and 1,500 ppb for soils. In June 2000, the DEQ updated its risk based cleanup criteria, which resulted in the current generic residential cleanup criteria of 85 ppb for groundwater, and 1,700 ppb for soils. The concentration in surface water considered safe for public health and the environment is 2,800 ppb if the surface water is not used as a source of drinking water. However, if that surface water is used as a source of drinking water, the concentration considered safe is 34 ppb.

Common treatment systems are ineffective in removing 1,4-dioxane from water. Ultraviolet oxidation, which is currently being used at the Gelman site, uses a combination of hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>), and ultraviolet light to convert 1,4-dioxane to carbon dioxide and water.

PLS has tested a new treatment technology, using ozone and hydrogen peroxide, for use at current and future treatment locations. The DEQ has not yet approved the use of this new technology. One advantage of this treatment method would be that it eliminates the use of three hazardous chemicals required by the current treatment system.

The maximum concentration of 1,4-dioxane found in different areas of the Gelman site has changed over time, as shown in Table 1.

**Table 1 - Concentrations of 1,4-Dioxane Past and Recent**

<b>System</b>	<b>1,4-dioxane (ppb)</b>	<b>Year</b>	<b>1,4-dioxane (ppb)</b>	<b>Year</b>	<b>Applicable Standard</b>
<b>Core</b>	212,000	1988	11,390	2003	85 ppb
<b>Evergreen</b>	43	1990	3,031	2003	85 ppb
<b>Western</b>	132	1986	175	2003	85 ppb
<b>Marshy</b>	49,800	1994	14,300	2003	85 ppb
<b>Unit E</b>	3,250	2001	7,800	2004	85 ppb
<b>Soils</b>	2,400,000	1988	944,000	1998	1,700 ppb

**Summary of Gelman Site Risks**

Part 201 of the NREPA requires liable parties to implement response activities at sites of environmental contamination. Parties are allowed to consider current and future land use as a basis for determining the degree of cleanup required at a specific site. As part of deciding whether a cleanup is appropriate, liable parties and the DEQ are required to evaluate many potential pathways of exposure and determine which, if any, pathways are or may be complete. Pathways that are complete, or realistically may become complete, must be addressed in some fashion. The types of pathways considered include, among

other things, use of groundwater for drinking water, groundwater discharging to surface water, volatilization from soil or groundwater to indoor air.

The DEQ has established generic cleanup criteria for soils and groundwater which are protective of public health and the environment in various exposure pathways. As mentioned in the "Gelman Site Location and General History" section of this document, the DEQ has promulgated a generic residential cleanup criterion (GRCC) for 1,4-dioxane in groundwater of 85 ppb, based on consumption of groundwater for drinking water. This is a risk based criterion calculated by the DEQ, and is not a drinking water standard as could be, but has not been, established by a state or federal agency. The use of groundwater for drinking water from the Unit E Plume is a completed pathway. Residents in Scio and Ann Arbor townships rely on groundwater for their drinking water, and the City of Ann Arbor uses a combination of groundwater and surface water to provide drinking water to their residents and citizens.

### **Gelman Site Enforcement Activities**

Legal actions by the state against PLS began in 1988, and ultimately resulted in two separate Consent Judgments (CJ) in October 1992: one for cleanup actions, and another for recovery of state response costs of \$1.1 million. In September 1996, the CJ for cleanup actions was amended to incorporate the cleanup criteria changes brought about by the June 1995 amendments to Part 201 of the NREPA, and to establish new schedules where needed. Because of the complexity of the Gelman site, the original CJ for cleanup actions divided the site into six separate systems (Core, Evergreen, Western, Marshy, Soils, and Spray Irrigation Field) with specific requirements for each.

In February 2000, the Department of Attorney General (DAG) filed a motion in Washtenaw County Circuit Court (court) to enforce several provisions of the CJ with which PLS had not complied. A hearing on the motion was held in July 2000, regarding stipulated penalties and injunctive relief for additional response actions. During the hearing, staff of PLS testified that they would have an additional treatment system added to their central treatment facility within ten weeks, after which accelerated extraction of contaminated groundwater would be initiated from the existing Evergreen extraction wells, and the horizontal wells in the aquifer leading to the Evergreen subdivision area. PLS staff estimated that their plan for additional extraction would result in achieving the cleanup criteria within five years. On July 17, 2000, the court issued an Opinion and Remediation Enforcement Order (REO). The DEQ's request for penalties was taken under advisement. The court ordered PLS to perform most of the additional investigation requested by the DEQ. The court also ordered PLS to install the additional treatment equipment within 75 days, and to submit a plan to the DEQ within 45 days to outline steps for achieving the cleanup criteria in all affected water supplies within five years.

As a result of the additional investigation of the Western System requested by the DEQ, a connection between the upper contaminated units and Unit E aquifer was discovered.

The court continues to hold all penalties under advisement. Status conferences are being held periodically, with the next one scheduled for 3:00 p.m. on September 8, 2004, at the Washtenaw County Circuit Court.

## FIVE YEAR PLAN

The Five Year Plan (Plan), as revised to incorporate concerns raised by the DEQ, was adopted by the court in January 2001. The Plan covers the entire Gelman site except the Unit E aquifer, and generally replaces previously approved work plans for separate systems. The Plan allows PLS flexibility to adjust some components of the remediation systems, but requires minimum extraction rates at key locations until changes are approved by the DEQ. Monthly benchmarks, as required by the REO, have been incorporated into the Plan. These benchmarks require the removal of a specified number of pounds of 1,4-dioxane each month, and are revised annually. The rate of mass removal decreases gradually over the life of the Plan as the concentration of 1,4-dioxane in the aquifers is reduced by cleanup actions. PLS is submitting quarterly reports on the progress of the remedial actions. The DEQ and PLS also meet regularly to discuss progress and determine what adjustments are needed.

### Unit E Plume

The Unit E aquifer is contaminated with 1,4-dioxane above the residential criterion (based on drinking water) in an area extending from Parkland Plaza to Worden Street, east of Veterans Park. The Unit E aquifer is the deepest of the glacial aquifers, and lies just above the bedrock, over 200 feet below the ground surface in some areas.

In the spring of 2001, as a result of the DEQ requested investigation of the Western System, it was discovered that there is no confining layer of clay separating the Unit D<sub>2</sub> aquifer from the Unit E aquifer in an area west of the PLS property. The exact location(s) of the connection(s) that has allowed 1,4-dioxane contamination to migrate into the Unit E aquifer has not been determined. Investigation to-date has focused on defining the extent of contamination. In reviewing historic data, it was discovered that earlier data indicated that the Unit E was contaminated, however, this fact escaped the attention of the DEQ at that time, and was not brought to the attention of the DEQ by PLS or other parties.

Following the discovery of contamination in the Unit E aquifer in May 2001, 30 monitoring wells have been installed to determine the nature and extent of contamination. Recent investigation has focused on the area in and around Veterans Park, and the Maple Village Shopping Center (MVSC). In March 2003, PLS proposed an interim response at the MVSC. Monitoring wells installed since that time show that the width of the plume at that location is over 1,000 feet. After reviewing the data, PLS determined that their March 2003, proposal was not feasible due to the volume of water that would need to be extracted, treated, and discharged.

In May 2003, PLS and DEQ agreed that PLS should develop a feasibility study to systematically evaluate remedial alternatives for the Unit E Plume.

In July 2003, PLS drilled a test boring on the west side of the MVSC as part of an effort to drill a test well for use as a potential extraction well. Sampling results obtained from the test boring determined that the highest concentration of 1,4-dioxane at that location was 282 ppb. Because this was much lower than the maximum concentration known to be present in the MVSC area, it was decided that the location of the test boring was not optimal for groundwater extraction. A new location for a test well was selected and



installed (TW-16), near the intersection of Jackson and Maple Roads. PLS completed an aquifer performance test of TW-16 in August 2003, and the results are being considered by the DEQ in its review of remedial alternatives proposed by PLS.

In November 2003, PLS performed a series of tests to determine if *in situ* (in place) oxidation of groundwater with ozone and/or hydrogen peroxide is a feasible remedial alternative and determined the need to do additional testing. This delayed the planned submittal date of a comprehensive feasibility study to examine alternatives for addressing the entire Unit E aquifer contamination. In January 2004, at the request of the DEQ, PLS submitted an interim FS to summarize remedial alternatives considered to-date. The DEQ provided comments on the interim feasibility study on April 13, 2004.

The DEQ also provided conditional approval of PLS's *In Situ* Work Plan dated February 17, 2004. PLS implemented the work plan in March through May 2004, and planned to evaluate the results for inclusion in the comprehensive feasibility study, if applicable. Because the technology proved to be infeasible, it was not considered further.

From May 2002, through June 2004, PLS operated two extraction wells (TW-11 and TW-12), in upgradient portions of the Unit E aquifer on their property, removing about 150 gallons per minute (gpm) during that time period. In July 2004, PLS began operating a new extraction well, TW-17, and ceased operation of TW-12, in which concentrations had decreased to 68 ppb. As of the end of July 2004, TW-11 and TW-17 were collectively removing 228 gpm, and the concentration of 1,4-dioxane in those two wells were 600 ppb and 670 ppb, respectively.

At a status conference in Washtenaw County Circuit Court on February 25, 2004, the court ordered PLS to submit their comprehensive FS by June 1, 2004, and the DEQ to respond to the FS by September 1, 2004. The FS examined remedial alternatives for addressing the entire Unit E Plume, and proposed PLS's remedial alternative.

As discussed below, the DEQ reviewed PLS's FS, and preliminarily concluded that PLS's proposed alternative could not be approved as presented. The DEQ preliminarily identified a remedial alternative consistent with Part 201, and solicited public comment. The following sections document the DEQ's decision process and identify the DEQ's remedial alternative and the rationale for its selection.

### **Evaluation of the Feasibility Study**

On June 2, 2004, PLS submitted its Final FS, and Proposed Interim Response Plan to the DEQ. The DEQ thoroughly evaluated the FS, and has prepared this document in response to the major items addressed in the FS. PLS did not address all of the DEQ's comments on the interim FS for the Unit E Plume in the current FS. The absence of comments on any item in the FS should not be interpreted as DEQ's agreement with such items.

PLS considered an array of process options that were combined into thirteen separate remedial alternatives, and are summarized below. These alternatives were screened and the eight surviving alternatives were evaluated in more detail. PLS asserted that each of these eight alternatives would adequately protect public health due to the depth of the

groundwater and the existence of a municipal water supply. Alternatives that did not survive the screening process are noted below as having been eliminated. The DEQ's outline of the alternatives PLS considered is listed below. The DEQ has revised the title of some of the alternatives to more accurately reflect the proposed response action.

### **Alternative 1 – No Action**

This alternative is considered for comparison purposes, and was eliminated due to not meeting the requirements of Part 201.

### **Alternative 2 – Monitored Natural Attenuation and Institutional Controls**

This alternative includes:

- a hydrogeological investigation to determine where the groundwater contamination (plume) would flow if no remedial action is taken
- a network of monitoring wells to track the migration of the plume
- long-term monitoring
- institutional controls (deed restrictions or a local ordinance) to restrict use of the groundwater

This alternative was eliminated due to the uncertainty of public support.

### **Alternatives 3a-e – Groundwater Pumping at Leading Edge, Pipeline to PLS Wagner Road Facility, Treatment and Discharge by Various Methods**

These alternatives share:

- extraction from three wells of approximately 500 gpm to prevent further migration of contamination in excess of the GRCC
- pipeline to PLS property on Wagner Road for treatment
- treatment with ultra-violet light and hydrogen peroxide (current method), or ozone and hydrogen peroxide

The five discharge methods/locations considered are:

- a. pipeline to the Huron River
- b. reinjection into plume at multiple locations on PLS property where 1,4-dioxane exceeds 85 ppb
- c. reinjection into plume at multiple locations where 1,4-dioxane is 1-85 ppb
- d. reinjection into plume at multiple locations where 1,4-dioxane is less than 1 ppb
- e. Discharge to Honey Creek at existing outfall

Alternative 3b was eliminated due to the unknown effects of reinjection within the plume.

Alternative 3d was eliminated due to the inability to reliably treat groundwater to non-detect.

### **Alternatives 4a-d – Groundwater Pumping at Leading Edge, Treatment with Ozone and Hydrogen Peroxide near Maple Road, Discharge by Various Methods**

These alternatives share:

- extraction from three wells of approximately 500 gpm to prevent further migration of contamination in excess of the GRCC
- pipeline to the Maple Road area for treatment
- treatment with ozone and hydrogen peroxide

The four discharge methods/locations considered are:

- a. pipeline to the Huron River

- b. reinjection into plume at multiple locations on PLS property where 1,4-dioxane exceeds 85 ppb
- c. reinjection into plume at multiple locations where 1,4-dioxane is 1-85 ppb
- d. reinjection into plume at multiple locations where 1,4-dioxane is less than 1 ppb

Alternative 4b was eliminated due to the unknown effects of reinjection within the plume. Alternative 4d was eliminated due to the inability to reliably treat groundwater to non-detect.

**Alternative 5 – Groundwater Pumping at Leading Edge, Pipeline to PLS Wagner Road Facility, Injection into Deep Formation Without Treatment**

This alternative includes:

- extraction from three wells of approximately 500 gpm to prevent further migration of contamination in excess of the GRCC
- pipeline to PLS property on Wagner Road
- injection into the deep formation (about one mile deep, below bedrock) without treatment

**Alternative 6 – Migration of Plume toward the Huron River, Groundwater Pumping near Huron River (if necessary to meet criteria), Treatment and Discharge to the Huron River**

This alternative is similar to Alternative 2, with the addition of:

- a contingency to extract, treat and discharge groundwater to the Huron River if concentrations of 1,4-dioxane exceed relevant criteria
- relying on the Washtenaw County Rules and Regulations for Protection of Groundwater and court orders as institutional controls to restrict use of the groundwater

**PLS’s Proposed Remedial Alternative**

PLS conducted a detailed review of the eight alternatives that survived the screening process and chose Alternative 6, with the addition of interim response actions for an undetermined length of time, to reduce the mass of 1,4-dioxane, in order to minimize the possibility that downgradient groundwater extraction and treatment will be necessary. The components of PLS’s Proposed Remedial Alternative (PRA) are:

- a hydrogeological investigation to determine where the Unit E Plume would flow if no remedial action is taken
- a network of monitoring wells to track the migration of the plume
- long-term monitoring
- installation of one or two more extraction wells near Wagner Road and an increase in the extraction rate to 250 gpm (currently 228 gpm from two extraction wells), with treatment and discharge to the Honey Creek Tributary under their existing discharge permit;
- extraction of 200 gpm from one well at Maple Road, nearby treatment with ozone and hydrogen peroxide and reinjection into two wells at Maple Road, north and south of the extraction point.
- a contingency to extract, treat and discharge groundwater to the Huron River if concentrations of 1,4-dioxane exceed relevant criteria at compliance points protective of the Huron River

- relying on the Washtenaw County Rules and Regulations for Protection of Groundwater (WCRRPG) and court orders as institutional controls to restrict use of the groundwater

### **Criteria for Selecting Remedial Actions**

Under the CJ, actions taken by PLS must capture groundwater contamination in excess of applicable cleanup standards emanating from its facility, and properly dispose of the treated groundwater. Part 201 and the Part 201 Rules identify a number of criteria the DEQ must use in selecting Remedial Actions. Section 20118(2) specifies that, at a minimum, remedial actions must:

- a. assure the protection of the public health, safety, and welfare, and the environment;
- b. except as otherwise provided, attain a degree of cleanup and control of hazardous substances that complies with all relevant and appropriate requirements, rules, criteria, limitations and standards of state and federal environmental law. [NOTE: Section 20118(5) and (6) allows the Department to “waive” the requirements of Rule 299.5705(5) and 299.5705(6) under certain conditions. These rules specify that remedial actions not allow contaminated groundwater plumes to expand once a remedial action is initiated, and provide for active removal of hazardous substances from contaminated groundwater. Exceptions to these rules will be referred to as a “waiver”.]

The DEQ considers the above requirements to be “threshold criteria” that a remedial action must satisfy. In addition, the following are considered by DEQ to be “balancing criteria” in weighing alternatives that meet the threshold criteria. Section 20118(3) and (4) state that “the cost-effectiveness of alternative means of complying with Section 20118 shall be considered by the Department only in selecting among alternatives that meet all of the criteria in Section 20118(2); and that remedial actions that permanently and significantly reduce the volume, toxicity, or mobility of hazardous substances are to be preferred.”

Part 6 of the Part 201 Rules provides additional criteria regarding remedy selection. While Rule 601 reiterates the Section 20118 requirements, Rule 603 provides additional criteria the DEQ must use in selecting remedies, including:

- The effectiveness of protecting the public health, safety, and welfare, and the environment;
- The long-term uncertainties associated with the proposed remedial action;
- The toxicity, mobility, and propensity to bio-accumulate of the hazardous substances;
- The short and long-term potential for adverse health effects from human exposure;
- The costs of the remedial action, including long-term maintenance;
- The reliability of the alternatives;
- The potential for future remedial action costs if an alternative fails;
- The potential threat to public health, safety, and welfare, and the environment associated with excavation, transportation and re-disposal or containment;
- The ability to monitor remedial performance;
- The public’s perspective about the extent to which the proposed remedial action effectively addresses Part 201 and the Part 201 Rules.

### **DEQ Analysis of PLS's PRA Using the Above Criteria**

The DEQ has carefully reviewed PLS's FS in relation to the criteria described above. The DEQ has determined that PLS's PRA is not acceptable for the reasons described below. PLS's estimated cost for their PRA is based on 20 years of monitoring followed by 30 years of operation and maintenance of the contingency treatment system, implying that the cleanup criteria will be achieved in 50 years. However, there is no documentation to support that the cleanup criteria will be achieved in 50 years. In addition, the DEQ has reviewed the WCRRPG and has determined it does not meet the requirements for an acceptable Part 201 institutional control in its current form, nor has any court order been imposed to reliably restrict groundwater use. An example of the deficiencies in the WCRRPG is that there is no provision to abandon existing drinking water wells in the area threatened or impacted by the groundwater contamination and there is no restriction on installation and operation of industrial wells, which could change the configuration of the plume.

PLS's PRA also relies on the City's anticipated decision not to resume operation of the Northwest Supply well (a.k.a. Montgomery well). PLS indicates that the available information shows that this well will not be impacted by the contamination. However, the Unit E Plume is in the western portion of the wellhead protection area for the Northwest Supply well, the City has not abandoned this well, and low levels of 1,4-dioxane have been detected in the well. In addition, the DEQ has a policy against granting waivers of its rules to allow for plume expansion in wellhead protection areas. Further, PLS's PRA presumes that the Unit E Plume will not underflow the Huron River and there is no provision to monitor or protect existing private water supply wells east of the Huron River if the plume does underflow the Huron River. PLS's PRA would impermissibly allow the extent of environmental contamination to expand. As proposed, and under present circumstances, this alternative does not meet the threshold criteria of assuring the protection of the public health, safety, and welfare, and the environment. This alternative is based on the assumption that the Unit E Plume will migrate along a predicted path toward, and discharge entirely to, the Huron River at concentrations below the groundwater-surface water interface criterion, as shown in Figure 11 from the PLS Feasibility Study. PLS assumes that no additional residential or community wells will become contaminated as a result of this migration. There is a substantial degree of long-term uncertainty associated with these assumptions and, consequently, PLS's remedial alternative. There is not currently enough information available to predict the exact route the plume will follow, including whether it will ultimately contaminate additional residential wells. Nor is there sufficient information about how long the plume will take to get to the river and/or other receptors, and what concentrations the plume will be when it arrives at receptors. The potential difficulty of securing adequate institutional controls from the City or County adds uncertainty to the feasibility of this remedial alternative and combines with the other uncertainties to make this alternative relatively unreliable in protecting public health, safety, welfare, and the environment.

PLS states that their PRA will be less disruptive and more compatible with existing land uses than the leading edge alternatives; however, it is premature to make such a statement since the ultimate path of the plume cannot be determined until a hydrogeological study is performed. The study required by such an approach would also

require numerous monitoring wells, which would also be likely to create some disruption of residential neighborhoods.

For the above reasons, the DEQ has determined that, under the present circumstances, PLS's PRA does not satisfy the requirements established by Part 201 and the Part 201 Rules.

The DEQ's preliminary identification of additional conditions that would have to be met in order for the DEQ to approve a modified version of PLS's PRA, including a waiver of Rule 705(5), are restated below. The DEQ initially identified these conditions only to allow for comparison to the other alternatives, not necessarily as a recommendation that these steps be taken.

1. Abandonment of the Montgomery well (Northwest Water Supply well) and elimination of the associated wellhead protection area designation by the City.
2. Prevention of any further migration of 1,4-dioxane contamination beyond Maple Road in excess of 2,800 ppb (the criterion protective of surface water).
3. A plan for monitoring any water supply wells that are found to be threatened with contamination by subsequent investigations to determine the fate of the plume, and a contingency plan to prevent unacceptable exposure if water supply wells are affected.
4. Enactment of an acceptable institutional control, in a specified period of time, to prevent any groundwater withdrawal that would exacerbate the contamination, in addition to preventing the use of contaminated groundwater for drinking water.
5. Groundwater monitoring to ensure that contamination above the GRCC does not underflow the Huron River, with a contingency plan to intercept any such contamination.
6. Provide for acceptable disposal of the treated groundwater from the Maple Road interim response, by providing sufficient hydrogeological information to resolve concerns about reinjection, and/or by shifting to an alternate means of disposal.

### **Public Involvement**

The DEQ has developed an in-depth Citizen Involvement Plan (CIP) for the Gelman site. The plan is attached in Appendix A, and is summarized below.

The DEQ meets quarterly with local officials from Scio Township, Washtenaw County, the City of Ann Arbor, Ann Arbor Township, and representatives of Scio Residents for Safe Water to discuss the quarterly reports submitted by PLS and other relevant issues. The DEQ has established four information repositories that are sent updates on a regular basis, about every six weeks. A DEQ internet site devoted to the Gelman project went on-line in April 2004. The DEQ has developed an e-mail list to which updates are sent frequently.

As it relates to the FS and public involvement, the DEQ discussed with the attendees of the quarterly meeting on May 3, 2004, the plan to disseminate copies of the draft FS to the information repositories upon receipt. We also explained that there would be opportunity for public comment.

On June 3, 2004, the DEQ sent copies of the FS to the information repositories and an e-mail was sent to the distribution list regarding the availability of the FS, and the DEQ's proposed public comment period and intention to hold a public meeting during the last week of July. By mid-June the FS was made available on the DEQ's Gelman website and the public comment period was announced.

The DEQ calendars published on June 28, 2004, and July 12, 2004, announced the DEQ's public meeting to take oral and written comment on July 28, 2004 in Ann Arbor, and the public comment period from July 7, 2004, to August 6, 2004. The DEQ produced a fact sheet summarizing the FS, the DEQ's analysis of the FS, and DEQ's PRA on July 7, 2004. A legal notice announcing the date of the public meeting and brief summary of the FS, along with the DEQ alternative was published in the Ann Arbor News on page G30, on July 25, 2004.

A public meeting was held on July 28, 2004, in the Slausen Middle School Auditorium, during which time presentations were made, questions were asked and answered, and public comments were taken.

The DEQ attended two additional public meetings sponsored by the City of Ann Arbor on August 4, and 12, 2004, to further answer questions from the public. DEQ extended the public comment period first to August 9, 2004, then to August 16, 2004, in response to the public comment that more time was needed.

The DEQ's Public Comment Responsiveness Summary is attached as Appendix B.

### **DEQ's Preliminary (July 2004) Proposed Remedial Alternative and Evaluation**

The DEQ reviewed each of the alternatives considered in the Feasibility Study individually and in combination with interim responses. The DEQ determined that extraction from the leading edge alone is not as protective of public health, safety and welfare, and the environment as it would be in combination with interim responses. Interim responses would significantly reduce the overall cleanup time and decrease the uncertainty associated with PLS's PRA, thereby limiting the potential for human exposure and unexpected impacts on the plume due to any groundwater withdrawals. The following factors were considered by the DEQ in making its recommendation for the PRA in its Fact Sheet released on July 7, 2004.

#### ***Interim Responses***

The DEQ identified two interim responses that can, and should be implemented prior to efforts to begin extracting groundwater contamination at the leading edge of the Unit E Plume. Due to the size of the plume, the interim responses discussed below are intended to continue in operation as part of the final remedy.

Wagner Road: The DEQ has recently directed PLS to perform an interim response near Wagner Road to prevent further eastward migration of groundwater contamination. This can be accomplished in the near-term with limited additional infrastructure, independent of any decision on a final remedy. This can also likely be accomplished using the existing treatment system and available discharge capacity without compromising the ongoing cleanup of the shallower aquifers. Attaining capture any farther east using the existing

system would be significantly more difficult due to the wetlands immediately east of Wagner Road.

Maple Road: Additional interim response at Maple Road is also warranted, as there is a significant change in the geology east of Maple Road that has an unexplained impact on the migration of contamination. The known concentrations of 1,4-dioxane east of Maple Road (except MW-79 on the east side of Maple Road) are significantly lower than what is found west of Maple Road. For this reason, capture of the contamination at Maple Road will significantly reduce the uncertainty involved in extracting only at the leading edge. However, extraction to capture the Unit E Plume at this location cannot begin until a discharge method that has the capacity to accommodate the necessary volume of water is secured. Because of the importance of decreasing the migration of contamination to the east of Maple Road as soon as possible, the DEQ recommended that consideration be given to determining if the storm or sanitary sewer could be used on a temporary basis for discharge of treated groundwater using PLS's mobile ozone/hydrogen peroxide treatment system. This treatment system can treat up to 200 gpm of extracted groundwater.

### ***Discharge Methods***

Securing a reliable method for discharge of treated groundwater has been difficult throughout the history of the Gelman site, and the difficulty in doing so has often delayed implementation of response actions. For this reason, it is essential to identify a lawful, safe and reliable discharge method that is reasonably implementable.

In Situ Option: As discussed in the FS, *in situ* (in place) treatment of groundwater would reduce or eliminate the need to extract groundwater, as treatment would take place underground. Unfortunately, no *in situ* technology has been adequately developed to reliably treat such a large volume of water for this contaminant.

Reinjection Options: The FS examined several groundwater reinjection options, two of which survived the initial screening process. As indicated under the DEQ's analysis of those alternatives, the DEQ does not consider groundwater reinjection to be a feasible discharge method for technical reasons. These technical reasons include: 1) the unknown capacity of the aquifer to accept the amount of water that would need to be extracted and reinjected; 2) the unknown effects on the plume due to the complex geology; and 3) the probability that previous problems with fouling of the injection wells will reoccur, thereby resulting in interruptions in extraction that could allow the plume to move beyond the extraction wells. In addition, it appears the public may not support reinjection that could increase the area of groundwater impacted by low levels of contamination (1-85 ppb), as may be the case with Alternatives 3c and 4c. Reinjection would only be feasible if further investigation, coupled with intensive performance monitoring of reinjection, could alleviate the DEQ's concerns.

Surface Water Options: Several surface water discharge options have also been considered. There are several factors that raise questions about the feasibility of an increased discharge to the Honey Creek Tributary, including the capacity of the tributary to handle a doubling of the discharge volume. The use of the Allen Drain and the sanitary sewer were considered in the FS, and were eliminated for various reasons. Neither the Allen Drain, nor the sanitary sewer, which eventually flow to the Huron River, have the



capacity to allow for a continuous discharge of the volume of water necessary for remediation of the Unit E Plume.

As a result, the only remaining feasible discharge option is a surface water discharge to the Huron River. Due to the distance to the Huron River, extensive lengths of pipeline would be required to transport extracted groundwater (from the leading edge and Maple Road), first to a treatment location via a double-walled pipeline, then to the Huron River for discharge at a location downstream from the City of Ann Arbor's water supply intake. Although the installation of pipelines can be disruptive to the community, this is a relatively short-term inconvenience and could be accomplished using standard engineering and construction techniques, including horizontal boring in appropriate locations to minimize disturbance. The location of the treatment system and the route of the pipeline depicted in the DEQ's Fact Sheet was for discussion purposes, and was not a determination that these are the most suitable pipeline routes.

In summary, based on the DEQ's analysis through July 7, 2004, of the relevant criteria and available information, the DEQ proposed a remedial alternative that combined PLS's Alternative 4a with additional interim responses at Wagner Road and Maple Road. The location of the new treatment system was proposed to be in the vicinity of the Maple Village Shopping Center.

#### **DEQ's September 1, 2004 Selected Remedial Alternative for the Unit E Plume**

The DEQ has reviewed the public comments received, performed additional analysis, and has concluded that, under the present circumstances, the final remedy for the Unit E Plume should be slightly modified from that proposed in the DEQ's Fact Sheet released on July 7, 2004. In order to provide the best balance of criteria outlined in Part 201, the DEQ has determined that interim responses (extraction and treatment of contaminated groundwater in the vicinity of Wagner Road and Maple Road), coupled with capture of the "leading edge" of contamination, is necessary to comply with Part 201 and the CJ. The performance objective for the groundwater extraction in the vicinity of Maple Road and Wagner Road is that, a hydraulic barrier be created to halt the further migration at each location of concentrations of 1,4-dioxane above 85 ppb in the downgradient or easterly direction.

PLS should immediately conduct additional investigation of the Unit E Plume in the vicinity of Wagner Road to determine the necessary volume and flow rate to achieve the above performance objective. The DEQ's June 29, 2004, letter to PLS on this subject is currently under the dispute resolution process outlined in the CJ. The parties have agreed to extend the period of informal negotiations while PLS performs additional investigation to determine what response actions would be needed to create a hydraulic barrier at Wagner Road. Disposal of treated groundwater from the Wagner Road area should take place at the PLS groundwater treatment facility. If the volume of water necessary to be extracted to meet the performance objective outlined above is greater than the existing unutilized capacity of the groundwater treatment facility, the DEQ recommends that a reduced pumping rate from shallower groundwater units be allowed by the Court to free up necessary capacity to achieve the performance standard. This would require modification of the Court's order approving the Five-year plan, the objectives of which the DEQ believes will not be met by the July 2005 deadline, regardless of any reduction in extraction from

the shallower aquifers, to accommodate increased extraction from the Unit E Plume. The DEQ- approved groundwater modeling may be necessary to predict the minimum pumping rate necessary to maintain hydraulic capture of shallower unit contamination.

Treatment of contaminated groundwater in the Maple Road vicinity should take place at a newly constructed groundwater treatment facility. The DEQ has considered comments from the public and PLS regarding the location of this new treatment system at or near the MVSC and has obtained additional information about the operation of such a system. The DEQ recognizes that the MVSC may not be an ideal location; however, it is not clear that an ideal location exists. The DEQ believes it is feasible to construct and operate a treatment system at the MVSC, but recommends that alternate locations be explored. The treatment technology type for the Maple Road area action should be the ozone/hydrogen peroxide method, if subsequent remedial design work determines this method will be likely to achieve anticipated National Pollutant Discharge Elimination System (NPDES) permit requirements. If the ozone/hydrogen peroxide technology is unable to achieve the necessary treatment standards, then the treatment method should be the currently employed ultra-violet/hydrogen peroxide method. Disposal of treated groundwater from the Maple Road area treatment system should be to the Huron River, via transmission pipeline, with the outfall located downstream from the City of Ann Arbor's drinking water intake.

The additional interim responses described above are similar to those proposed by PLS, with the additional objective of cutting off the migration of groundwater contamination east of Wagner Road and east of Maple Road. This would effectively cut the plume into three sections, and significantly reduce the amount of time needed to clean up the contaminated aquifer, reducing the threat to public health, safety and welfare, and the environment, and addressing the uncertainties that make PLS's PRA unacceptable. In addition, the reduction of time to remedy the contamination, in comparison to PLS's remedial alternative, would offset, to some degree, the additional capital costs required for the DEQ's PRA. Because PLS's PRA is not protective, the relative costs cannot be used as a basis for the choice between the two remedies.

The DEQ also recommends that temporary use of the sanitary and/or storm sewer for disposal of treated groundwater from the Maple Road area should be pursued, as there is some limited capacity in the sewers that are available during dry weather. This would serve to reduce the migration of higher concentrations to the east while the infrastructure necessary for the final remedy is put in place. This option should be pursued concurrently with determining the best location, and securing access for, a treatment system and discharge pipeline, and investigation to better characterize the geology at the leading edge of the plume.

PLS must also perform a hydrogeological investigation at the leading edge of the contamination to determine the location and number of extraction wells necessary to capture the leading edge of the Unit E Plume in excess of 85 ppb. The investigation must be performed on a schedule that will ensure that extraction, treatment and discharge of groundwater from the leading edge can be implemented once a DEQ-approved work plan for the Maple Road extraction system is implemented.

The DEQ has considered public comments regarding the need for a stochastic groundwater model and agrees that such a model could be an important tool for designing and evaluating response activities. An expert consulting firm is needed to evaluate the dataset to determine if it is adequate to conduct a stochastic modeling analysis. If the DEQ determines that stochastic modeling can be done, this model must be completed and submitted to the DEQ. This model would serve three functions: 1) provide information to monitor and assess the effectiveness of the Unit E Plume response activities; 2) serve as an important tool for the evaluation and optimization of the Unit E Plume response activities; 3) provide useful information for the design and implementation for PLS's proposed alternative, if that's the eventual decision, in which case additional data would need to be collected east of Maple Road.

The DEQ's PRA would require monitoring of the Northwest Supply well to ensure that the GRCC protective for drinking water is not exceeded. Of the six conditions that would have to be met for PLS's alternative to be approved, the potential impact to the Northwest Supply well is the only one that remains relevant to the DEQ's PRA. The DEQ's PRA is preferable because it reduces technical uncertainties associated with other remedial alternatives, achieves cleanup objectives more quickly, and is more readily implementable than PLS's PRA. Although the DEQ has not done a detailed analysis of the length of time to achieve cleanup using its PRA, the DEQ believes the cleanup can be achieved within 20 years. PLS's leading edge alternatives were also estimated to take 20 years to achieve cleanup. If a detailed analysis were done of the DEQ's PRA, compared to any of PLS's leading edge alternatives, there is no question that the DEQ's alternative would be completed in a significantly shorter length of time.

The DEQ has determined that, absent PLS satisfying the minimum conditions set forth below (as modified from DEQ's July 2004 conditions), implementation of the DEQ's PRA is necessary to satisfy the threshold criteria of protection of the public health, safety, welfare and the environment; and compliance with applicable or relevant and appropriate, rules, criteria, limitations and standards of applicable environmental law. However, the DEQ is sensitive to the numerous public comments received that do not support the "leading edge" portion of the DEQ's preliminary PRA. The DEQ is also aware that the City of Ann Arbor has initiated a claim against PLS to replace the Northwest Supply well. In light of the number of currently unresolved issues, the DEQ believes there may an opportunity for PLS to satisfy the conditions set forth below, and, as a result, is willing to allow a limited amount of additional time for PLS to meet these conditions.

1. Abandonment of the Northwest Supply well and elimination of the associated wellhead protection area designation by the City.
2. Prevention of any further migration of 1,4-dioxane contamination beyond Maple Road in excess of 2,800 ppb (the criterion protective of surface water).
3. Having an acceptable institutional control for relevant portions of the Gelman site, by September 1, 2005. The institutional control must address the deficiencies in the WCRRPG identified in the DEQ Interoffice Communication dated August 18, 2004 (Appendix C), including abandonment of any existing water supply wells that are within the area to be restricted by the institutional control and provision of a permanent alternate water supply.

4. A DEQ-approved plan for monitoring any water supply wells that are outside the area covered by an institutional control that are later found to be threatened with contamination by subsequent investigations to determine the fate of the plume, and a contingency plan to prevent unacceptable exposure if water supply wells are affected.
5. A DEQ-approved groundwater monitoring plan to ensure that contamination above the GRCC protective for drinking water does not underflow the Huron River, with a contingency plan to address any such contamination.
6. Provide for acceptable disposal of the treated groundwater from the Maple Road interim response, by providing sufficient hydrogeological information to resolve concerns about reinjection, and/or by shifting to an alternate means of disposal.

If these conditions can be satisfied, capturing the leading edge of the plume would not be necessary to satisfy Part 201 criteria. PLS has indicated to the DEQ that it may be able to satisfy the conditions within one year. However, efforts by PLS to satisfy the conditions should not result in a delay of implementing the DEQ's selected remedial alternative, in the event that PLS's efforts to satisfy the conditions fail. Therefore, PLS must take the following steps, concurrently with any efforts to satisfy the specified conditions:

1. Submit a schedule by October 1, 2004, that specifies implementation of interim response measures that will result in achieving capture of 1,4-dioxane in excess of 85 ppb at Wagner Road by March 1, 2005;
2. Determine whether temporary use of the storm and/or sanitary sewer during dry weather is feasible for discharge of some quantity of groundwater extracted at MVSC. If discharge to the sewer(s) is feasible then PLS should treat on location using an approved treatment technology. The PLS mobile ozone/hydrogen peroxide treatment system, if approved, and additional unit or units, should be used if sewer capacity is greater than 200 gpm, provided that any public safety issues associated with these treatment units can be addressed.
3. Identify a feasible location for a treatment system adequately sized to treat groundwater extracted from the vicinity of Maple Road and the leading edge by September 1, 2005.
4. Identify feasible routes for a pipeline from the Maple Road area to the treatment system and then to the Huron River downgradient of the City's water supply intake by September 1, 2005.
5. Submit a plan to the DEQ, by September 1, 2005, for securing access for the treatment systems and pipelines, that will result in PLS securing access for that infrastructure by March 1, 2006.
6. Hire a DEQ-approved expert consulting firm to provide an assessment, by December 1, 2004, of the Unit E Plume dataset to determine if it is adequate to conduct the stochastic modeling analysis. If the DEQ determines, based upon the firm's recommendation, that stochastic modeling can be done, this model must be completed and submitted to the DEQ by April 1, 2005. If the modeling firm determines the dataset is not adequate, the firm shall identify the deficiencies of the dataset to the DEQ.

If, by September 1, 2005, the conditions outlined on pages **15 and 16** have not been satisfied, PLS must then take the remaining steps necessary to implement the DEQ's selected remedial alternative. The exact timing and sequence of events cannot be

determined at this time; however, extraction at the leading edge should not begin until the extraction in the Maple Road area is operating according to a DEQ-approved work plan. These steps include, but are not limited to, the following, subject to DEQ approval:

1. Complete the plan and design for achieving capture at Maple Road;
2. Complete the plan and design for achieving capture at the leading edge;
3. Enact a monitoring plan at each location to verify capture;
4. Develop a contingency plan to be implemented if the objectives of any of the three Unit E capture systems are not being met. This plan must include identification of “trigger criteria” that initiate utilization of the plan and a schedule for implementation of the contingency plans;
5. Work with the DEQ and the City of Ann Arbor to revise the existing Citizen Involvement Plan (CIP). This revised CIP must inform residents and other stakeholders in the area to be affected by remedial actions about planning and remedy implementation.

This concludes the DEQ’s analysis and selected remedial alternative.

# *EXHIBIT D*

## **Pall Life Sciences' Supplemental Filing In Support Of Pall Life Sciences' Remedial Alternative**

### **I. Introduction**

On June 1, 2004, Pall Life Sciences (“PLS”) submitted its Final Feasibility Study (“FS”) to the DEQ. The FS was intended to provide a framework for evaluating the need for, and the potential benefit of, various response action alternatives for addressing the Unit E contamination. PLS’ analysis revealed a number of significant factors that PLS considered in designing its preferred remedy. These factors included:

- All available groundwater data indicate that the Unit E plume will migrate to the Huron River at a point that is well downstream of the City’s Barton Pond water intake.
- There are no private drinking water wells between the leading edge of the Unit E plume and the Huron River. The entire area is already serviced by the City of Ann Arbor’s municipal water system, which obtains the majority of its water from the Huron River, well upstream from the Unit E plume.
- The only municipal drinking water well in the vicinity of the plume – the Northwest Supply Well – has already been taken out of service due to “water quality concerns” either because of the trace levels of 1,4-dioxane detected in the well in February 2001 or because arsenic is also present in the well at levels almost twice the legal limit.
- Arsenic has also been detected in other areas of the Unit E at levels far above the legally permissible level, calling into question the usefulness of this aquifer as a source of drinking water.
- The recently adopted Washtenaw County Rules and Regulations for the Protection of Groundwater (“Washtenaw County Rules”) effectively prevent the installation of any new drinking water wells in the migration pathway of the plume.
- The “groundwater/surface water interface” (“GSI”) criterion of 2,800 ppb is the next most restrictive cleanup criterion once the drinking water pathway is eliminated.
- Even without any active remediation, it is extremely unlikely that concentrations in the plume would even approach the GSI criterion by the time the plume reaches the Huron River.
- Any attempt to capture the entire width of the Unit E plume, either at the leading edge or another location, would require the installation of miles of pipeline, which would disrupt the congested residential neighborhoods and retail businesses in the area.
- The incredible disruption associated with capturing the plume would serve no purpose because the water is “unsafe” only if it is going to be consumed, and it is already illegal to do so.

Based on these considerations, PLS identified a remedy that was both protective of human and environmental receptors and respectful of the community. PLS’ remedy

focused on reducing concentrations at two locations so that the plume will pose no threat to receptors by the time it reaches the Huron River. In PLS' judgment, the location of this plume makes it inappropriate to blindly adhere to Part 201's default prohibition on allowing the plume to expand. PLS' focus on protecting receptors through mass reduction rather than containment allowed PLS to minimize the infrastructure associated with the remedial system and to locate the reduced infrastructure away from congested residential areas.

After reviewing the FS, the DEQ submitted its Decision Document to this Court on September 1, 2004. While the formality of the document and the excessive use of mandatory language can give the impression that the parties are at loggerheads, the reality is not so dire. The DEQ concluded that, as a legal matter, it could not approve PLS' alternative as a *final remedy* based on the current state of affairs. But the DEQ agreed that PLS' remedy could be a legal, approvable, and protective final remedy if six identified conditions could be met. The most significant issues that prevented the DEQ from approving PLS' remedy are legal in nature rather than technical. The DEQ gave PLS one year to resolve these issues. In the event PLS was unable to satisfy these conditions, the DEQ concluded that PLS should be required to implement the much more invasive and controversial remedy described in the Decision Document.<sup>1</sup>

After reviewing the DEQ Decision Document and PLS' status report, this Court indicated that it did not believe that it was appropriate to wait a year before determining what would be done as a final response for addressing the Unit E. This Court indicated that it would modify its REO to address the Unit E contamination within 60 days of the September 8, 2004 hearing. The Court invited the parties to submit additional materials if they wished, particularly to address the questions raised by the Court during the hearing. PLS appreciates the opportunity to submit the following report and attached materials.

## **II. Questions Raised by the Court.**

This Court asked the parties to address four specific questions raised during the September 8, 2004 Status Conference. The first three inquires relate to several of the six conditions that the DEQ indicated PLS would have to satisfy before PLS' remedy could be approved. The fourth concerns the parties' respective positions regarding the work at Wagner Road. PLS' response to each is indicated below.

### **A. What is the Technical Basis for the DEQ's Concerns Regarding PLS' Plan to Reinject Treated Groundwater near Maple Road?**

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<sup>1</sup> PLS has submitted detailed comments on DEQ's plan, and has provided in Attachment A a list of disputed conclusions in the Decision Document along with explanations as appropriate. As noted in Attachment A, DEQ's contingency is subject to several significant unknowns, which it should also have identified as conditions to its own plan. These include the layout of the pipelines, the limits of an NPDES permit to the Huron River, and the feasibility of siting, constructing and operating a 1300 gpm treatment system in the Maple Road area.



PLS is proposing to reinject the purged groundwater after treatment via two injection wells located to the north and to the south of the extraction well along Wagner Road. The DEQ has responded that PLS must provide “sufficient hydrogeological information to resolve **concerns** about reinjection” and that PLS must identify an acceptable method of disposing of the treated groundwater.

During the recent status hearing, the Court asked the DEQ to identify the technical basis for its concerns. PLS has met twice with DEQ’s technical staff, once in person just prior to the status conference and once after the conference via a conference call. The DEQ has been unable to identify what additional information it wants PLS to submit in this regard.

PLS strongly believes that it is not necessary to “study this to death” and that the available information provides a sufficient basis for approving this disposal method. PLS has numerous monitoring wells in the Maple Village area and has conducted two aquifer pump tests to determine aquifer characteristics in this area. PLS has submitted all of this data to DEQ. PLS has also submitted its Modeling Report (Exhibit 1) that addresses the DEQ’s original concerns and demonstrates that the proposed reinjection will not adversely affect the plume. The modeling also shows that the proposed extraction will significantly reduce the contaminant levels that might otherwise migrate past Maple Road. PLS agrees with the DEQ that, given the size of the plume, it would be very problematic and likely impossible to reliably reinject the volume of water needed to capture the entire width of the plume, let alone the volume needed to capture it twice as the DEQ has proposed. The existing information, however, demonstrates that PLS’ more realistic plan is technically feasible. Therefore, PLS believes this condition has already been met.

PLS’ work plan for implementing its proposed interim response is ready to be submitted to the DEQ for approval. PLS is simply waiting for DEQ to identify what additional information it needs in order to satisfy DEQ’s unarticulated technical concerns in this regard. If necessary, PLS will attempt to address any reasonable data requests, but PLS believes that its work plan is currently approvable.

B. Can a Judicial Order be Used to Satisfy the DEQ’s Institutional Control Requirement?

The DEQ contends that in order for PLS’ remedy to be protective, an institutional control must be in place that would prevent use of the groundwater in the “relevant areas” of the site.<sup>2</sup> To the extent an institutional control under Section 18 of Part 201 (MCL 324.20118) is required in order for the DEQ to approve PLS’ remedy, the current Washtenaw County Rules already substantively accomplish this. The Washtenaw County Rules already reliably restrict the installation of new water supply wells in the areas affected by the Unit E plume under the following provisions:

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<sup>2</sup> As set forth in PLS’ FS, the DEQ has authority under Section 18 to waive its aquifer control rules without the need for institutional controls. PLS attempted to demonstrate how this could be done in its FS, but the DEQ has declined to use that authority.

- No one can construct or drill any well (including a drinking water well) without first obtaining a permit from the County Health Office (Sec. 2:1);
- No municipality within the county may issue a building permit where a well is necessary or allow construction to commence on any land where an approved public or private water supply is not available until issuance of a permit by the Health Officer (Sec. 2:4);
- No permit can be issued by the Health Officer if it is not in compliance with the Rules or if it would create a dangerous or unsafe condition (Sec. 2:5);
- It is unlawful for any person to occupy or permit to be occupied any premise in Washtenaw County not equipped with an adequate supply of potable water as determined by the Health Officer (Sec. 6:1);
- The rules apply to all non-community and private groundwater supplies within Washtenaw County (Sec. 6:2);
- Water supplies intended for human consumption that are not “potable” must either be abandoned, identified at the outlet as unfit for human consumption, or treated by methods approved by DEQ or the County Health Officer so as to make the water potable (Secs. 6:2, 6:3). “Potable” water is defined as water that is free of contaminants in concentrations that may cause disease or harmful physiological effects, is safe for human consumption and meets the State drinking water standards set forth in the Michigan Safe Drinking Water Act (Sec. 1:15);
- Newly drilled wells cannot be used for human consumption until approved by the Health Officer and after they have been tested for bacteriological or chemical contaminants (Sec. 6:6); and
- No well can be located within at least 100 feet of a source of contamination, or within such increased distance as determined necessary by the Health Officer (Sec. 6:7).

This existing institutional control already prohibits the installation of water wells in the affected areas. The DEQ acknowledges that the County Rules already prohibit property owners between the plume and the river from installing new water supply wells.<sup>3</sup>

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<sup>3</sup> DEQ staff explained the issues they have with the ordinance in a memorandum attached as Appendix C to DEQ’s Decision Document. DEQ staff acknowledged, however, that many of the specific issues appear to be easily addressed (*e.g.*, provide a map, limit variances to isolation zones, provide more clarity in decision standards). The primary concern expressed in the memo arises from the author’s understanding that there are existing drinking water wells that would be in the area threatened or impacted by “the PLS plumes.” DEQ district staff members more familiar with the site agree that this is not the case with Unit E,

To the extent it is necessary to supplement the existing institutional control, PLS has suggested that this Court could issue an order that would address the minor deficiencies in the existing Washtenaw County Rules. Such an order could also constitute a stand alone institutional control that would meet the requirements of Part 201.

As was acknowledged during the status hearing, Part 201 does not preclude such an order from serving as an acceptable form of institutional control. Part 201 provides, in relevant part:

If the department determines that exposure to hazardous substances may be reliably restricted by an institutional control in lieu of a restrictive covenant, and that imposition of land use or resource use restrictions through restrictive covenants is impractical, the department may approve of a remedial action plan under section 20120a(1)(f) to (j) or (2) that relies on such institutional control. Mechanisms that may be considered under this subsection include, but are not limited to, an ordinance that prohibits the use of groundwater or an aquifer in a manner and to a degree that protects against unacceptable exposures as defined by the cleanup criteria approved as part of the remedial action plan. An ordinance that serves as an exposure control pursuant to this subsection shall be published and maintained in the same manner as zoning ordinances and shall include a requirement that the local unit of government notify the department at least 30 days prior to adopting a modification to the ordinance, or to the lapsing or revocation of the ordinance.

MCL 324.20120b(5) (emphasis added). Similarly, the Part 201 rules define “institutional control” as a “measure” that reliably prevents unacceptable exposures to contamination:

(j) “Institutional control” means a measure which is approved by the department, which takes a form other than a restrictive covenant, and which limits or prohibits certain activities that may interfere with the integrity or effectiveness of a remedial action or result in exposure to hazardous substances at a facility, or which provides notice about the presence of a hazardous substance at a facility in concentrations that exceed only an aesthetic-based cleanup criterion.

Mich Adm Code R. 299.5101(j). Thus, under both Part 201 and the Part 201 rules, a judicial order could be an institutional control provided it was crafted in such a way that it satisfies the identified requirements.

Issuance of such a judicial institutional control is well within this Court’s authority to enforce its judgments. The Michigan Revised Judicature Act provides that “[c]ircuit

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and indicated that the staff person who reviewed the ordinance may have also been looking at other portions of the site that do not need the institutional control.

courts have jurisdiction and power to make any order proper to fully effectuate the circuit courts' jurisdiction and judgments." MCL 600.611. Michigan case law provides that courts possess inherent authority to enforce their own directives. See Cohen v Cohen, 125 Mich App 206 (1983). In addition, courts have stated that circuit courts have broad powers, including the power to make an order to fully effectuate their jurisdiction and judgments. See Spurling v Battista, 76 Mich App 350 (1977).

This Court's authority under the RJA is analogous to the authority granted to federal courts under the federal All Writs Act, 28 USC 1651, which states that "courts established by Act of Congress may issue all writs necessary or appropriate in aid of their respective jurisdictions and agreeable to the usages and principles of law." Federal case law has held that "the All Writs Act provides district courts with the authority to bind nonparties in order to prevent the frustration of consent decrees that determine parties' obligations under the law." United States v City of Detroit, 329 F 3d 515 (CA 6 2003); see also Grand Traverse Band of Ottawa & Chippewa Indians v Director, Michigan Dep't of Natural Resources, 141 F 3d 635 (CA 6 1998) (affirming district court order barring non-parties from interfering with consent judgment). In City of Detroit, the Sixth Circuit held that the district court acted properly in ordering the United States Army Corps of Engineers to accept dredged sediment in connection with a consent judgment between the United States and the City of Detroit requiring the City of Detroit to bring its wastewater treatment system into compliance with its NPDES permit. Id.

Thus, this Court has authority to bind third parties as part of a enforceable judicial institutional control. Based on a review of these requirements and comments made by DEQ staff on the Washtenaw County Rules, PLS recommends that the following elements be included as part of an order imposing institutional controls:

1. The requirement that the parties confer and submit to the Court within a specified period of time a map that identifies the agreed upon area that would be covered by the judicial institutional control, including a buffer zone (the "Protected Area"), or if agreement cannot be reached, the parties' respective positions.
2. A prohibition against the installation of new water supply wells for drinking, irrigation, or commercial or industrial use, within the Protected Zone shown on the map.
3. Service of the Order on the Washtenaw County Health Department with the instruction prohibiting the County Health Officer from issuing permits for well construction in the Protected Zone. It should be noted that this prohibition is completely consistent with the existing County Rules governing issuance of permits.
4. A prohibition against consumption or use of groundwater from within the Protected Zone.

5. A requirement that PLS provide, at its expense, connection to the City of Ann Arbor municipal water supply for any existing private drinking water wells within the Protected Zone.
6. A requirement that the Order be published and maintained in the same manner as a zoning ordinance.
7. A provision that the Order shall remain in effect until such time as it is amended or rescinded by further Order of the Court, with a minimum 30 days notice to all parties, including specifically DEQ.
8. A provision to allow either party to move to amend the boundaries of the prohibition zone to reflect material changes in the boundaries or fate of the plume as determined by future hydrogeological investigations and/or monitoring.

An order that contains these elements would appear to be sufficient to reliably restrict groundwater use consistent with PLS's proposed response.

C. What Water Supply Wells Should PLS be Required to Monitor?

PLS agrees that its remedy should include a monitoring plan for any water supply wells outside the area covered by the institutional control that are conceivably threatened with contamination. The number and location of the wells that would need to be monitored would be dependant on the area to be covered by the judicial institutional control. PLS would anticipate, however, that wells on the east side (and in the vicinity of) the Huron River would eventually be monitored. PLS' monitoring plan would also include "sentinel wells" near the Huron River. PLS also anticipates that the Northwest Supply Well would be monitored (as it would be under the DEQ's contingent remedy). PLS' remedy includes a contingency plan to prevent unacceptable exposures if any such water supply wells are threatened. PLS has also, consistent with its proposal (and with one of DEQ's conditions), submitted a work plan for a downgradient investigation of the Unit E plume. (Exhibit 2). These wells may also be available for monitoring as a way of confirming the boundaries of an institutional control.

D. What Should be Done at Wagner Road?

The one aspect of PLS' proposed remedy on which the parties are in clear disagreement is the Wagner Road element. PLS has proposed to continue its on-site purging and to conduct an investigation in the Wagner Road area to determine if concentrations in this area are high enough to justify an additional purge well. PLS is not proposing to capture the entire width of the plume at this location because it serves no useful purpose to do so. Rather, PLS has proposed to reduce concentrations at this location, depending on the results of the pending investigation. The DEQ initially approved this mass reduction objective, but later asserted that PLS should attempt to capture the entire width of the plume at this location.

Capturing the width of the plume using conventional pump and treat technologies is, according to DEQ, a preferable remedy because DEQ “believes” it will accelerate groundwater cleanup horizons. As will be explained in more detail below, pump and treat technologies are not suitable for this objective. There is no basis for DEQ’s assumption that its proposal would result in attaining the cleanup criteria any sooner than PLS’ proposal. The most efficient mid-plume remedial technique is mass reduction in areas of high concentration, not containment. This is what PLS is doing in the C3/D2 plume (*e.g.*, the horizontal well).

PLS also is very concerned that a “capture” objective cannot be directly verified. Currently, hydraulic capture at other areas of the site is enforced through minimum purge rates and by monitoring verification wells to show that the plume is not “escaping” hydraulic capture. Monitoring downgradient of the barrier, however, cannot be used to verify compliance for Wagner Road. This is because there are significant concentrations of 1,4-dioxane in the ground on both sides of the hypothetical barrier. Monitoring wells installed ahead of the barrier will not be able to verify that the barrier is operating as designed. This puts PLS in a perilous position if capture becomes an enforceable objective. Relying only on minimum purge rates is really no different than mass reduction, which is what PLS has proposed.

The unilateral change in performance objectives would also directly conflict with PLS’ obligations under this Court’s REO. Although the exact capture volume is unknown, it will undoubtedly exceed the available capacity under the NPDES permit unless more capacity is diverted from the D2/C3 cleanup effort. PLS has already allocated approximately 180 gpm of the 1300 gpm capacity allowed under the permit to its on-site extraction wells. Because of decreasing water levels in the C3 and D2 aquifers (and resulting decrease in purge rates), there is still a small amount of capacity that can be allocated to mass removal at Wagner Road if concentrations in this area justify that response. What the DEQ has proposed, however, will greatly exceed the available capacity and would require PLS to choose between attempting to comply with the Court’s REO and complying with the DEQ’s proposed interim response.

PLS urges the Court to allow PLS to move forward with its groundwater quality investigation. If concentrations justify additional mass removal, PLS will install an additional well and connect it to the existing treatment system. There is, however, no basis for the DEQ’s plume capture performance objective.

### **III. Satisfaction of DEQ Conditions.**

PLS urges this Court to address the most problematic prerequisite to approval of PLS’ remedy – the institutional control requirement (Condition 3). Issuance of a judicial institutional control would greatly benefit the community as a whole and spare residents the disruption and safety concerns associated with any other plan. If this condition is satisfied judicially, PLS’ plan is readily approvable now, not a year from now. PLS has already agreed to Condition 2 (containment of 2800 ppb contour at Maple Road as a

performance objective) and Conditions 4 and 5 (monitoring of potential receptors and contingency plans). As discussed above, PLS believes that Condition 6 (acceptable disposal option for treated water at Maple Road) has already been met and is willing to attempt to address any reasonable requests for additional data to confirm that reinjection is feasible at this location. The only remaining condition, then, is the DEQ's insistence that the Northwest Supply Well be abandoned (Condition 1).

PLS strongly disagrees with DEQ's conclusion that formal abandonment of the Northwest Supply Well is a legal barrier to approval of PLS' proposed remedy. This condition arises from the DEQ's unpromulgated internal policy against allowing expansion of the plume within a designated wellhead protection area. This should not be considered a condition of approving PLS' plan for the simple reason that the City has effectively abandoned the well already. The City discontinued operation of this well in February 2001 when it detected concentrations of 2 ppb of 1,4-dioxane. Given the City's very public position that any detectable levels of 1,4-dioxane are not acceptable, it cannot reasonably be expected that the City will ever use that well. Moreover, the well is independently contaminated with naturally occurring arsenic at levels above the allowable limit of 10 ppb. The City's own sampling data from 2002 confirms that the well contained 18 ppb of arsenic. (Exhibit 3). The City claims to have abandoned its well because it detected 1,4-dioxane – a “suspected carcinogen” – at levels 40 times lower than the cleanup standard. It necessarily follows that the presence of arsenic – a “known carcinogen” – at levels well above the cleanup standard would independently cause the City to abandon its well.<sup>4</sup> Under these circumstances, the DEQ's internal policy is irrelevant and should not drive remedial decisions.

In addition, the City has already sued PLS and is contending that PLS must pay to replace the well because it is no longer useable. The issue of proper compensation, if any, will be resolved shortly in that litigation. It would be inappropriate to reject a proposed remedial alternative that is otherwise protective based on the existence of a well that has in fact been abandoned. Certainly, PLS would urge the Court to refrain from ordering PLS to implement the DEQ's draconian and unsafe remedial alternative before the significance of this well is decided in the pending litigation.

#### **IV. Additional Factors that Militate in Favor of PLS' Suggested Remedy.**

PLS would ask the Court to also consider the factors discussed below when determining the proper course of action.

##### **A. Timeliness**

PLS' plan has the advantage of being timely. In addition to avoiding the multi-year effort needed to build pipelines three to four miles long, PLS' proposed plan incorporates the only discharge method that would not require a discharge permit and that

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<sup>4</sup> The City's sampling arsenic result is consistent with preliminary sampling PLS conducted in other monitoring wells in the Unit E aquifer, which showed elevated arsenic levels well above the federal MCL at multiple locations.

can be implemented without requiring access to significant numbers of properties. PLS' proposed groundwater reinjection is authorized under Mich Adm Code R. 323.2210(u)(ii) and does not require a NPDES, deepwell injection, or groundwater discharge permit. DEQ's proposal, and any other discharge scenario, requires issuance of a permit that can and, given the history of this site, will be challenged in a contested case proceeding.

Once access for the treatment system and the limited amount of necessary infrastructure is obtained, PLS can install its Maple Road purge system within 4-6 months. PLS' ability to promptly address the Maple Road area is important because it allows PLS to prevent the much higher concentrations west of Maple Road from migrating into the congested residential areas to the east.

Moreover, it is unlikely that the DEQ's contingent plan would achieve the applicable cleanup criterion any sooner than PLS' plan. The DEQ claims that by segmenting the plume, its plan will shorten the cleanup horizon. This theoretical advantage has been repudiated by the experience of experts in the field. It is well known in the professional community that pump and treat approaches in all but very simple situations typically cannot fully attain groundwater restoration (health based goals) throughout a plume no matter how long the system is operated. The main reason is the phenomena of "tailing" and "rebound." This is described in guidance for pump and treat systems put out by USEPA for superfund sites. *Pump and Treat Groundwater Remediation, A Guide for Decisionmakers*, USEPA, July 6, 1996 (EPA/625/R-95/005), available at <http://www.epa.gov/ORD/NRMRL/pubs/625r95005/625r95005.pdf>. Tailing and rebound will, in situations such as this one, which involves multilayered heterogenous geology, frustrate any cleanup goal for Unit E that is based on attaining criteria throughout the aquifer. Thus, there is no basis for DEQ's assertion that more pumping at the interior of the plume will attain criteria "faster" than PLS' plan.

B. The DEQ's Contingent Remedy is Not Legally Required or Feasible.

1. There is no legal basis for DEQ's Plan.

The DEQ has taken the position that PLS is required to remediate the Unit E under the 1992 Consent Judgment. Specifically, the DEQ asserts that PLS is required to remediate the Unit E plume, which has migrated *east* from the Wagner Road facility under the Consent Judgment provisions regarding the *Western* System, which provide:

**Western Plume System**

(hereinafter AWestern System@)

1. Objectives. The objectives of the Western System are: (a) to contain downgradient migration of any plume(s) of groundwater contamination emanating from the GSI Property that are located outside the Core Area and to the northwest, west, or southwest of the GSI facility; (b) to remove groundwater contaminants from the affected aquifer(s); and (c) to remove all groundwater contaminants from the



affected aquifer or upgradient aquifers within the Site that are not otherwise removed by the Core System provided in Section V.B. or the GSI Property Remediation Systems provided in Section IV.

Consent Judgment, Section V.C.1 (emphasis added).

PLS does not concede that the Consent Judgment requires PLS to remediate the Unit E. To this point, PLS has been willing to move forward with the investigation and remediation of the Unit E without engaging a legal effort to contest responsibility.<sup>5</sup> But even if the Consent Judgment was applied to this new area of contamination, it provides no support for a plan that requires three separate capture zones. The only interim response/source control required by the Consent Judgment is contained in Section V.B.1, which relates to the “Core Area” – the portion of the shallow C<sub>3</sub> aquifer that contains contamination above 500 ppb. The Consent Judgment contains no interim response requirements that could possibly apply to the Unit E. There is no remedial objective or other requirement in the Consent Judgment that could be construed to require the type of program envisioned by DEQ. The most the Consent Judgment could be interpreted to require would be containment of the leading edge – a remedial objective that neither the City of Ann Arbor nor its citizens want implemented.

DEQ also claims that its proposal is supported by Part 201.<sup>6</sup> To the extent it applies, Part 201 does not require interim response on the grand scale suggested by DEQ. The releases at issue all took place well before 1995. Therefore, the source control measures suggested by DEQ would not be required by Section 14(1)(d), MCL 324.20114(1)(d), even if they were “technically practical, cost effective, and [protective of] the environment.”<sup>7</sup> This is particularly true where PLS has already proposed appropriate interim response measures.

Moreover, PLS cannot be required to undertake *any* response activity under Part 201 because the releases that are alleged to have caused the Unit E contamination were “permitted releases.” Part 201 defines a “permitted release” as “a release in compliance with an applicable, legally enforceable permit issued under state law.” MCL 324.20101(aa)(i). After a six-month long trial, this Court’s predecessor, Hon. Patrick J. Conlin, determined that the state authorized the very releases currently at issue pursuant to a series of state-issued wastewater discharge permits. His July 25, 1991 Opinion is attached as Exhibit 4. Therefore, the “permitted release” issue has already been adjudicated as between the parties in favor of PLS. That decision would be binding on

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<sup>5</sup> PLS reserves the right to contest the applicability of the Consent Judgment to the Unit E in the event the DEQ or a Court attempts to compel PLS to implement the DEQ’s proposed remedy.

<sup>6</sup> PLS notes that Part 201 gives a party to a consent judgment entered prior to the 1995 amendments the right to proceed under the consent judgment or under Part 201. MCL 324.20102a(3). Thus, Part 201 would only be relevant to the extent the Consent Judgment does not apply to the Unit E or, if it does, only to the extent PLS chooses to proceed under that statute.

<sup>7</sup> As PLS explained in its FS, interim response activities beyond what PLS has proposed would not satisfy any of these criteria.

the parties under the doctrines of *res judicata* and *collateral estoppel*. Dart v Dart, 460 Mich 573 (1999) (res judicata); Hawkins v Murphy, 222 Mich App 664 (1997) (collateral estoppel).

Part 201 does not require PLS to undertake any response activities to address such permitted releases:

A person shall not be required under this part to undertake response activity for a permitted release. Recovery by any person for response activity costs or damages resulting from a permitted release shall be pursuant to other applicable law, in lieu of this part.

MCL 324.20126a(5) (emphasis added).

Thus the DEQ cannot compel PLS to implement the response activities that it asserts must be undertaken in the event PLS is unable to obtain approval of PLS' proposed remedy.

2. DEQ's plan is not feasible.

PLS has gone to great lengths and expense to avoid embroiling this community in a legal battle over the responsibility for the Unit E. Despite strong legal arguments in its favor, PLS has proposed a responsible and protective remedial alternative and is committed to implement it. What PLS is unwilling to do is to spend tens of millions of dollars to prove what should be clear on its face: the DEQ's contingent remedy is neither feasible nor appropriate.

a. Treatment System

DEQ's contingent remedy would require a Maple Road-based treatment system approximately the same size as the one PLS operates at its facility. To give the Court some perspective on the scale of operation the DEQ's proposal would require, the operational requirements of PLS' current system are instructive.

At the PLS facility, the UV-H2O2 system occupies a dedicated building that is 60 x 115 ft. and can treat 1300 gpm of groundwater contaminated with 1,4-dioxane. It receives shipments via tanker truck every three to four days of sulfuric acid, sodium bisulfite, caustic, and hydrogen peroxide in approximately 20-ton lots. The facility has its own transformer, which consumes approximately 530,000-kilowatt hours of electricity every month. PLS utilizes two 1,000,000-gallon equalization ponds to insure continuous operation and compliance with its stringent NPDES permit requirements. While an ozone/H2O2 system would consume a somewhat smaller volume of chemicals, a system sized to meet DEQ's requirements can be expected to be on a scale of the one that is located already at PLS and, in any event, to be far larger and to consume far more raw materials than the system proposed by PLS for its more realistic Maple Road purging

program.<sup>8</sup>

It is not feasible to place a treatment system large enough to accommodate 1150 gpm required by DEQ's plan in a commercial area. Installing and operating a system that could accommodate 1150 gpm anywhere in the vicinity of Maple Road is not feasible primarily because of three factors: i) the significant health and safety issues associated with liquid oxygen; ii) the physical size of the system; and iii) the absence of any properties in the area that are available and properly zoned for this type of industrial operation.

i. It is Not Safe to Site a Liquid Oxygen-Based Treatment Unit in the Maple Road Area.

A treatment system of this size would require liquid oxygen. PLS does not believe that it is safe to use and store the volume of liquid oxygen that would be needed to treat 1150 gpm of contaminated groundwater in the Maple Road area.<sup>9</sup> PLS estimates that such a treatment unit would require 40,000 cubic feet of liquid oxygen per day. This usage would require construction of a large liquid oxygen storage tank and frequent refilling by a liquid oxygen tanker truck. This use is not appropriate for a highly utilized retail commercial area. That is precisely why PLS designed the mobile ozone treatment unit to utilize a oxygen generator rather than liquid oxygen. Mr. Fotouhi convinced PLS management to adopt this design even though it would have been much cheaper to implement its proposed interim response with a liquid oxygen-based treatment system. (Compare the FS unit cost of treating 1000 gallons for the mobile unit (\$2.64/1000gallons) with the on-site liquid oxygen-based treatment costs (\$0.91/1000 gallons)).

Nor is it feasible to generate enough oxygen (with an oxygen generator) from the atmosphere to reliably treat 1150 gpm. PLS' current **200 gpm** system already utilizes the second biggest oxygen generator on the market. It is not technically feasible to string together six or seven of these units to generate the oxygen needed to treat 1150 gpm. Each oxygen generator would require its own compressor, air dryers, and other associated equipment. From an engineering standpoint, it is not possible to reliably operate such a system on anything approaching a continuous basis.

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<sup>8</sup> DEQ's consultant estimated that their system would be of similar size. The "footprint" for the packaged system and supply equipment was estimated to be a total of 640 square feet, plus a large liquid oxygen tank with vaporizers (which will need containment and security) plus sufficient ground space for trucks to make chemical deliveries and additional ground space to secure the system (fencing, on-site security). (Email from Anne Turne to Mike Pozniak, August 25, 2004, attached as part of Appendix B, Attachment B, to DEQ's Decision Document). This is actually somewhat larger than PLS' facility.

<sup>9</sup> DEQ's vendor acknowledged that liquid oxygen presents significant health and safety issues, but claimed the concerns could be managed by securing the site and following proper liquid oxygen handling procedures. PLS submits this is an appropriate response only if the land is industrial. Zoning prohibits, for health and safety reasons, the location of this type of storage unit in a retail area.

ii. The Treatment System, Including Ponds, Required by the DEQ's Remedy is Too Large to be Accommodated by any Properties in the Wagner Road Area.

For a host of engineering reasons, a system sized to accomplish DEQ's proposed remedial objectives would require the construction of both an equalization ("Red") pond and a discharge ("Green") pond. Without such ponds it is PLS judgment that it would not be able to continuously purge the groundwater (as required to capture) or to meet the stringent discharge requirements of a NPDES permit. Again, this point is driven home by the fact that the treatment system would be essentially the same size as the system PLS operates on site. PLS currently utilizes two 1,000,000-gallon ponds. While it would not be absolutely necessary to have ponds with that volume at an off-site location, it would be prudent to have ponds with a volume of at least 500,000 gallons to accommodate a treatment volume of 1150 gpm. If the performance objective is to capture the entire width of the plume, ponds of this size would be needed to allow for continuous purging during maintenance of the treatment system. Even ponds this large would only provide storage capacity for approximately six hours of continuous operation.

These ponds would be necessary to meet the technical challenges associated with operating a treatment system that would have to meet NPDES discharge limits, 24 hours a day, 7 days a week, and 365 days a year – challenges with which PLS is well familiar. For example, the equalization or "Red" pond would be required so that the entity operating the system could precipitate out the iron in the water. If the iron is not removed prior to treatment, the treatment process would cause the iron to precipitate. In that condition, the iron would readily adhere to the interior of the lengthy pipelines associated with DEQ's proposal. Because of the extreme length of pipeline contemplated, it would not be practical to clean the iron residue from the pipeline to the River. The only practical way to address the iron issue is to precipitate the iron out prior to treatment, and that requires a pond.<sup>10</sup>

Moreover, much of PLS' success in operating a continuous purging/treatment operation is achieved because of the stability its on-site ponds provide. With such ponds, it is possible to maintain the steady volume of water needed to avoid constantly readjusting the calibration of the system, which would prevent the operator from meeting the discharge criteria. An equalization pond is particularly necessary under DEQ's proposal since water will be purged from multiple locations with varying concentrations and water chemistry.

It would also be necessary to have a discharge or "Green" pond to provide assurance that stringent NPDES permit requirements could be met by the treatment system. If effluent sampling shows that limit not satisfied, the operator would be able to re-circulate through the treatment system. Consistent compliance with a hypothetical

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<sup>10</sup> DEQ's vendor acknowledged it had not field-tested its equipment where there is high iron, although it claimed it should not interfere with functioning of its unit. Even if this claim holds true, the iron would still have to be removed to control discharge to the Huron River through a long pipeline.

NPDES permit could not be achieved without such a pond. The Green pond also allows for further iron removal prior to being placed in a three-mile long pipeline.

Under DEQ's proposal, the resulting footprint of the required 1150 gpm treatment system would be far too large to be placed on any property in the vicinity of Maple Road. The treatment unit (even if it was feasible to configure a system that could generate the required amount of oxygen from the atmosphere) would at a minimum replicate PLS' current treatment building, which is approximately 60 X 115 ft. Treatment ponds would require an area of at least 120 X 140 ft. Therefore, even if it was safe to locate a system big enough to accommodate DEQ's remedial objectives it would not be possible to do so in the congested commercial area available.

iii. The DEQ's Proposed Remedy is Not Consistent with Existing Zoning.

Part of DEQ's response plan requires PLS to construct and operate a treatment plant of approximately 1300 gpm capacity in the vicinity of Maple Village Shopping Center ("MVSC") in Ann Arbor. A plant of this size would be an industrial use under Chapter 55 of the Ordinances of the City of Ann Arbor. Attached as Exhibit 5 are maps of the zoning above the Unit E plume from PLS' facility through the leading edge of the plume and beyond. These maps show that no property within the vicinity of MVSC (approximately 1000 foot radius from the proposed capture areas) is properly zoned for the DEQ's treatment plant. Even if one were to expand a search to cover more of the West Side of Ann Arbor, only two small parcels (near Liberty) have an industrial zoning classification. Both properties are too far away to be of practical use, are developed, occupied, and not for sale, and both are too small for a treatment plant that would meet DEQ's requirements. (See Map of Section 930).

Part 201 of NREPA requires that remedies selected by DEQ be consistent with zoning. This question most often arises when a response activity is intended to attain a criterion other than the most restrictive (residential) criterion. However, it is also a significant issue here, where in order to attain residential criteria, DEQ is ordering that property be put to non-residential use for a treatment plant, inconsistent with local zoning and current activity patterns. In this case, it is patently inconsistent for DEQ to insist that local ordinances controlling groundwater use must be made consistent with PLS' remedy, while ignoring zoning ordinances of these same local units of government in the case of its own remedy. Land use controls, including zoning and groundwater use ordinances, must both be examined in evaluating the appropriateness of a response activity plan, both in concept and in attaining cleanup objectives.

Section 20a of Part 201, MCL 324.20120a(6), provides in pertinent part that "the department shall not grant final approval for a remedial action plan that relies on a change in zoning designation until a final determination of that zoning change has been made by the local unit of government." That section also requires that a remedial action plan include documentation that the current property use is consistent with the current zoning or is a legal nonconforming use. While the shopping center use is consistent with

the current zoning, the DEQ's plan is manifestly not, and cannot be legally approved as a final remedy for the site unless and until there is a zoning change approved by the local unit of government. DEQ's administrative rules similarly emphasize that zoning must be consistent with the selected response activity. See Mich Adm Code R. 299.526(6)(b) (final interim responses must be consistent with zoning and land use activity patterns); R. 299.522(7)(d) (requiring DEQ to consider comments from neighbors or the local unit of government that a proposed response activity is inconsistent with current zoning); R. 299.532(8)(b) (a remedial action plan must contain statements and representations regarding current zoning to show consistency with proposed response actions).

DEQ's "Decision Document", its "Public Comment Responsiveness Summary" and the "Executive Summary" say nothing about zoning. The only comments regarding land-use that it responded to were in connection with PLS's plan, where DEQ did not dispute the relevance of this factor but only said it was "premature" with respect to evaluating PLS' contingency plan along the river. (Decision Document at 9). The record is otherwise devoid of any consideration of this issue.

b. Pipelines

Given the history of this site, it is capricious for DEQ to assume that PLS could implement a remedial alternative that requires construction of three to four miles of pipeline (about 1.5 miles of which would be installed within congested neighborhoods). As documented in the FS, these pipelines would cause tremendous disruption in the community, without any corresponding environmental or human health benefit. Recent public hearings/meetings have made clear that there is no public support for such construction among the affected homeowners (to the extent they even received notice of the project). Over 500 homeowners signed declarations and petitions opposing the disruption of their neighborhoods that would be caused by attempting to implement the DEQ's contingent remedy. These petitions were only from persons mobilized by DEQ's incomplete conceptual pipeline map. DEQ acknowledges that it is in fact not possible to know the extent of opposition or disruption until a complete design (all the way to the River) is proposed.

In the Evergreen subdivision, PLS sued the City to obtain access to City right-of-ways to install approximately 1000 feet of pipe. Even though this took place in a situation that demanded the utmost urgency, and even with this Court's intervention, it took over a year to get that 1000 feet of pipe installed. DEQ's proposal would require approximately 16,000 feet of pipeline to be installed in front of hundreds of homes and businesses, through right-of-ways owned by at least three different governmental units. The contemplated pipeline construction would not be feasible or even remotely timely. Even if such a series of pipelines were feasible and access to pipelines voluntarily granted, the construction would take years to complete.

## LIST OF ATTACHMENTS AND EXHIBITS

- Exhibit 1 Modeling Report for ReInjection
- Exhibit 2 Work Plan for Downgradient Investigation
- Exhibit 3 Arsenic data for Northwest Supply Well
- Exhibit 4 Opinion and Order of Judge Conlin
- Exhibit 5 Zoning Maps

Attachment A: PLS Response to MDEQ September 1, 2004 Decision Document

Attachment B: Decision Matrix

ATTACHMENT A  
Pall Life Sciences Response to  
DEQ's September 1, 2004 Decision Document

**Introduction**

DEQ issued its Decision Document on September 1, 2004. To the extent this document represents a final decision of DEQ, PLS is disputing that decision. This document lists conclusions set forth in DEQ's decision document which PLS disputes, the reason for the dispute, and additional supporting materials.

**Cover Letter, Robert Reichel to Honorable Donald E. Shelton, September 1, 2004**

- PLS disputes the conclusion that its proposed remedy as outlined in the FS "cannot be approved by DEQ, based upon the requirements of Part 201 of the Natural Resources and Environmental Protection Act." (Par. No. 1).
- PLS disputes (for the reasons stated below) the remedial alternative suggested by DEQ if PLS cannot meet the six specified conditions within one year. (Par. No. 3).
- PLS disputes (for the reasons stated below) that it must concurrently with pursuing its proposal begin to implement DEQ's alternative. (Par. No. 5).

**Gelman Site Enforcement Activities**

- PLS disagrees with DEQ's characterization of the disposition by this Court of the February 2000 motion by the Michigan Department of Attorney General ("DAG"). (Decision Document, at 3). PLS incorporates by reference its responsive pleadings and testimony in court in connection with its defense of the motion. PLS specifically denies, for the reasons set forth in the referenced documents, the statement in the Decision Document that PLS had not complied with the Consent Judgment. It is not appropriate to present this as a fact when it was contested and this Court did not decide the underlying contentions.

**Unit E Plume**

- PLS disagrees with the DEQ's characterization of the historic data regarding Unit E. Specifically, there is an implication that PLS or other parties knew of, but did not disclose, Unit E contamination before it was found in May, 2001. (Decision Document, at 4). This is not accurate.
- PLS does not agree that the test it conducted on in-situ treatment at MVSC proved that the technology was infeasible. (Decision Document, at 5). PLS agrees the results of the test ruled out use of the technology in the MVSC area based on the conditions of the test. PLS is



still reviewing the potential for in-situ to work in other locations, for other applications at the site, and under different conditions than those imposed by DEQ for the MVSC test.

### **DEQ Analysis of PLS's Proposed Response Action**

- PLS disputes DEQ's characterization of the time that it would take PLS to achieve cleanup criteria using its proposed method. (Decision Document, at 9). Any remedy that involves pump and treat technology to address the Unit E suffers from the same uncertainty in predicting cleanup horizons due to the phenomenon of tailing and rebound. (See note 2). The statute and rules do not require DEQ to balance estimated cleanup times in evaluating options, nor is it possible to do so where both options involve pump and treat. It is arbitrary to rely on guesses as to cleanup horizons as a basis for selecting an option in this context.
- PLS disputes DEQ's conclusion that the WCRRPG is not adequate under Part 201. (Decision Document, at 9). The contours of the Unit E contamination (as defined by the 85 ppb iso-concentration line) are fairly well established. No one has identified existing drinking water supply wells in this zone. There are also no industrial wells within this zone. The "deficiencies" identified by DEQ are, therefore, speculative and should not disqualify an otherwise useable institutional control.
- PLS disagrees with DEQ's analysis of the viability of the Northwest Supply Well. (Decision Document, at 9). The analysis arbitrarily ignores the fact that the City of Ann Arbor has publically stated it will not turn on that well, and that it has sued PLS for, among other things, the replacement value of the well. Use of the well would be inconsistent with the City's lawsuit. Moreover, there is nothing in the record or the Decision Document that suggests that the City needs the well for water supply or otherwise intends to use the well under any circumstances.
- DEQ's application of its "policy" (Decision Document, at 9) to deny a waiver request when a plume is in a wellhead protection area is arbitrary and capricious and not supported by the record. No such written policy has, in fact, been produced. There is no way for PLS to comment upon, or for the Court to determine if the rationale for that policy (if it indeed exists independent of this particular site) applies to the circumstances of the Northwest Supply Well.
- DEQ's determination that the WCRRPG does not meet the requirements for acceptable institutional controls is also arbitrary and not supported by the record. There are no rules or written guidance that elaborate on the elements of an institutional control. Section 18 of Part 201 provides only that an institutional control that is proposed as part of a remedy be adequate "to prevent unacceptable risk from exposure to the hazardous substances, as defined by the cleanup criteria approved as part of the remedial action plan." Section 20b of Part 201 provides: "mechanisms that may be considered under this subsection include, but are not

limited to, an ordinance that prohibits the use of groundwater or an aquifer in a manner and to a degree that protects against unacceptable exposures as defined by the cleanup criteria approved as part of the remedial action plan. An ordinance that serves as an exposure control pursuant to this subsection shall be published and maintained in the same manner as zoning ordinances and shall include a requirement that the local unit of government notify the department at least 30 days prior to adopting a modification to the ordinance, or to the lapsing or revocation of the ordinance.” It should be noted that neither statute prohibits exposure to *any* risk. The ordinance must be sufficient to prevent *unacceptable* exposure. With the exception of the Northwest Supply Well (discussed above) there are no water supply wells currently in the Unit E. While other Unit E wells exist, they are not near the plume and are located either cross-gradient or very far downgradient from the leading edge of the plume. There is, therefore, no basis in the record for concluding that the WCRRPG is insufficient merely because it does not require abandon of wells that actually do not exist within the plume boundaries or within any area that the plume could reasonably reach for many years.<sup>1</sup>

DEQ’s observation that the WCRRPG does not restrict operation of industrial wells (Record of Decision, at 9) is also misplaced. Current zoning does not allow industrial uses along the projected flow path, except in limited areas adjacent to the Huron River that is far downgradient of the leading edge. Also, the basis for this objection is stated to be that an industrial well “could change the configuration of the plume.” DEQ fails to explain why it matters if the configuration of the plume changes, provided the plume remains subject to the WCRRPG. Finally, while it is “possible” that zoning may change, that land uses may change in Ann Arbor, that a heretofore non-existent hypothetical industrial user might then move to Ann Arbor and want to install a well notwithstanding that its due diligence should show that the Unit E is contaminated, this is not a risk that is significant enough to be a basis for rejecting PLS’s plan. The statute only requires protection against unacceptable risk.

PLS rejects as inaccurate and misleading DEQ’s contention that there is no provision to monitor or protect existing private water supply wells east of the Huron River if the plume does underflow the Huron River. (Decision Document, at 9). The nearest such well is *three miles away*. PLS has already proposed a downgradient investigation that will answer DEQ’s concern many years before the plume could ever reach that well, even assuming it took a bee-line under the river. In addition, as DEQ elsewhere acknowledges but omits in its analysis, PLS has proposed a contingency plan to intercept contaminated groundwater *before* the water

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<sup>1</sup> The wells generally downgradient are in Ann Arbor Township. As part of its proposal, DEQ acknowledges that PLS has agreed to further demonstrate through investigation that these wells are not threatened by continued migration of a portion of the Unit E plume. In the interim, the WCRRPG is more than adequate to control actual exposures within the current plume boundaries and projected flowpath for the foreseeable future.

reaches receptors. There is, therefore, no basis in fact for DEQ's suggestion that PLS's plan would allow downgradient wells to become contaminated. One other observation – PLS is aware of one well, three miles away, that is on the other side of the river along the projected flow path. All other residential wells in that general direction are four miles away. While PLS, this Court, and DEQ all share in a goal to get started in addressing Unit E, there is no imminent threat to the public health or safety. The Decision Document is flawed to the extent it suggests that DEQ must reject PLS's proposal as inadequate to protect the public health and safety.

DEQ also rejects PLS's proposal on the basis that there is a substantial degree of long-term uncertainty associated with assumptions about groundwater flow and that there is currently not enough information to predict the exact route the plume will follow. (Decision Document, at 9). PLS disagrees with this assessment. PLS' projected the plume flow path using available geologic information and analysis. The projection was not a mere "assumption." Nothing in the record shows that DEQ has in any way attempted to quantify the "uncertainty" it references, and DEQ ignores the WCRRPG, the current flowpaths delineated in the DEQ-approved wellhead protection report, the available hydrogeologic information, and logic. PLS submitted information to support its proposed flow path, including model runs that show the dramatic decline in concentrations in the projected plume as PLS's mass removal strategy is implemented. While it is always possible to claim, as DEQ does here, that there is not enough information to determine "exactly" where the plume goes, there is nothing in the record that suggests it is necessary to know this to such a degree of certainty. To the contrary, the record evidence suggests that concentrations will be low enough to not present an unacceptable risk, even if the exact flowpath is not yet known. Moreover, DEQ's finding ignores three components of PLS's plan: (1) collection of additional information downgradient to verify the information PLS has submitted (which will provide more certainty, even if not "exact"); (2) the WCRRPG, which controls risk of exposure; and (3) PLS's contingency plan to intercept the plume near the river should (1) and (2) prove inadequate to control risks.

PLS acknowledges that a hydrogeologic study is necessary to add certainty to its plan. It has submitted a work plan to accomplish this to DEQ. PLS disputes that the current uncertainty is any more significant than the uncertainty in DEQ's alternative proposal. If and until an NPDES permit is issued, for example, neither PLS nor DEQ can know if it is feasible to discharge to the river or to treat extracted water at MVSC.

PLS disagrees with DEQ's position that it need not evaluate "as premature" the claim made by PLS that its proposal would be more compatible with existing land uses than the leading edge alternatives. (Decision Document, at 9). It is not premature to make this evaluation. PLS has submitted information to DEQ, as have other commentators, regarding these issues.

## **Public Involvement – Responsiveness Summary**

*Comment 28 (Responsiveness Summary at 7):* PLS strongly objects to and disputes statements made by DEQ to the public that suggests PLS is responsible to third parties in any respect. This statement is inappropriate in the context of the Decision Document and is not accurate as a matter of law.

*Comment 29 (Responsiveness Summary at 7):* PLS disputes that a pipeline to the Huron River is the only feasible method of discharge for treated groundwater from the Unit E.

*Comments 31 and 32 (Responsiveness Summary at 7):* PLS disputes the technical objections DEQ has interposed to reinjection as proposed by PLS.

### **DEQ's Preliminary (July 2004) Proposed Remedial Alternative and Evaluation**

This section of the Decision Document (Page 11 to 17) reiterates the position taken in July 2004. PLS has already submitted comments on that document which is part of the record here, and PLS incorporates by reference those comments.

In addition, PLS disputes that it is necessary to design a conveyance system to transport water downstream of the City's water intake in the Huron River. (Decision Document, at 13). PLS has operated a 1300 gpm groundwater treatment system at its facility for years without any incident that threatens the City's water supply. There are numerous controlled and uncontrolled industrial, agricultural and residential discharges to the Huron River upstream of the water supply intake that in comparison are far greater threats than the strictly controlled discharge from PLS. In fact, PLS has added significant volumes of clean water to the Huron River. There is no basis on the record for designating a location downstream of the intake as the only acceptable surface water discharge point into the Huron River.

### **DEQ's September 1, 2004 Selected Remedial Alternative for the Unit E Plume**

- PLS does not agree with the conclusion of DEQ that its proposed plan "is necessary to comply with Part 201 and the CJ." (Decision Document, at 13). This is not correct as a matter of law. The CJ does not require capture of the width of any of the identified plumes, except at the leading edge.
- PLS disputes that the balance of the criteria favor DEQ's alternative over PLS's selected remedial action. (Decision Document, at 13). A matrix comparing PLS's remedial action with DEQ's alternative is included as Attachment B. As shown on that matrix, none of the factors favor DEQ's alternative, and several factors favor PLS's remedial action.
- PLS also disputes the viability of verifying compliance with DEQ's approach. DEQ would require at each location the prevention of further migration at each location of concentration of 1,4-dioxane above 85 ppb in the downgradient or easterly direction. No method is suggested by DEQ, nor does PLS know of one, that can verify that this performance objective is being met, even if such a system were installed. That is because it is expected

that interior concentrations of the plume will continue to be at levels above 85 ppb for an undetermined time following initiation of DEQ's response. It does not appear feasible to directly verify whether the hydraulic barrier actually functions. Since PLS can be subject to penalties for failing to meet this directive, it is impermissible for the DEQ to establish an unattainable (or at least an unverifiable) performance objective. To the extent DEQ specifies some indirect measurement (such as purge rate) as the only way to document performance, DEQ's remedy in effect becomes only a more vigorous mass reduction strategy. DEQ cannot, and has not attempted to, justify their proposal on that basis.

PLS disputes DEQ's conclusion that a new 1300 gpm groundwater treatment facility can be located at or near the MVSC. (Decision Document at 14). PLS submitted significant information on the needs and risks of such a system in support of its contention that it is not feasible to build nor safe to operate at that location. DEQ, without any contrary information on specifications, research into existing property uses, or available property in the area, has dismissed PLS's information and simply stated it "believes" such a system to be feasible. This is patently insufficient. There is no support in the record for the DEQ's belief. Belief will not change zoning requirements; it will not create vacant land where there is none; it will not force owners of property to give up ownership for a cleanup; nor it will make a project feasible that is not. The very fact that DEQ suggests that alternative locations be explored illustrates that a suitable location may, in fact, not exist at all. Additionally, this decision is arbitrary. There is no legal distinction between the type of uncertainty associated with the groundwater plume direction and the uncertainty associated with whether the DEQ's treatment plant could be sited and constructed. On the contrary, PLS has made a record in support of its plan and explaining in detail the infeasibility of DEQ's treatment system. Yet DEQ has rejected the former as unacceptable (for the time being) because of lack of precision, while accepting the uncertainty of its own proposal on the basis of "belief."

PLS disputes DEQ's assertion that its plan would "significantly reduce" the amount of time needed to clean up the contaminated aquifer, and that this time difference (if it exists) reduces the threat to the public health, safety and welfare. (Decision Document, at 14, 15). There is no record on this. DEQ's position is once again based on belief instead of data. More importantly, there is no identified threat to the public health, safety and welfare presented by the Unit E that is time sensitive so there is absolutely no basis for the conclusion that a faster remedy is somehow a better one, even if DEQ's remedy could be

faster.<sup>2</sup>

- PLS disputes that DEQ need not consider balancing costs of PLS and DEQ's proposals because PLS's proposal is not protective. (Decision Document, at 14). The response actions are both protective and this balancing should occur.
- PLS disputes DEQ's conclusion that there is a need for a stochastic groundwater model. (Decision Document, at 15). This model is wholly unnecessary for DEQ's proposed remedy because the leading edge of the plume (not to mention two other locations) will have to be contained, leaving no need to do anything other than conventional performance monitoring outside of the plume and no need to do anything at all interior to the plume using a model.
- PLS disputes DEQ's assertion that its proposal reduces uncertainties associated with PLS proposal (Decision Document, at 14). As stated here and in earlier comments, the record shows that the uncertainties regarding risk are comparable for each remedy. The uncertainties regarding implementation are, however, far greater for DEQ's proposal.
- PLS disputes DEQ's conclusion that its remedy is "more readily implementable" than PLS's proposed remedy. (Decision Document, at 15). PLS and other commentators provided significant information to DEQ calling into question the implementability of its remedy. There is no substantive record response to these concerns. DEQ has, instead, dismissed them. Without limitation, DEQ has not responded substantively to the following facts regarding implementation of their remedy: (1) no available proximate property, suitable zoned and sized for DEQ's treatment system; (2) resistance expressed by the citizens of Ann Arbor, and even the City itself, to DEQ's plan to the extent it involves bringing contaminated groundwater to the surface in residential neighborhoods and disrupting those neighborhoods with infrastructure; (3) no NPDES permit has been issued for discharge to the Huron River; and (4) no transmission pipeline routes have been proposed by DEQ, making it impossible to

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<sup>2</sup> It has been well known in the professional community that pump and treat approaches in all but very simple situations typically cannot fully attain groundwater restoration (health based goals) throughout a plume no matter how long the system is operated. The main reason is the phenomenon of "tailing" and "rebound." This is described in guidance for pump and treat systems put out by USEPA for superfund sites. *Pump and Treat Groundwater Remediation, A Guide for Decisionmakers*, USEPA, July 6, 1996 (EPA/625/R-95/005), available at <http://www.epa.gov/ORD/NRMRL/pubs/625r95005/625r95005.pdf>. Tailing and rebound will, in situations such as this one, involving multilayered heterogenous geology, frustrate any cleanup of Unit E that is based on attaining criteria throughout the aquifer. There is no basis for DEQ's assertion that more pumping at the interior of the plume will attain criteria "faster."

know if a feasible route in fact exists at this time.

- PLS disputes DEQ's "recommendation" that it pursue use of the sanitary and/or storm sewer for disposal of treated groundwater from the Maple Road area. (Decision Document at 14). The record shows that the City cannot accept enough capacity to make this worthwhile, and has imposed conditions that make effective use of the sanitary impossible. The treatment system operational records at the Wagner Road facility show that it cannot be reliably switched on and off in response to weather conditions and still attain treatment limits. The calibration needed to assure that the right combination of energy, oxidants, contaminants, and balancing chemicals are maintained to meet cleanup limits is upset when the system is brought up and down.
- PLS disputes that it has not already met with its proposal, conditions 2, 3, 4, and 6 as outlined by DEQ in its Decision Document at 15-16. PLS also maintains, for the reasons discussed above, that condition 1 (Northwest Supply well elimination) is moot, unnecessary, and hence arbitrary.
- PLS disputes all of the elements of DEQ's proposal. (Decision Document, at 16).

#### **Appendix B, Attachment A: Response to Summary Comments (Weston)**

- PLS disputes Weston's response to PLS's comments regarding construction of pipelines. Based on the record and this response, Weston acknowledges that the full extent of the difficulties that will be encountered during the construction of the pipelines along the final pathway can only be determined as the design of the proposed alternative is refined. It is arbitrary and capricious, then, to make a judgment that the difficulties would be acceptable or surmountable without a final design. DEQ's solution, which is also arbitrary, is to make this PLS' problem. This is a further example of how DEQ is prepared to make judgements on inadequate information (or none at all) in support of its proposal, but requires PLS to make additional demonstrations as a condition to approval PLS's response action. So, for example, if there is not enough information to make decisions on the feasibility of reinjection (despite information provided in support to DEQ), then there is also not enough information to determine the feasibility of lengthy pipelines until a design is put forward.
- PLS disputes Weston's conclusions about the feasibility of treating 1300 gpm at Maple Village. In order to answer PLS's comments, Weston went back to a system vendor and asked for additional information. This information does not support DEQ's or Weston's conclusion as to feasibility, however. The record shows that the vendor acknowledged that it did not have data related to iron content or other characteristics of area groundwater, making their conclusions regarding the necessity of detention ponds unreliable. The record shows that the vendor acknowledged that "there are potentially significant health and safety issues associated with the handling and storage of liquid oxygen." The record shows that the neither DEQ nor the vendor can say reliably that treatment ponds would not be necessary

because the NPDES limits are not known. In particular, background concentrations of iron, bromide and arsenic may all create significant problems for the vendor's system.

PLS also disputes Weston's conclusion that ponds will not be needed to assist the treatment system. First, it is not disputed that PLS's existing UV-H2O2 system does use and need such ponds. DEQ stated in its decision document that PLS might have to use this system at MVSC if the proposed hydrogen-peroxide and ozone system will not meet (as yet undetermined) NPDES permit requirements. (Decision Document, at 14). While PLS is confident that it will be able to switch technologies DEQ apparently does not share that view and so cannot, as a basis of its decision, assume that UV-H2O2 will not be used. Second, until NPDES permit limits are known and a large scale H2O2/ozone system can be field tested using the Unit E water chemistry it cannot be said that ponds will not be necessary. There may be other engineering solutions to water quality problems, but these may involve additional cost, additional space, and may have other unintended or unforeseen consequences that preclude reliably selecting a treatment location that does not have room for ponds. This is particularly true where past experience has shown that these ponds are very useful in managing treatment efficiency and compliance with permit limits at the PLS plant.



Attachment 2: Decision Matrix

Rule 603 Criteria for Evaluation of Remedial Alternatives	Comments	Favors PLS Plan	Favors DEQ Alternative
The effectiveness of protecting the public health, safety, and welfare and the environment	Both remedies are equally protective.	--	--
Long-term uncertainties associated with proposed remedial action	For PLS plan, uncertainty is with projected pathway and fate of plume; for DEQ uncertainty is NPDES permit conditions and feasibility of treatment at MVSC and of construction of pipelines	--	--
The toxicity, mobility, and propensity to bio-accumulate of the hazardous substance	Not evaluated. Same for both.	--	--
The short and long-term potential for adverse health effects from human exposure	There are no current exposures. Both plans prevent future exposures	--	--
The costs of the remedial action, including long-term maintenance	DEQ did not balance the costs, although it did review the estimates. PLS estimates its plan will be much less costly.	Yes	No
The reliability of alternatives	Both rely on “pump and treat.”	--	--
The potential threat to public health, safety and welfare and the environment associated with the excavation, transportation, and re-disposal or containment	PLS’s plan is low (reinjection into aquifer). DEQ’s alternative considerably higher (large scale treatment, oxygen storage, materials transportation, construction and operation of pipelines)	Yes	No
The ability to monitor remedial performance	Both require extensive monitoring	--	--
The reliability of the alternatives	Large scale system proposed by DEQ is more prone to long term operation and maintenance problems; no way to directly verify internal “capture” requirement. PLS has proposed reinjection, which is well established technology.	Yes	No
The public’s perspective about the extent to which the proposed remedial action effectively addresses Part 201 and the Part 201 Rules.	Public comments went both ways. However, residents at the leading edge and the City of Ann Arbor do not favor “leading edge” capture	--	--
The potential for future remediation if the alternative fails	Same for both.	--	--

# *EXHIBIT E*

**STATE OF MICHIGAN**  
**IN THE CIRCUIT COURT FOR THE COUNTY OF WASHTENAW**

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JENNIFER GRANHOLM, Attorney  
General for the State of Michigan, ex rel,  
MICHIGAN NATURAL RESOURCES  
COMMISSION, MICHIGAN WATER  
RESOURCES COMMISSION, and  
MICHIGAN DEPARTMENT OF NATURAL  
RESOURCES,

Plaintiff,

Case No. 88-34734-CE

vs

Honorable Donald E. Shelton

GELMAN SCIENCES, INC.,

Defendant.

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**OPINION AND ORDER REGARDING REMEDIATION OF THE CONTAMINATION OF  
THE “UNIT E” AQUIFER**

At a Session of the Court held in the  
Washtenaw County Courthouse in  
the City of Ann Arbor, on December 17, 2004

**PRESENT: HONORABLE DONALD E. SHELTON, Circuit Judge**

Background

Gelman Sciences makes filters for medical purposes and employs several hundred people at a facility located on Wagner Road in Scio Township, adjacent to the City of Ann Arbor. For several years in its production of these filters Gelman used a man-made compound known as 1,4 dioxane, a solvent used in a number of products and industries. It is classified by the Environmental Protection Agency as a “possible” human carcinogen. Gelman had been storing waste water containing dioxane in unlined lagoons near its plant and had apparently also sprayed the wastewater on the ground around the plant. In the mid 1980’s, it was discovered that this waste water had seeped

through the ground and contaminated the ground water supply in the area. Gelman ceased using dioxane in 1986.

This case was originally filed in 1988 by the State to require Gelman to clean up pollution of local water supplies caused by the discharge of dioxane. The original judge conducted a trial in 1991 and found that the contamination was the result of waste disposal practices by Gelman but that those practices had been done in accordance with State approved procedures. Eventually, a Consent Judgment identifying the required remediation actions was agreed to by the parties and entered on October 26, 1992. In the 16 years this case has been pending, many things have changed, including the identity of the participants. The successor to the plaintiff agency is now called the Michigan Department of Environmental Quality (“MDEQ”). The defendant corporation was acquired by another company in 1997 and is now known as Pall Life Sciences, Inc. (“Pall”). The original judge retired, the case was reassigned, and then was subsequently reassigned to this Court.

The original Consent Judgment was amended by the parties and the Court on September 23, 1996 and again on October 20, 1999. In early 2000, the MDEQ filed a motion to enforce the Consent Judgment and for monetary sanctions. This Court conducted a lengthy evidentiary hearing. On July 17, 2000 the Court entered its Remediation Enforcement Order which ordered the development and implementation of a detailed plan to reduce the dioxane in all affected water supplies below legally acceptable levels within a period of five years. The Court ordered plan also provided for subsequent monitoring of water supplies for an additional ten year period. The parties

were advised that the Court intended to vigorously enforce the Consent Judgment and its remedial orders with all of its statutory and equitable powers.

The parties have complied with the basic provisions of Court's Remediation Enforcement Order. By pumping and treating over a billion gallons of contaminated water at a treatment facility constructed on its Wagner Road site, over 37,000 pounds of 1,4 dioxane has been removed from the aquifer covered by this Court's five year order. Pall has complied with the terms of that Order.

However, in 2001 it was discovered that the contaminant had somehow seeped below the shallower aquifer and had contaminated a much deeper aquifer denominated by the parties as "Unit E". Test wells revealed that the plume of dioxane in that aquifer had spread Eastward under the City of Ann Arbor. The parties have been testing throughout the area to determine the spread of the plume and have been trying to develop a plan to treat the contamination of that aquifer. While there is apparent agreement on several aspects of the proposed remedial action, MDEQ and Pall disagree about important parts of the plan. The Court ordered the parties to submit their view of the proposals and to respond to questions posed at the last hearing so that the Court could resolve the outstanding issues and expedite the decontamination process for Unit E.

#### Procedural Posture

Initially, the parties have raised questions about the applicability of the Consent Judgment to Unit E, the responsibility of the Court to review MDEQ actions, and the scope of the Court's role in this process.

The Court finds that the Unit E contamination is subject to the Consent Judgment in this case. While this particular area of contamination had not been discovered at the time of the Consent Judgment, that judgment was intended to address the entire issue of the remediation of 1,4 dioxane emanating from the Gelman property on Wagner Road. Technically, the Court agrees with the MDEQ assertion that Unit E falls within the “Western System” as that phrase was used in the Consent Judgment. Its subsequent migration in an easterly direction does not negate that finding. The Court has the inherent and equitable powers to enforce its judgment with all appropriate measures and sanctions as to Unit E contamination.

The MDEQ, however, also questions the scope of the Court’s powers and responsibilities regarding enforcement of the Consent Judgment and the Court’s statutory powers and responsibilities pursuant to Part 201 of the NREPA, MCL 324.20101 *et seq.* As MDEQ asserts, the Court’s determination of appropriate remedial action under both the Consent Judgment and the statute should normally be based on the administrative record, including all materials submitted by the defendant. *Consent Judgment*, Sec. XVI.C; MCL 324.20137(5). The Consent Judgment also provides for the taking of additional evidence “by the Court on its own motion or at the request of either party if the Court finds that the record is incomplete or inadequate”. *Consent Judgment*, Sec. XVI.C.

The Court’s review of MDEQ actions is not solely limited to a determination of whether those actions are “arbitrary and capricious”. The standard for review under the statute is whether the “decision was arbitrary and capricious or ‘otherwise not in accordance with law’”. MCL 324.20137(5). The standard for review of MDEQ remedial

action proposals under the Consent Judgment in this case is broader as well. It provides that MDEQ actions are reviewed by this Court to determine if the decision is either (1) inconsistent with the Consent Judgment, or (2) not supported by competent, material, and substantial evidence on the whole record, or (3) arbitrary, capricious, or clearly an abuse or unwarranted exercise of discretion, or (4) affected by any other substantial and material error of law. *Consent Judgment*, Section XVI.D.

Additionally, the Court has and intends to exercise its inherent powers to enforce its own directives. Circuit courts have the jurisdiction and the power to make any order to fully effectuate the circuit courts' jurisdiction and judgments. See *St. Clair Commercial & Savings Bank v. Macauley*, 66 Mich App 210 (1975); *Schaeffer v. Schaeffer*, 106 Mich App 452 (1981); *Cohen v. Cohen*, 125 Mich App 206 (1983); MCL 600.611. This case ended up in Court initially because no clean up of significant pollution had even begun without Court intervention. The MDEQ, and subsequently the defendant, sought to invoke the equitable and statutory powers of the Court to bring about remediation of a dangerous contamination of the public's water supply. Eventually a judgment was entered and remediation orders have been made by the Court to effectuate that judgment and the goal of cleaning up this pollution. Despite the best efforts of the parties, it is not done. The extent of the contamination is deeper and greater than originally known, perhaps aggravated many years ago both by the initial resistance of Gelman and the initial ineffectiveness of the State agency. It is going to take continued concerted actions by all of the parties to remedy this expanding contamination. The Court is determined to exercise all of its inherent, statutory, and equitable powers to assure that those actions take place as soon as possible.

### The Unit E Disputes

The Unit E aquifer is extremely deep, apparently over 200 feet underground. It appears to flow in an easterly direction eventually depositing water into the Huron River, which runs through Washtenaw County and the City of Ann Arbor. Test wells have indicated the presence of 1,4 dioxane under the City with the leading edge of the plume more than two miles from the Wagner Road facility. The plume is continuing to spread. At this point, the aquifer is not a source of drinking water. The City of Ann Arbor services all of its citizens with a municipal water system which draws its water primarily from the Huron River but at a point well upstream of the point at which the Unit E aquifer vents into the river. One City well did draw water from the aquifer but it has been taken out of service. There are no private wells drawing from the affected portion of the aquifer.

The MDEQ and Pall have diligently been pursuing a plan to control the contamination plume in the Unit E aquifer. Test wells have been put in place. Working in conjunction with the MDEQ, Pall has designed new technologies to arrest the contamination. The parties have cooperated in the exchange of technical data and other information. There is significant public interest and several public hearings have been held. Input has been received from public interest organizations as well as from the City of Ann Arbor. MDEQ made a decision on September 1, 2004 outlining its plan for Unit E remediation. The parties agree on much of that plan but disagree on two important elements: (1) the actions to be taken at the Wagner Road facility to prevent further contamination of the aquifer, and (2) the approach to be used to remove contaminants



from the plume in the aquifer that is already migrating East of the Wagner Road facility. The disputes as to those issues are properly before the Court.

Actions to be Taken at the Wagner Road Facility

The MDEQ calls for Pall to do test borings and then install extraction wells into the Unit E aquifer at the Wagner Road site and to purge the water from those wells at the treatment facility Pall has built and operates on that property. The purged water would then be discharged into Honey Creek in the same manner as Pall has successfully treated and discharged water from shallower sources. Pall agrees with the test borings, including one with the “rotasonic” technique required by MDEQ.

Pall disputes the MDEQ requirement that extraction wells and treatment then be undertaken with a goal to “capture the entire width of the Unit E plume at Wagner Road” and to “create a hydraulic barrier near Wagner Road to prevent further migration of groundwater contamination above 85 ppb east of Wagner Road”. Pall proposes that any extraction wells would be designed to reduce the mass of contaminants but claims that the objective of capturing the entire width of the plume at that point is not feasible, not supported by the evidence, and would be inconsistent with its obligations under the Consent Judgment.

It appears to the Court that much of this dispute is semantic, or at least premature. The goal set by the MDEQ of total capture of the width of the plume is certainly appropriate - if it can be done. Whether it is feasible or not depends on a number of factors that will not be known until the test borings are complete. That portion of the MDEQ rationale relating to protecting non-existent private wells and protecting the non-operational City Northwest Supply well is not supported by the evidence on the

record. However, the primary MDEQ rationale is that controlling groundwater contamination at or near its source is more efficient than trying to capture it later as it spreads through the aquifer. There is ample support for that position. Pall does not seriously contest that proposition but disagrees with MDEQ's projection of the degree to which such interception will prove successful. Pall may well be right but the reality is that we will simply not know how much reduction is possible until the test wells are complete and extraction wells placed into operation.

One portion of the Pall objection to the Wagner Road plan deserves more serious consideration. Pall maintains that if it extracts and treats all of the Unit E water that MDEQ wants at Wagner Road, it will not be able to discharge that water into Honey Creek because, when combined with the other required treatment already underway, the total will exceed the NPDES discharge permit levels allowed by MDEQ. To the extent that this proves to be true, the MDEQ will either have to expeditiously increase the discharge permit level or forego its goal of complete Unit E capture at Wagner Road. To the extent that there is a "competition" for permitted discharge, priority must be given to the water currently being treated from shallower levels.

Subject to the limitations expressed above, Pall shall:

1. Perform the investigation described in the August 1, 2004 Work Plan for Test Boring/Well installation and Aquifer Testing in the Wagner Road Area, as modified by MDEQ's letter of August 19, 2004, including the use of rotasonic drilling for at least one boring.
2. Submit a report of the investigation to MDEQ within 30 days of the completion of the aquifer performance test.

3. Within 60 days after completion of the aquifer performance test, submit a work plan to MDEQ which will, to the maximum extent feasible, prevent further migration of groundwater contamination above 85 ppb of 1,4 dioxane eastward into the Unit E aquifer. The plan will identify any required increase in the NPDES discharge permit to accommodate such additional treatment.
4. If the parties do not agree on a Unit E Wagner Road work plan within 30 days after submission, it will be brought before the Court on motion by MDEQ for resolution.

#### Actions to be Taken in the Eastern Portion of Unit E

The other major issue is how to remove contaminants from the plume that has already spread eastward into the Unit E aquifer. It will never be possible to extract all of the 1,4 dioxane from this deep aquifer and the geology is such that it will ultimately end up in the Huron River and be diluted far below currently acceptable standards. But the goal must be to remove as much of the contaminant as possible, as quickly as possible, so that the ultimate dilution will take place with minimal impact on the water resource.

Pall has proposed remediation by means of a reinjection system in which water is extracted from the aquifer, treated on the Maple Road site, and immediately reinjected into the aquifer at that location. This system is one which has been developed over the last many months and has been the subject of much investigation by the parties as well as review hearings by the Court. The MDEQ has, with the conditions and qualifications discussed below, agreed with the Pall reinjection plan. The Court believes that treatment and reinjection of Unit E water

should commence forthwith in accordance with that plan. Pall shall submit its detailed work plan to MDEQ not later than thirty days from this Order. The work plan will be designed to purge enough water so that any water escaping from the purging zone in Unit E will not exceed 2,800 ppb recommended by the MDEQ.

The MDEQ qualified its approval of the Pall plan on six conditions, some of which form the basis of the disputes now before the Court. The first MDEQ condition is that the City of Ann Arbor formally abandon the Northwest Water Supply (“Montgomery”) well. The City closed the well in February of 2001. The cause for the closing is being disputed between the City and Pall in a separate lawsuit. The City there claims that it closed the well because dioxane from the Gelman site had contaminated it. Pall claims that the level of 1,4 dioxane alleged to be in the well was 2 ppb, well below the 85 ppb standard. Pall also claims that the well is closed because the City found 18 ppb of arsenic, unrelated to any Gelman contamination, in the well. The outcome of those allegations, and any compensation claims, will be decided in that separate action. As far as this case is concerned, the closed well has no bearing on the remediation plan for Unit E. There is no basis to include it as a condition to the clean up plan.

The third condition imposed by MDEQ relates to the administrative requirements of the statute. Since the proposed remedial plan contemplates levels above 85 ppb, provisions of the rules require an administrative “waiver”. Pursuant to MCL 324.20118(6)(d), such a waiver would require “other institutional controls necessary to prevent unacceptable risk from exposure to the hazardous substances”. MCL 324.20120b(5) states the mechanisms for such institutional

controls “include, but are not limited to, an ordinance that prohibits the use of groundwater or an aquifer in a manner and to a degree that protects against unacceptable exposures as defined by the cleanup criteria approved as part of the remedial plan”. Applied to this case, this means that there must be enforceable restrictions on the human use of water from the Unit E aquifer during remediation. Pall asserts that the Washtenaw County Rules and Regulations for the Protection of Groundwater adopted on February 4, 2004, if supplemented by an appropriate order from this Court, meet that statutory requirement. The Court agrees. Under the circumstances of this case it would be arbitrary and unreasonable to delay the cleanup of the Unit E aquifer pending the drafting and potential adoption of an ordinance or other legislative action to supplement the Washtenaw County Rules and Regulations already in place. The parties are directed to submit a proposed order to this Court which will include at least the following controls:

1. A map that identifies the area that would be covered by the judicial institutional control, including a buffer zone.
2. A prohibition against the installation of new water supply wells for drinking, irrigation, or commercial or industrial use, within the zones shown on the map.
3. A prohibition directed to the County Health Officer prohibiting permits for well construction in those zones.
4. A prohibition against consumption or use of groundwater from within the zones.
5. A requirement that PLS provide, at its expense, connection to the City of Ann Arbor municipal water supply for any existing private drinking water wells within the zones.
6. A requirement that the Order be published and maintained in the same manner as a zoning ordinance.

7. A provision that the Order shall remain in effect until such time as it is amended or rescinded by further Order of the Court, with a minimum 30 days notice to all parties.

8. A provision to allow either party to move to amend the boundaries of the prohibition zone to reflect material changes in the boundaries or fate of the plume as determined by future hydrogeological investigations and/or monitoring.

Next, the MDEQ conditions its approval of the remediation plan on the retention by Pall of a person to do “stochastic modeling” of Unit E. Based on the record, there is no substantial evidence to indicate that such a model would assist the remediation of this area in any way. The field data required by the MDEQ has served to develop the model for remediation and will continue to do so. It is this field data that allows the MDEQ, and then the Court, to review whether the remediation is working. There is no indication that “stochastic modeling” will add anything to those remediation efforts and it is not required. MDEQ has properly required that Pall conduct future monitoring of the plume path and plume concentration. Pall has agreed and has submitted a work plan to meet that requirement.

Finally, and most importantly, the MDEQ has conditioned its approval of the remediation plan on the development of an alternative plan that would require construction of a large treatment facility at Maple Road and the piping of water from significant distances through Unit E back to Maple Road for treatment and then discharge into the Huron River via another pipeline. The alternative insisted upon by MDEQ would require the installation and operation of a treatment system large enough to accommodate 1150 gallons per minute in the commercial area near Maple Road. Pall contends that such a facility is not feasible and would not be safe. The feasibility of the MDEQ proposal is subject to serious question. The acquisition and rezoning of enough

land to site both the treatment facility and the required ponds in this congested area would take considerable time, if it ever could be done. Such a facility would require location and storage of an amount of liquid oxygen equal to that currently used at the Wagner Road treatment facility and five times the amount used at the current Maple Road mobile facility. Locating such a facility in this retail commercial area does pose significant dangers.

Most importantly, the alternative in this MDEQ condition means that thousands, perhaps millions, of gallons of contaminated water would need to be piped under the City to be treated at the proposed Maple Road facility. This would require the installation of three to four miles of pipelines, including at least 1½ miles of pipelines in residential Ann Arbor neighborhoods. To say that the residents in the affected areas would be reluctant to agree to have pipelines containing 1,4 dioxane running through their neighborhoods is an understatement by several degrees of magnitude. Public hearings have demonstrated overwhelming opposition to such a plan. While the City of Ann Arbor has filed a pleading agreeing with the construction a Maple Road facility, notably missing from its brief is any commitment to facilitate the location of the required dioxane-bearing pipelines in Ann Arbor neighborhoods. In 1998 it took months, and this Court eventually had to intervene with an Order, to force the installation of 1000 feet of a pipeline near the Wagner Road facility--and that pipeline was only running under a freeway.

Whether the concerns of residents about such pipelines are scientifically justified or not, the political and practical reality is that the required pipeline rights-of-way and construction could not begin to take place for years, if ever. This contamination was

discovered twenty years ago and this lawsuit to get it cleaned up has been pending for sixteen of those years. The water in the Unit E aquifer continues to flow and the plume of 1,4 dioxane continues to expand within it. We simply do not have the years it would take for the MDEQ alternative to begin to remove any contamination from the leading edge of the Unit E. plume. After careful examination of the MDEQ alternative set forth in its conditions, the Court finds that it is not feasible, is unwarranted, and is not supported by competent, material, and substantial evidence.

### Conclusion

The parties have worked diligently to address the question of how the contamination of the Unit E aquifer should be addressed and have investigated several alternatives. The process has been exhaustive but not expeditious. In the meantime the plume of 1,4 dioxane continues to spread. It is not the role of this Court to devise or fashion remedies for the spreading pollution of this deep aquifer. It is the role of this Court to enforce the Consent Judgment and to assure that whatever remedy is implemented conforms to that Judgment and to the pollution statutes of the State. The overriding guideline for that enforcement is the health and welfare of the public. The health and welfare of the public demands that the cleanup of the contamination of this large body of underground water begin, and proceed, as soon as humanly possible. The parties are ordered to implement the holdings in this Opinion and Order forthwith.

IT IS SO ORDERED

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Donald E. Shelton  
Circuit Judge



# *EXHIBIT F*

STATE OF MICHIGAN

IN THE CIRCUIT COURT FOR THE COUNTY OF WASHTENAW

JENNIFER M. GRANHOLM, Attorney  
General for the State of Michigan, *ex rel*,  
MICHIGAN DEPARTMENT OF  
ENVIRONMENTAL QUALITY,

Plaintiffs,

File No. 88-34734-CE

v

Honorable Donald E. Shelton

GELMAN SCIENCES, INC.,  
a Michigan corporation,

Defendant.

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**ORDER PROHIBITING GROUNDWATER USE**

At a session of said Court held in the City of Ann Arbor, County of  
Washtenaw, Michigan, on the 17<sup>th</sup> day of May,  
2005.

PRESENT: HONORABLE DONALD E. SHELTON  
Circuit Court Judge

On December 17, 2004, this Court issued its Opinion and Order Regarding Remediation of the Contamination of the "Unit E" Aquifer. That Opinion and Order resolved a dispute between the Parties regarding the September 1, 2004 Decision Document issued by the Michigan Department of Environmental Quality (MDEQ) regarding remediation of the "Unit E" groundwater contamination emanating from the Pall Life Sciences (PLS) (formerly known as Gelman Sciences, Inc.) facility in Scio Township, Washtenaw County.

Among other things, this Court determined that in order to satisfy the requirements of MCL 324.20118(6)(d) and MCL 324.20120b(5) for institutional controls preventing

unacceptable exposure to 1,4-dioxane in the groundwater, it is necessary and appropriate to supplement the Washtenaw County Rules and Regulations for the Protection of Groundwater adopted February 4, 2004, with a legally enforceable order of this Court prohibiting certain groundwater uses in specifically defined areas and addressing the relevant conditions identified in the MDEQ's September 1, 2004 Decision Document.

ACCORDINGLY, pursuant to the December 17, 2004 Opinion and Order, based upon further information provided by the Parties, for the reasons stated by the Court in its May 4, 2005 ruling on Plaintiffs' Motion to Enter Order Prohibiting Groundwater Use, and in the exercise of this Court's statutory and inherent authority to enforce its orders and judgments,

IT IS HEREBY ORDERED:

1. The prohibitions imposed by this Order apply to the zone identified in the map attached hereto as Figure 1 (Prohibition Zone).
2. The installation by any person of a new water supply well in the Prohibition Zone for drinking, irrigation, commercial, or industrial use is prohibited.
3. The Washtenaw County Health Officer or any other entity authorized to issue well construction permits shall not issue a well construction permit for any well in the Prohibition Zone.
4. The consumption or use by any person of groundwater from the Prohibition Zone is prohibited.
5. The prohibitions listed in paragraphs 2, 3, and 4 do not apply to the installation and use of:

(a) groundwater extraction and monitoring wells as part of response activities approved by MDEQ or otherwise authorized under Parts 201 or 213 of NREPA, or other legal authority.

(b) dewatering wells for lawful construction or maintenance activities, provided that appropriate measures are taken to prevent unacceptable human or environmental exposures to hazardous substances and comply with MCL 324.20107a.

(c) wells supplying heat pump systems that either operate in a closed loop system, or if not, are demonstrated to operate in a manner sufficient to prevent unacceptable human or environmental exposures to hazardous substances and comply with MCL 324.20107a.

(d) emergency measures necessary to protect public health, safety, welfare or the environment.

(e) any existing water supply well that has been demonstrated, on a case-by-case basis and with the written approval of the MDEQ, to draw water from a formation that is not likely to become contaminated with 1,4-dioxane emanating from the PLS facility. Such wells shall be monitored for 1,4-dioxane by PLS at a frequency determined by the MDEQ.

6. PLS shall provide, at its expense, connection to the City of Ann Arbor municipal water supply to replace any existing private drinking water wells within the Prohibition Zone. Within thirty (30) days after entry of this Order, PLS shall submit to MDEQ for review and approval a work plan for identifying, or verifying the absence of, any private wells within the Prohibition Zone, for the abandonment of any such private wells and for replacement of private drinking water wells with connection to the municipal water supply. Well abandonment and replacement shall be performed in accordance with all applicable regulations and procedures at the expense of PLS. PLS shall implement the work plan and schedule approved by MDEQ.

7. This Order shall be published and maintained in the same manner as a zoning ordinance.
8. This Order shall remain in effect in this form until such time as it is amended or rescinded by further order of this Court, with a minimum of thirty (30) days prior notice to all Parties.
9. Either Party may move to amend the boundaries of the Prohibition Zone to reflect material changes in the boundaries or fate of the groundwater contamination plume as described by future hydrogeological investigation or MDEQ approved monitoring of the fate of the groundwater contamination.
10. In the event the boundary of the Prohibition Zone is expanded, PLS shall, within thirty (30) days after entry of such an Order, submit to the MDEQ for review and approval, a work plan for identifying, or verifying the absence of any private wells within the modified Prohibition Zone, for the abandonment of any such private wells, and for the connection to the municipal water supply to replace any drinking water wells within the modified Prohibition Zone.
11. Either Party or a local unit of government having jurisdiction within the Prohibition Zone may seek enforcement of this Order by the Court.
12. This Order shall not affect the rights, liabilities, or defenses of any party in any other legal or administrative proceeding, nor shall it constitute evidence of either the presence or absence of 1,4-dioxane at any location inside or outside the Prohibition Zone in any such proceeding.

**/s/DONALD E. SHELTON**

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HONORABLE DONALD E. SHELTON  
Circuit Court Judge

APPROVED AS TO FORM:

*Robert P. Reichel*

Robert P. Reichel (P31878)  
Assistant Attorney General  
Attorney for Plaintiffs

Gelman/1989001467/Order3

*Michael L. Caldwell by PPR*

Michael L. Caldwell (P40554)  
Alan D. Wasserman (P39509)  
Attorneys for Defendant

*with  
consent*

# *EXHIBIT G*

STATE OF MICHIGAN

IN THE CIRCUIT COURT FOR THE COUNTY OF WASHTENAW

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ATTORNEY GENERAL for the  
STATE OF MICHIGAN, et al,  
MICHIGAN NATURAL RESOURCES  
COMMISSION, MICHIGAN WATER  
RESOURCES COMMISSION, and  
MICHIGAN DEPARTMENT OF  
NATURAL RESOURCES,

Plaintiffs,

vs

GELMAN SCIENCES INC. a Michigan  
Corporation,

Defendant.

---

Case No. 88-34734 CE

Honorable Donald E. Shelton

**ORDER REGARDING POTENTIAL REMEDIAL MODIFICATIONS**

At a Session of the Court held in the  
Washtenaw County Courthouse in  
the City of Ann Arbor, on April 6, 2009

**PRESENT: HONORABLE DONALD E. SHELTON, Circuit Judge**

The parties have been involved with remediating the groundwater contamination associated with past operations at Defendant Gelman Sciences, Inc.'s Wagner Road, Ann Arbor, Michigan facility since the late 1980's. Gelman, which was purchased by Pall Corporation in 1997 and now does business as Pall Life Sciences ("PLS"), is responsible for implementing the requirements of the October 26, 1992 Consent Judgment, as amended, (the "Consent Judgment") and this Court's subsequent remediation orders, including the July 17, 2000 Remediation Enforcement Opinion and Order (the "REO") and the December 14,



2004 Order and Opinion Regarding Remediation Of The Contamination Of The "Unit E" Aquifer (the "Unit E Order").

The Consent Judgment, REO, and Unit E Order each reflected the parties' and the Court's understanding of the hydrogeology and extent of contamination at the time they were entered by the Court. The parties now recognize that the different remedial approaches embodied in those documents have resulted in inconsistent remedial objectives and approaches. These inconsistencies along with divergent interpretations of the legal requirements imposed on PLS have contributed to disagreements between the parties as to extent of PLS' obligations, resulting in some cases to a diverting of resources (technical and legal) away from the cleanup.

The parties have decided to explore possible modification of the cleanup program that incorporates a coherent remedial approach to the groundwater contamination and reflects changes in state environmental law over time, the parties' current knowledge of site conditions, and the previous rulings of the Court. Over the last number of months, the parties have been discussing potential modifications to the cleanup program. The goal of any modifications will be to continue to protect the public while increasing the effectiveness and efficiency of the cleanup. While the discussions have progressed, the parties are still working through various issues and no final decisions have been made regarding any modifications.

Briefly stated, the modifications under consideration are as follows:

1. Overall Structure. The parties have discussed modifications that should

simplify the legal structure of the cleanup program by reducing the number of remedial systems and cleanup objectives and eliminating the largely outdated aquifer designations (e.g., "Unit E" v. D2 or C3 aquifers). Under PLS' proposal, there will be only two remedial systems, which will be defined geographically by their location east or west of Wagner Road and by the presence/absence of an institutional control.

a. West of Wagner Road, the cleanup program would focus on removing the most highly contaminated groundwater contamination through groundwater extraction and treatment. Although extraction at Wagner Road would continue, it is expected that some groundwater contamination above the drinking water cleanup criterion would migrate into the Prohibition Zone established by the Court.

b. East of Wagner Road, the cleanup program focuses on the possible consolidation of the Evergreen Subdivision and Maple Road systems and their conflicting cleanup objectives (Evergreen – capture 85 ppb; Maple Road – capture 2,800 ppb) into one coordinated response action system.

2. Cleanup Objectives. The Cleanup Objectives for the modifications under consideration include the following:

a. Prevent Expansion. PLS would be responsible for taking the response actions needed to prevent the groundwater contamination above the drinking water criterion from expanding beyond its current boundaries in areas outside the Prohibition Zone previously established by the

Court.

- b. Maintain Integrity of Prohibition Zone Boundaries. PLS would continue to monitor the migration of the groundwater contamination as it migrates through the Prohibition Zone to ensure that it does not expand beyond the Prohibition Zone boundaries (including the proposed expanded area) or underflow the Huron River.
- c. Mass Removal. PLS would continue operate a number of existing purge wells and install at least one more extraction well to reduce the higher concentrations west of Wagner Road before the groundwater enters the Prohibition Zone and in the Evergreen Subdivision area. PLS would continue to operate each of these wells until concentrations in the groundwater extracted by the wells are reduced to agreed upon levels and all other relevant objectives continue to be met.
- d. Maple Road Capture. PLS would continue to prevent groundwater with concentrations exceeding 2,800 ppb (the groundwater/surface water interface criterion) from migrating east of Maple Road in order to insure that levels above the GSI criterion do not reach the Huron River.

The Court has not ruled upon any of these proposed modifications and is not amending its previous orders. However, the Court will allow for parties to pursue potential modifications if done in a timely manner. The schedule for considering and proposing such modifications will be as follows:

TASK

Begin Implementing Evergreen System-  
Reduced Extraction Rate Study Work  
Plan

Week of 1/19/09  
(Weather  
Permitting)

PLS Submit of the findings of  
Evergreen System Reduced Extraction  
Rate Study Work Plan (Evergreen  
Report)

3/13/2009 (or  
within 30 days  
of completion of  
work)

Parties to Meet to Discuss Impact, if  
any, of Evergreen Data on Proposed  
Modifications

Week of 3/23/09  
(or within 10  
days of DEQ's  
receipt of report)

PLS Submit Revised Remediation Plan

04/24/2009

DEQ File Motion Re: Well ID Disputes  
(if necessary)

04/30/2009

DEQ Response to PLS Remediation  
Proposal/

05/22/2009

Parties to File Motions RE: Disputes (if  
needed)

06/12/2009

Parties File Motion Seeking Court  
Approval of Remediation  
Plan/Resolution of Disputes (including  
necessary Consent Judgment  
amendments)

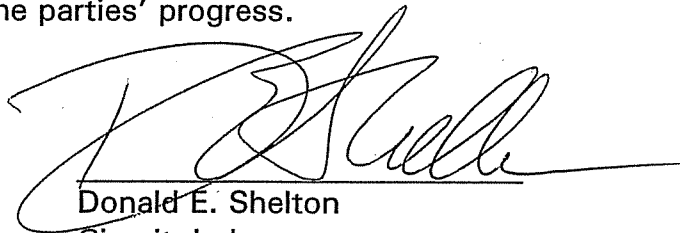
06/12/2009

PLS to Seek Court Order regarding access  
(if necessary)

90 days after  
Plan Approval

The parties may seek to modify this schedule as necessary, with approval of the Court. This Court may schedule additional status conferences or hearings as needed to keep the Court fully advised of the parties' progress.

IT IS SO ORDERED.

A handwritten signature in black ink, appearing to read 'D. Shelton', written over a horizontal line.

Donald E. Shelton  
Circuit Judge

# *EXHIBIT H*

STATE OF MICHIGAN  
IN THE CIRCUIT COURT FOR THE COUNTY OF WASHTENAW

Dep't of Attorney General  
**RECEIVED**

MAR 22 2011

ATTORNEY GENERAL FOR THE STATE OF  
MICHIGAN, ex rel, MICHIGAN DEPARTMENT  
OF NATURAL RESOURCES AND ENVIRONMENT,

Plaintiffs,

File No. 88-34734-CE

**NATURAL RESOURCES  
DIVISION**

v

Honorable Donald E. Shelton

GELMAN SCIENCES, INC.,  
a Michigan corporation,

Defendant.

---

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**THIRD AMENDMENT TO CONSENT JUDGMENT**

A Consent Judgment was entered in this case on October 26, 1992. The Consent Judgment requires Defendant, Gelman Sciences, Inc., to implement various response activities to address environmental contamination in the vicinity of Defendant's property in Scio Township, subject to the approval of the Michigan Department of Environmental Quality ("MDEQ").

The Consent Judgment was amended by stipulation of the parties and Order of the Court on September 23, 1996 ("Amendment to Consent Judgment") and October 20, 1999 ("Second Amendment to Consent Judgment").

The Court has also supplemented the Consent Judgment with several cleanup related orders, based on information about the nature and extent of contamination acquired after the Consent Judgment and the Amendments were entered, including, Remediation and Enforcement Order (REO) dated July 17, 2000, the Opinion and Order Regarding Remediation of the Contamination of the "Unit E" Aquifer ("Unit E Order"), dated December 17, 2004, and the Order Prohibiting Groundwater Use, dated May 17, 2005.

Since entry of the Second Amendment to Consent Judgment, Executive Order No. 2009-45 was signed and effective January 2010, the MDEQ was abolished as an agency of the State, the Michigan Department of Natural Resources (MDNRE) was created, and all of the authority, powers, duties, functions, responsibilities, and personnel relevant to this action were transferred to the MDNRE.

THEREFORE, the Parties agree to this Third Amendment to the Consent Judgment ("Third Amendment") and such Third Amendment is ordered, adjudged, and decreed as follows:

FIRST, modify Sections III.F G, H, J, and N to read as follows:

F. "GSI Property" shall mean the real property described in Attachment A, currently owned and operated by Defendant in Scio Township, Michigan.

G. "Groundwater Contamination" or "Groundwater Contaminant" shall mean 1,4-dioxane in groundwater at a concentration in excess of 85 micrograms per liter ("ug/l") (subject to approval by the Court of the application of a new criteria) determined by the sampling and



analytical method(s) described in Attachment B to this Consent Judgment, subject to review and approval by MDNRE.

H. "MDNRE" shall mean the Michigan Department of Natural Resources and Environment, the successor to the Michigan Department of Environmental Quality ("MDEQ"), the Michigan Department of Natural Resources ("MDNR"), and to the Water Resources Commission. All references to the "MDEQ," "MDNR," or to the "Water Resources Commission" in this Consent Judgment, as amended, shall be deemed to refer to the MDNRE or any successor agency.

J. "Plaintiffs" shall mean the Attorney General of the State of Michigan, ex rel, Michigan Department of Natural Resources and Environment.

N. "Soil Contamination" or "Soil Contaminant" shall mean 1,4-dioxane in soil at a concentration in excess of 1700 ug/kg as determined by the sampling and analytical method(s) described in Attachment C, or other higher concentration limit derived by means consistent with Mich Admin Code R 299.5718 or MCL 324.20120a.

SECOND, delete Section III.P and insert new Sections III.P., Q., R., S., T, and U.:

P. "Prohibition Zone Order" shall mean the Court's Order Prohibiting Groundwater Use, dated May 17, 2005, which established a judicial institutional control.

Q. "Prohibition Zone" shall mean the area that is subject to the institutional control established by the Prohibition Zone Order.

R. "Expanded Prohibition Zone" shall mean the area that shall be subject to the institutional control established by the Prohibition Zone Order pursuant to this Third Amendment to the Consent Judgment. A map depicting the Prohibition Zone and the Expanded Prohibition Zone is attached as Attachment E.

S. "Unit E Order" shall mean the Court's Opinion and Order Regarding Remediation of the Contamination of the Unit E Aquifer dated December 17, 2004.

T. "Eastern Area" shall mean the part of the Site that is located east of Wagner Road and the areas encompassed by the Prohibition Zone and Expanded Prohibition Zone.

U. "Western Area" shall mean that part of the Site located west of Wagner Road, excepting the Little Lake Area System described in Section V.C.

THIRD, modify the first paragraph of Section V to read as follows:

Defendant shall design, install, operate, and maintain the systems described below. The objectives of these systems shall be to extract the contaminated groundwater from the aquifers at designated locations for treatment (as required) and proper disposal to the extent necessary to prevent the plumes of groundwater contamination emanating from the GSI Property from expanding beyond the current boundaries of such plumes, except into and within the Prohibition Zone and Expanded Prohibition Zone (subject to paragraph 9 of the Prohibition Zone Order, as modified by Section V.A.2.b., of this Consent Judgment with regard to the northern boundaries of the Prohibition Zone and Expanded Prohibition Zone), as described below. Defendant also shall implement a monitoring program to verify the effectiveness of these systems.

FOURTH, modify Section V.A. to read as follows:

A. Eastern Area System

1. Objectives. The remedial objectives of the Eastern Area System ("Eastern Area Objectives") shall be:

a. Maple Road Containment Objective. The current Unit E objective set forth in the Unit E Order of preventing contaminant concentrations above the groundwater-surface water interface criterion of 2,800 ug/l (subject to approval by the Court of

the application of a new criteria) from migrating east of Maple Road shall apply to the Eastern Area System, regardless of the aquifer designation, or depth of groundwater or groundwater contamination.

b. Prohibition Zone Containment Objective. Use of groundwater in the Prohibition Zone and Expanded Prohibition Zone will be governed by the Prohibition Zone Order regardless of the aquifer designation or the depth of the groundwater or groundwater contamination. MDNRE-approved legal notice of the proposed Prohibition Zone expansion shall be provided at Defendant's sole expense.

2. Eastern Area Response Activities. The following response actions shall be implemented:

a. Maple Road Extraction. Defendant shall continue to operate TW-19 as necessary to meet the Maple Road containment objective.

b. Verification Plan. Defendant shall implement its June 3, 2009 Plan for Verifying the Effectiveness of Proposed Remedial Obligations ("Verification Plan"), as modified by this Sections V.A.2.b. and c., to ensure that any potential migration of groundwater contamination outside of the Expanded Prohibition Zone is detected before such migration occurs. Defendant shall install four additional monitoring well clusters in the Evergreen Subdivision area at the approximate locations indicated on the map attached as Attachment F. If concentrations of 1,4-dioxane in one or more of the three new monitoring wells installed at the perimeter of the Expanded Prohibition Zone or the existing MW-120s, MW-120d, MW-121s, and MW-121d exceed 20 ug/l, Defendant shall conduct a hydrogeological investigation to determine the fate of any groundwater contamination in this area as described in the Verification Plan. This investigation will be conducted pursuant to a MDNRE-approved work plan. The

work plan shall be submitted within 45 days after the first exceedence. If concentrations in any of the perimeter wells exceed 85 ug/l (or any other criteria approved by the Court) or if the Defendant's investigation or monitoring indicates that the plume of groundwater contamination will migrate outside of the Prohibition Zone or Expanded Prohibition Zone, Defendant shall conduct a Feasibility Study of available options for addressing the situation pursuant to a MDNRE-approved format. The Feasibility Study shall be submitted within 90 days after a determination by the Defendant or a written notification by the MDNRE that one is required. This Feasibility Study shall include options other than simply expanding the Prohibition Zone or Expanded Prohibition Zone, although that option may be included in the analysis. The parties agree that any further expansion of the northern boundaries of the Prohibition Zone or Expanded Prohibition Zone to address migration of groundwater contamination outside of the Prohibition Zone or Expanded Prohibition Zone should be avoided, unless there are compelling reasons to do so. The Defendant's Feasibility Study shall identify a preferred alternative. The MDNRE shall review the Feasibility Study and either approve the Defendant's preferred alternative or submit changes as provided in Section X of the Consent Judgment. The Defendant shall implement the approved alternative, or any changes submitted by the MDNRE unless the Defendant initiates Dispute Resolution under Section XVI of the Consent Judgment.

c. Additional Evergreen Monitoring Wells. Defendant shall install the new well clusters described in Section V.A.2.b. according to a schedule to be approved by the MDNRE . Each of the new well clusters will include two to three additional monitoring wells, and the determination of the number of wells shall be based on the Parties' evaluation of the geologic conditions present at each location, consistent with past practice. The easternmost of these well clusters shall be installed last and the data obtained from the other newly installed

well clusters and existing wells will be used to determine the location of the easternmost well cluster. The easternmost well cluster will be installed approximately one year after the other well clusters are installed and after the Parties have been able to evaluate at least four quarters of data from the new wells and existing well, unless the Parties agree that it should be installed sooner.

d. Drilling Techniques. Borings for new wells installed pursuant to Section V.A.2. shall be drilled to bedrock unless a different depth is approved by MDNRE or if conditions make such installation impracticable. The MDNRE reserves the right to require alternate drilling techniques to reach bedrock if standard methods are not able to do so. If the Defendant believes that drilling one or more of these wells to bedrock is not practical due to the geologic conditions encountered and/or that such conditions do not warrant the alternative drilling technique required by the MDNRE, Defendant may initiate dispute resolution under Section XVI of the Consent Judgment. The wells shall be installed using Defendant's current vertical profiling techniques, which are designed to minimize the amount of water introduced during drilling, unless the MDNRE agrees to alternate techniques.

e. Downgradient Investigation. The Defendant shall continue to implement its Downgradient Investigation Work Plan as approved by the MDNRE on February 4, 2005, to track the groundwater contamination as it migrates to ensure any potential migration of groundwater contamination outside of the Prohibition Zone or Expanded Prohibition Zone is detected before such migration occurs.

f. Continued Evergreen Subdivision area Groundwater Extraction as Necessary. The Defendant shall continue to operate the Evergreen Subdivision area extraction wells LB-1 and LB-3 (the "LB Wells") at a combined purge rate of 100 gallons per minute

(gpm), in order to reduce the migration of 1,4-dioxane, until such time as it determines that the Eastern Area cleanup objectives will be met at a reduced extraction rate or without the need to operate these extraction wells. Before significantly reducing or terminating extraction from the LB Wells, the Defendant shall consult with Plaintiffs and provide a written analysis, together with the data that supports its conclusion. MDNRE will review the analysis and data and provide a written response to Defendants within 56 days after receiving Defendant's written analysis and data. If the MDNRE disagrees with the Defendant's decision to reduce or terminate extraction, it may dispute the decision in Court within 15 days of its written response. Within 15 days of the filing of MDNRE's dispute, Defendant may file a response to the petition. The Parties may agree to extend these time frames to facilitate resolution of the dispute. The Defendant shall not significantly reduce or terminate extraction from the LB Wells while MDNRE is reviewing or disputing the Defendant's determination. MDNRE will make all reasonable efforts to have the motion resolved in a reasonable timeframe. If extraction from the LB Wells is terminated either by the agreement of the Parties or an order of the Court, the Defendant shall continue to maintain the LB Wells in an operable condition until such time as the Parties agree (or the Court decides) that the well(s) may be abandoned. Defendant shall abandon the Allison Street (AE-3) extraction well operation upon entry of this Third Amendment.

g. Well Identification. Defendant shall implement the Expanded Prohibition Zone Well Identification Work Plan as approved by MDNRE on February 4, 2011, pursuant to the approved schedule, unless Defendant files a Petition with the Court by March 16, 2011, seeking clarification of the scope of this Court's Prohibition Zone Order.

h. Plugging of Private Water Supply Wells. The Prohibition Zone Order's requirement that Defendant plug and replace any private drinking water wells by connecting those properties to municipal water shall apply to the Expanded Prohibition Zone. Defendant shall also properly plug non-drinking water wells in the Expanded Prohibition Zone unless it petitions the Court to clarify whether the Prohibition Zone Order requires Defendant to plug such wells and the Court determines it does not.

3. Future Inclusion of Triangle Property in the Expanded Prohibition Zone. MDNRE may request that the triangle piece of property located along Dexter/M-14 (Triangle Property) be included in the Expanded Prohibition Zone if the data obtained from the monitoring wells installed pursuant to Section V.A.2.c., above, (specifically, the Wagner Road and Ironwood/Henry monitoring wells) and other nearby wells indicate that the chemical and hydraulic data does not support Defendant's conceptual model regarding groundwater and contaminant flow in the area. Defendant may dispute such request pursuant to Section XVI of this Consent Judgment.

a. If the Triangle Property is later included in the Expanded Prohibition Zone, any further expansion beyond the Triangle Property shall be subject the same Feasibility Study requirements of Section V.A.2.b.

b. If a drinking water supply well is installed on the Triangle Property in the future, Defendant shall take the necessary steps to obtain permission to sample the well on a schedule approved by the MDNRE. Defendant shall monitor such wells on the MDNRE-approved schedule unless or until that property is included in the Expanded Prohibition Zone, at which time, the water supply well(s) shall be addressed as part of the well identification process.

4. Operation and Maintenance. Subject to Section V.A.2.f and V.A.7., Defendant shall operate and maintain the Eastern Area System as necessary to meet the Eastern Area Objectives. Defendant shall continuously operate, as necessary, and maintain the Eastern Area System according to MDNRE-approved operation and maintenance plans until Defendant is authorized to terminate extraction well operations pursuant to Section V.D.1.a.

5. Treatment and Disposal. Groundwater extracted by the extraction well(s) in the Eastern Area System shall be treated (as necessary) using methods approved by the MDNRE and disposed of using methods approved by the MDNRE, including, but not limited to, the following options:

a. Groundwater Discharge. The purged groundwater shall be treated to reduce 1,4-dioxane concentrations to the level required by the MDNRE, and discharged to groundwaters at locations approved by MDNRE in compliance with a permit or exemption authorizing such discharge.

b. Sanitary Sewer Discharge. Use of the sanitary sewer leading to the Ann Arbor Wastewater Treatment Plant is conditioned upon approval of the City of Ann Arbor. If discharge is made to the sanitary sewer, the Eastern Area System shall be operated and monitored in compliance with the terms and conditions of an Industrial User's Permit from the City of Ann Arbor, and any subsequent written amendment of that permit made by the City of Ann Arbor. The terms and conditions of any such permit and any subsequent amendment shall be directly enforceable by the MDNRE against Defendant as requirements of this Consent Judgment.

c. Storm Drain Discharge. Use of the storm drain is conditioned upon issuance of an NPDES permit and approval of such use by the City of Ann Arbor and the



Allen Creek Drainage District. Discharge to the Huron River via the Ann Arbor stormwater system shall be in accordance with the NPDES Permit and conditions required by the City and the Drainage District. If the storm drain is to be used for disposal, no later than twenty-one (21) days after permission is granted by the City and the Drainage District to use the storm drain for disposal of purged groundwater, Defendant shall submit to MDNRE, the City of Ann Arbor, and the Drainage District for their review and approval, a protocol under which the purge system shall be temporarily shut down: (i) for maintenance of the storm drain and (ii) during storm events to assure that the stormwater system retains adequate capacity to handle run-off created during such events. The purge system shall be operated in accordance with the approved protocol for temporary shutdown.

d. Existing or Additional/Replacement Pipeline to Wagner Road Treatment Facility. Installation of an additional pipeline or a pipeline replacing the existing pipeline to the Wagner Road Treatment Facility is conditioned upon approval of such installation by the MDNRE. If the pipeline is proposed to be installed on public property, the pipeline installation is conditioned upon approval of such installation by the City of Ann Arbor, Scio Township, and the Washtenaw County Road Commission, if required by statute or ordinance, or by Order of the Court pursuant to the authority under MCL 324.20135a. Defendant shall design the pipeline in compliance with all state requirements and install the pipeline with monitoring devices to detect any leaks. If leaks are detected, the system will automatically shut down and notify an operator of the condition. In the event that any leakage is detected, Defendant shall take any measures necessary to repair any leaks and perform any remediation that may be necessary. To reduce the possibility of accidental damage to the pipeline during any future construction, the location of the pipeline will be registered with MISS DIG System, Inc. Nothing

in this subsection shall relieve Defendant of its obligations to properly treat and dispose of contaminated groundwater in compliance with the Consent Judgment and applicable permit(s), using one or more of the other options for disposal, as necessary.

e. Additional Pipeline from Maple Road Extraction Well(s).

Installation and operation of a proposed pipeline from the Maple Road Area to Evergreen area is conditioned upon approval of such installation and operation by the MDNRE. If the pipeline is proposed to be installed on public property, the pipeline installation is conditioned upon approval of such installation by the appropriate local authorities, if required by statute or ordinance, or Order of the Court pursuant to the authority under MCL 324.20135a. Defendant shall design any such pipeline in compliance with all state requirements and install it with monitoring devices to detect any leaks. In the event any leakage is detected, Defendant shall take any measures necessary to repair any leaks and perform any remediation that may be necessary. The pipeline shall be registered with the MISS DIG System, Inc., to reduce the possibility of accidental damage to the pipeline. Defendant may operate such pipeline to, among other things, convey groundwater extracted from TW-19 to the Wagner Road treatment systems, where it can be treated and disposed via the Defendant's permitted surface water discharge (capacity permitting).

6. Monitoring Plans. Defendant shall implement a MDNRE-approved monitoring plan for the Eastern Area. The monitoring plans shall include the collection of data to measure the effectiveness of the System in (a) ensuring that any potential migration of groundwater contamination outside of the Prohibition Zone or Expanded Prohibition Zone is detected before such migration occurs; (b) tracking the migration of the groundwater contamination to determine the need for additional investigation to ensure that there are adequate monitoring points to meet objective in Subsection (a) of this Section, including the determination

of the fate of groundwater contamination when and if it reaches the portion of the Huron River that is the easternmost extent of the Prohibition Zone; (c) verifying that concentrations of 1,4-dioxane greater than the groundwater-surface water interface criterion of 2800 ug/l (or any other criterion approved by the Court) does not migrate east of Maple Road; (d) complying with the applicable limitations on the discharge of the purged groundwater; and (e) evaluating capture areas for extraction wells and potential changes in groundwater flow from changes in extraction rates and locations.

To satisfy the objectives of this Section V.A.6, Defendant shall implement the following monitoring plans:

a. The portion of Defendant's Comprehensive Groundwater Monitoring Plan, May 4, 2009, amended June 2, 2009 (ACGMP), relevant to the Eastern Area, upon approval of the MDNRE as provided in Section X. Defendant shall continue to implement the currently approved monitoring plan until MDNRE approves the final ACGMP for the Eastern Area.

b. Defendant's Performance Monitoring Plan for Maple Road, which shall include the existing MW-84d as a monitoring point in lieu of the previously requested additional monitoring well closer to Maple Road, which shall be incorporated into the ACGMP for the Eastern Area.

The monitoring plans shall be continued until terminated pursuant to Section V.E.

7. Wagner Road Extraction. TW-18 and TW-21 (the "Wagner Road Wells") shall be considered part of the Eastern Area System even though they are located just West of Wagner Road. The Defendant shall initially operate the Wagner Road Wells at a combined 200 gallons per minute (gpm) extraction rate (with a minimum extraction rate of 50 gpm for each of

the wells). The Defendant shall continue to operate its Wagner Road Wells in order to reduce the migration of 1,4-dioxane east of Wagner Road at this rate until such time as it determines that the Eastern Area cleanup objectives will be met with a lower combined extraction rate or without the need to operate these wells. Before significantly reducing or terminating extraction from the Wagner Road Wells, Defendant shall consult with Plaintiffs and provide a written analysis, together with the data that supports its conclusion. MDNRE will review the analysis and data and provide a written response to Defendants within 56 days after receiving Defendant's written analysis and data. If the MDNRE disagrees with the Defendant's decision to reduce or terminate extraction, it may dispute the decision in Court within 15 days of the date of its written response. Within 15 days of the filing of MDNRE's dispute, Defendant may file a response to the petition. The Parties may agree to extend these time frames to facilitate resolution of the dispute. The Defendant shall not significantly reduce or terminate the Wagner Road extraction while MDNRE is reviewing or disputing the Defendant's determination. MDNRE will make all reasonable efforts to have the motion resolved in a reasonable timeframe.

8. Options Array for Transmission Line Failure/Inadequate Capacity.

The Defendant has provided the MDNRE with documentation regarding the life expectancy of the deep transmission line and an Options Array (attached as Attachment G). The Options Array describes the various options that may be available if the deep transmission line fails or the 200 gpm capacity of the existing deep transmission line that transports groundwater from the Eastern Area System to the treatment system located on the GSI Property proves to be insufficient to meet the Eastern Area Objectives.

FIFTH, delete the existing Section V.B. and replace with the following:

B. Western Area System

1. Western Area System Non-Expansion Cleanup Objective. The Defendant shall prevent the horizontal extent of the groundwater contamination in the Western Area from expanding. The horizontal extent shall be the maximum horizontal areal extent of groundwater contamination regardless of the depth of the groundwater contamination (as established under Section V.B.2.c. of this Consent Judgment). Continued migration of groundwater contamination into the Prohibition Zone or Expanded Prohibition Zone shall not be considered expansion and is allowed. A change in the horizontal extent of groundwater contamination resulting solely from the Court's application of a new cleanup criterion shall not constitute expansion. Nothing in this Section prohibits the Plaintiffs from seeking additional response activities pursuant to Section XVIII.E of this Consent Judgment. Compliance with the Non-Expansion Cleanup Objective shall be established and verified by the Compliance Well Network to be developed by the Parties as provided in Sections V.B.2.c and d., below ("Compliance Well Network"). There is no independent mass removal requirement or a requirement that the Defendant operate any particular extraction well(s) at any particular rate beyond what is necessary to prevent the prohibited expansion, provided that Defendant's ability to terminate all groundwater extraction in the Western Area is subject to Section V.D.1.c. and the establishment of property use restrictions as required by Section V.B.2.e. If prohibited expansion occurs, Defendant shall undertake additional response activities to return the groundwater contamination to the boundary established by the Compliance Well Network (such response activities may include recommencement of extraction at particular locations).

Plaintiffs agree to modify the remedial objective for the Western Area as provided herein to a no expansion performance objective in reliance on Defendant's agreement to comply with a no expansion performance objective for the Western Area. To ensure compliance with this

objective, Defendant acknowledges that in addition to taking further response action to return the horizontal extent of groundwater contamination to the boundary established by the Compliance Well Network, Defendant shall be subject to stipulated penalties for violation of the objective as provided in Section XVII. Nothing in this paragraph shall limit Defendant's ability to contest the assessment of such stipulated penalties as provided in this Consent Judgment.

2. Western Area Response Activities. The following response activities shall be implemented:

a. Extraction Wells. The Western Area response activities shall include the operation of groundwater extraction wells as necessary to meet the objective described in Section V.B.1. Purged groundwater from the Western Area System shall be treated with ozone/hydrogen peroxide or ultraviolet light and oxidizing agent(s), or such other method approved by the MDNRE to reduce 1,4-dioxane concentrations to the level as required by NPDES Permit No. MI-0048453, as amended or reissued. Discharge to the Honey Creek tributary shall be in accordance with NPDES Permit No. MI-0048453, as amended or reissued.

b. Decommissioning Extraction Wells. Within 14 days after entry of this Third Amendment, Defendant shall submit to MDNRE a list of Western Area extraction wells that it intends to decommission (take out-of-service) in 2011. The MDNRE has the right to petition the Court to stop the Defendant from taking such extraction well(s) out-of-service within 60 days of receiving the list identifying such extraction well(s). The Defendant shall maintain all other extraction wells, including, but not limited to, TW-2 (Dolph Park) and TW-12, in operable condition even if it subsequently terminates extraction from the well(s) until such time as the Parties agree (or the Court decides) that the well(s) may be abandoned.

c. Western Area Delineation Investigation. Defendant shall complete the following investigation, as may be amended by agreement of the Parties to reflect data obtained during the investigation, to address gaps in the current definition of the plume and to further define the horizontal extent of groundwater contamination in the Western Area:

- i. Install monitoring wells screened to monitor the intermediate (Unit D2) and deep (Unit E) zones at/near the existing MW-20. An additional monitoring well at or near existing MW-36 will not be necessary unless the results from the wells installed at/near MW-20 are inconsistent with the Defendant's conceptual flow model (that the contamination in the shallower unit does not continue migrating to the west, but instead drops into the deeper unit and flows east into the Prohibition Zone or Expanded Prohibition Zone).
- ii. Install a monitoring well cluster just west of Wagner Road and South of I-94.
- iii. Install a monitoring well cluster in the Nancy Drive/MW-14d area, to define the extent of groundwater contamination from surface to bedrock, with final placement of the cluster to be determined after the Wagner Road/I-94 well cluster is installed or as otherwise agreed.
- iv. Install a monitoring well screened to monitor the deep (Unit E) zone near/at MW-125, with location to be approved by MDNRE. PLS will vertically profile every ten feet throughout the deep (Unit E) saturated interval.

Defendant shall promptly provide the data/results from the investigation to the MDNRE so that the MDNRE receives them prior to Defendant's submission of the Monitoring Plan described in Subsection V.B.2.d, below. MDNRE reserves the right to request the installation of additional borings/monitoring wells, if the totality of the data from the wells to be installed indicate that the horizontal extent of groundwater contamination has not been completely defined.

d. Compliance Monitoring Well Network/Performance Monitoring Plan. Within 15 days of completing the investigation described in Subsection V.B.2.c, above, Defendant shall submit a Monitoring Plan, including Defendant's analysis of the data obtained during the investigation for review and approval by the MDNRE. The Monitoring Plan shall include the collection of data from a compliance monitoring well network sufficient to verify the

effectiveness of the Western Area System in meeting the Western Area objective set forth in Section V.B.1. The locations and/or number of the compliance monitoring wells for the Monitoring Plan will be determined based on the data obtained from the investigation Defendant shall conduct pursuant to Section V.B.2.c. The MDNRE shall approve the Monitoring Plan, submit to Defendant changes in the Monitoring Plan that would result in approval, or deny the Monitoring Plan within 35 days of receiving the Monitoring Plan. Defendant shall either implement the MDNRE-approved Monitoring Plan, including any changes required by MDNRE, or initiate dispute resolution pursuant to Section XVI of this Consent Judgment. Defendant shall implement the MDNRE (or Court)-approved Monitoring Plan to verify the effectiveness of the Western Area System in meeting the Western Area objective. Defendant shall continue to implement the current MDNRE-approved monitoring plan(s) until MDNRE approves the Monitoring Plan required by this Section. The monitoring program shall be continued until terminated pursuant to Section V.E.

e. Property Restrictions. The Defendant shall have property use restrictions that are sufficient to prevent unacceptable exposures in place for any properties affected by Soil Contamination or Groundwater Contamination before completely terminating extraction in the Western Area.

3. Internal Plume Characterization. Additional definition within the plume and/or characterization of source areas, except as may be required under Section VI of this Consent Judgment, is not necessary based on the additional monitoring wells to be installed as provided in Section V.B.2.c. MDNRE reserves the right to petition the Court to require such work if there are unexpected findings that MDNRE determines warrants additional characterization.



SIXTH, modify Section V.C. to read as follows:

C. Little Lake Area System

1. Little Lake Area System Non-Expansion Objective. The objective of the Little Lake Area System is to prevent expansion of the horizontal extent of any groundwater contamination located in this area.

2. Response Activities. Defendant shall implement some form of active remediation in this area until the termination criterion is reached under Section V.D.1.d. or appropriate land or resource use restrictions on the affected property(ies) approved by the MDNRE are in place. Defendant shall continue its batch purging program from the extraction well located on the Ann Arbor Cleaning Supply property pursuant to MDNRE-approved plans unless some other form of active remediation is approved by the MDNRE. Defendant may resubmit a proposal to temporarily reduce the frequency of the batch purging of this well so that the effects of batch purging can be evaluated. Defendant shall also have the option of obtaining appropriate land use or resource use restrictions on the affected property(ies) as an alternative to active remediation in this area, conditioned on MDNRE's approval.

3. Monitoring Plan. Within 45 days of entry of this Third Amendment, Defendant shall submit to the MDNRE for approval under Section X of this Consent Judgment a revised Monitoring Plan that identifies which of the existing monitoring wells will be used as compliance wells to verify the effectiveness of the Little Lake Area System in meeting the non-expansion objective of Section V.C.1. Defendant shall continue to implement the current MDNRE-approved monitoring plan until MDNRE approves the Monitoring Plan required by this Section. If a form of active remediation other than batch purging or land use or resource use

restrictions are approved by the MDNRE, Defendant shall submit a revised monitoring plan, modified as necessary to verify the effectiveness of such response activities.

The monitoring plan shall be continued until terminated pursuant to Section V.E.

SEVENTH, modify Section V.D.1 to read as follows:

D. Termination of Groundwater Extraction Systems

1. Defendant may only terminate the Groundwater Extraction Systems listed below as provided below:

a. Termination Criteria for LB Wells/Wagner Road Wells. Except as otherwise provided pursuant to Section V.D.2, Defendant may only significantly reduce or terminate operation of the LB Wells and the Wagner Road Wells as provided in Sections V.A.2.f. and V.A.7., respectively.

b. Termination Criteria for TW-19. Except as otherwise provided pursuant to Section V.D.2, Defendant shall maintain TW-19 in an operable condition and operate as needed to meet the groundwater-surface water interface criterion containment objective until all approved monitoring wells upgradient of Maple Road are below the groundwater surface water interface criterion for six consecutive months or until Defendant can establish to the satisfaction of MDNRE that additional purging from TW-19 is no longer necessary to satisfy the containment objective at this location. If Defendant requests to decommission TW-19, Defendant's request must be made in writing for review and approval pursuant to Section X of the Consent Judgment. The request must include all supporting documentation demonstrating compliance with the termination criteria. Defendant may initiate dispute resolution pursuant to Section XVI of this Consent Judgment if the DNRE does not approve Defendant's request. Defendant may decommission TW-19 upon: (i) receipt of notice of approval from MDNRE; or

(ii) receipt of notice of a final decision approving termination pursuant to dispute resolution procedures of Section XVI of this Consent Judgment. Defendant shall not permanently plug TW-19 until completion of the post-termination monitoring pursuant to Section V.E.1.b.

c. Termination Criteria for Non-Expansion Objective for Western Area. Except as otherwise provided pursuant to Section V.D.2, and subject to Section V.B.1., Defendant shall not terminate all groundwater extraction in the Western Area until:

i. Defendant can establish to Plaintiffs' satisfaction that groundwater extraction is no longer necessary to prevent the expansion of groundwater contamination prohibited under Section V.B.1. Defendant's demonstration shall also establish that any remaining 1,4-dioxane contamination in the Marshy and Soil Systems will not cause any prohibited expansion of groundwater contamination; and

ii. Defendant has the land use or resource use restrictions described in Section V.B.2.e. in place.

Defendant's request to terminate extraction in the Western Area must be made in writing for review and approval pursuant to Section X of the Consent Judgment. The request must include all supporting documentation demonstrating compliance with the termination criteria. Defendant may initiate dispute resolution pursuant to Section XVI of the Consent Judgment if the MDNRE does not approve the Defendant's request/demonstration. Defendant may terminate Western Area groundwater extraction upon: (i) receipt of notice of approval from MDNRE; or (ii) receipt of notice of a final decision approving termination pursuant to dispute resolution procedures of Section XVI of this Consent Judgment.

d. Termination Criteria for Little Lake Area Well (a/ k/a Ann Arbor Cleaning Supply Well). Except as otherwise provided pursuant to Section V.D.2., Defendant

shall continue to operate the Ann Arbor Supply Well on a batch purging basis (or implement another form of MDNRE-approved active remediation) until six consecutive monthly tests of samples from the extraction well and associated monitoring wells, fail to detect the presence of groundwater contamination or until appropriate land use restrictions are placed on the affected property(ies).

EIGHTH, delete Sections V.D.4 and V.D.5 .

NINTH, modify Section V.E. to read as follows:

E. Post-Termination Monitoring

1. Eastern Area

a. Prohibition Zone Containment Objective. Except as otherwise provided pursuant to Section V.D.2, Defendant shall continue to monitor the groundwater contamination as it migrates within the Prohibition Zone and Expanded Prohibition Zone until all approved monitoring wells are below 85 ug/l or such other applicable criterion for 1,4-dioxane for six consecutive months, or Defendant can establish to MDNRE's satisfaction that continued monitoring is not necessary to satisfy the Prohibition Zone containment objective. Defendant's request to terminate monitoring must be made in writing for review and approval pursuant to Section X of the Consent Judgment. Defendant may initiate dispute resolution pursuant to Section XVI of this Consent Judgment if the MDNRE does not approve its termination request.

b. Groundwater/Surface Water Containment Objective. Except as provided in Section V.E.1.a., for Prohibition Zone monitoring wells, post-termination monitoring is required for Eastern Area wells for a minimum of 10 years after purging is terminated under Section V.D.1.b. with cessation subject to MDNRE approval. Defendant's request to terminate monitoring must be made in writing for review and approval pursuant to

Section X of the Consent Judgment. Defendant may initiate dispute resolution pursuant to Section XVI of this Consent Judgment if the MDNRE does not approve its termination request.

c. Maple Road Extraction. If Defendant has decommissioned TW-19 based on monitoring well results showing that upgradient monitoring wells are below the groundwater/surface water interface criterion (rather than a demonstration) as provided in Section V.D.1.b and the monitoring conducted pursuant to Section V.E.1.b. reveal that the termination criterion is no longer being met, Defendant shall immediately notify MDNRE and collect a second sample within 14 days of such finding. If any two consecutive samples are found at or above the termination criterion, then Defendant shall take the steps necessary to put TW-19 in an operable condition and operate the well as necessary to satisfy the groundwater/surface interface water containment objective unless it can establish to Plaintiffs' satisfaction that such actions are not necessary to meet the groundwater/surface water interface containment objective.

2. Western Area. Post-termination monitoring will be required for a minimum of ten years after termination of extraction with cessation subject to MDNRE approval. Except as otherwise provided pursuant to Section V.D.2, Defendant shall continue to monitor the groundwater in accordance with approved monitoring plan(s), to verify that it remains in compliance with the no expansion performance objective set forth in Section V.B.1. If any violation is detected, Defendant shall immediately notify MDNRE and take whatever steps are necessary to comply with the requirements of Section V.B.1.

3. Little Lake Area System. Post-termination monitoring will be required for a minimum of ten years after termination of active remediation in the Little Lake Area with cessation subject to MDNRE approval. Defendant shall continue to monitor the Ann Arbor

Cleaning Supply extraction well and/or associated monitoring wells, in accordance with approved monitoring plans to verify that:

a. the concentration of 1,4-dioxane in the groundwater does not exceed the termination criterion. If such post-termination monitoring reveals the presence of 1,4-dioxane in excess of the termination criterion, Defendant shall immediately notify MDNRE and shall collect a second sample within 14 days of such finding. If any two consecutive samples are found at or above the termination criterion, Defendant shall immediately restart the previously-approved method of active remediation, unless Defendant has obtained appropriate land use or resource use restrictions on the affected property(ies) pursuant to Section V.C.2, (in which case subsection b, below shall apply); or

b. 1,4-dioxane in excess of the termination criterion is not migrating outside the MDNRE-approved area of land use or resource use restrictions.

TENTH, delete Section V.F.

ELEVENTH, modify the first paragraph of Section VI to read as follows:

Defendant shall design, install, operate, and maintain the systems described below to control, remove, and treat Soil Contamination at the GSI Property and remove and treat groundwater from the Marshy Area located north of former Ponds I and II as necessary to: (a) prevent the migration of 1,4-dioxane from contaminated soils into any aquifer in concentrations that cause the expansion of groundwater contamination in violation of Section V.B.1 of this Consent Judgment; (b) prevent venting of groundwater into Honey Creek Tributary with 1,4-dioxane in quantities that cause the concentration of 1,4-dioxane at the groundwater-surface water interface of the Tributary to exceed 2800 ug/l; and (c) prevent venting of groundwater to Third Sister Lake with 1,4-dioxane in quantities that cause of the concentration of 1,4-dioxane at

the groundwater-surface water interface of the Lake to exceed 2800 ug/l. Defendant also shall implement a monitoring plan to verify the effectiveness of these systems.

TWELTH, modify Section VI.A. to read as follows:

1. Objectives. The objectives of this System are to: (a) prevent expansion of groundwater contamination prohibited under Section V.B.1.; and (b) prevent the discharge of contaminated groundwater from the Marshy Area into the Honey Creek Tributary in quantities that cause the concentration of 1,4-dioxane at the groundwater-surface water interface of the Tributary to exceed 2800 ug/l.

2. Response Activities. Defendant shall operate the Marshy Area System described in Defendant's May 5, 2000 Final Design and Effectiveness Monitoring Plan, as subsequently modified and approved by the MDNRE as necessary to meet the objectives of the Marshy Area System until its operation may be terminated under Section VI.D. of this Consent Judgment.

3. Monitoring. Defendant shall implement the MDNRE-approved monitoring plan to verify the effectiveness of the Marshy Area System in meeting the requirements of this Consent Judgment. The monitoring plan shall be continued until terminated pursuant to Section VI.D. of this Consent Judgment.

THIRTEENTH, modify Section VI.B.1 by replacing "2000 ug/l" with "2800 ug/l".

FOURTEENTH, renumber Sections VI.B.4 and VI.B.5 to VI.B.3 and VI.B.4, respectively, and modify new Section VI.B.3.c. to read as follows:

c. If Soil Contamination is identified in any of the areas investigated, Defendant shall submit, together with the report required in Section VI.B.3.b., an analysis of whether such Soil Contamination will cause the expansion of Groundwater Contamination prohibited under Section V.B.1. or venting of groundwater to Third Sister Lake with 1,4-dioxane

in quantities that cause of the concentration of 1,4-dioxane at the groundwater-surface water interface of the Lake to exceed 2800 ug/l. If either will occur, Defendant shall submit a remediation plan for that area that achieves the overall objectives of Section VI. The plan shall include a proposed schedule for implementation. The remediation system shall be installed, operated, and terminated in accordance with the approved plan.

FIFTEENTH, modify Section VI.C.1. to read as follows:

1. Objectives. The objectives of this program are to: (a) evaluate the necessity, feasibility and effectiveness of available options for remediation of identified source areas; (b) design and implement remedial systems, if necessary, to achieve the overall objectives of Section VI; and (c) verify the effectiveness of those systems.

SIXTEENTH, modify Section VI.C.2. to read as follows:

2. Soils Remediation Plan. Defendant shall, no later than November 30, 1996 submit to MDEQ for review and approval a revised soils remediation plan for addressing identified areas of soil contamination. The areas to be addressed include the burn pit; the former Pond I area; the former Pond II area; the former Lift Station Area; and Pond III.

The Defendant's proposal must attain the overall objectives of Section VI.

SEVENTEENTH, modify Section VI.D.1 to read as follows:

1. Termination Criteria for GSI Property Remediation. Defendant shall continue to operate each of the GSI Property Remedial Systems, including the Marshy Area System until Defendant can make a demonstration to Plaintiffs' satisfaction that 1,4-dioxane remaining in any of the areas addressed would not cause: a) any expansion of groundwater



contamination in the Western Area as prohibited in Section V.B.1; or b) venting of groundwater into the Honey Creek Tributary or to the Third Sister Lake in quantities that cause the concentration of 1,4-dioxane at the groundwater-surface water interface of the Tributary or Lake to exceed 2800 ug/l. The demonstration described in this Section must be made in writing for review and approval by MDNRE pursuant to Section X of the Consent Judgment, and approved by MDNRE before Defendant terminates all groundwater extraction in the Western Area. Defendant may initiate dispute resolution pursuant to Section XVI of this Consent Judgment if MDNRE does not approve Defendant's demonstration. These Systems shall also be subject to the same post-termination monitoring as the Western Area System, described in Section V.E.2.

EIGHTEENTH, delete Sections VI.D.2., 4., and 5, and renumber VI.D.3 as VI.D.2

NINTEENTH, modify Section VII.D.1 by replacing "MI-008453" with MI-0048453"

TWENTIETH, modify Sections VII.D.5. and 6. to read as follows:

5. Permit(s) or permit exemptions to be issued by the MDNRE to authorize the reinjection of purged and treated groundwater in the Eastern Area, Western Area, and Little Lake Area;
6. Surface water discharge permit(s) for discharge into surface waters in the Little Lake System Area, if necessary;

TWENTY-FIRST, modify Section X to read as follows:

Upon receipt of any plan, report, or other items that is required to be submitted for approval pursuant to this Consent Judgment, as soon as practicable, but in no event later than 56 days after receipt of such submission, except for a feasibility analysis or plan that proposes a risk based cleanup or requires public comment submitted pursuant to Section V.A.2.b., of this Consent Judgment, the Plaintiff will: (1) approve the submission; or (2) submit to Defendant changes in the submission that would result in approval of the submission. Plaintiff will (1) approve a Feasibility Study or plan that proposes a risk based cleanup or a remedy that requires public comment; or (2) submit to Defendant changes in such submittal that would result in approval in the time provided under Part 201 of the Natural Resources and Environmental Protection Act, as amended, [MCL 324.20101 *et seq.*]. If Plaintiffs do not respond within 56 days, or 180 days, respectively, Defendant may submit the matter to Dispute Resolution pursuant to Section XVI. Upon receipt of a notice of approval or changes from the Plaintiffs, Defendant shall proceed to take any action required by the plan, report or other item, as approved or as may be modified to address the deficiencies identified by Plaintiffs. If Defendant does not accept the changes proposed by Plaintiffs, Defendant may submit the matter to Dispute Resolution pursuant to Section XVI.

TWENTY-SECOND, modify the first two sentences of Section XI.A., to read as follows:

A. Plaintiffs designate Sybil Kolon as Plaintiffs' Project Coordinator. Defendant designates Farsad Fotouhi, Vice President of Corporate Environmental Engineering, as Defendant's Project Coordinator.

TWENTY-THIRD, modify Section XIII.A. as follows:

A. Defendant shall not sell, lease, or alienate the GSI Property until: (1) it places an MDNRE approved land use or resource use restrictions on the affected portion(s) of the GSI

Property; and (2) any purchaser, lessee, or grantee provides to Plaintiffs its written agreement providing that the purchaser, lessee, or grantee will not interfere with any term or condition of this Consent Judgment. Notwithstanding any purchase, lease, or grant, Defendant shall remain obligated to comply with all terms and conditions of this Consent Judgment.

TWENTY-FORTH, modify Section XVI.A. by adding the following clause to the beginning of the section:

A. Except as provided in Sections V.A.2.f., V.A.7., and V.D.1.a., the dispute resolution procedures of this Section shall ...

TWENTY-FIFTH, modify Section XVII.E as follows:

E. Stipulated penalties shall be paid no later than 14 working days after receipt by Defendant of a written demand from Plaintiffs. Defendant shall make payment by transmitting a check in the amount due, payable to the "State of Michigan", addressed to the Revenue Control Unit; Finance Section, Administration Division; Michigan Department of Natural Resources and Environment; P.O. Box 30657; Lansing, MI 48909-8157. Via Courier to the Revenue Control Unit; Finance Section, Administration Division; Michigan Department of Natural Resources and Environment; Constitution Hall, 5<sup>th</sup> Floor South Tower; 525 West Allegan Street; Lansing, MI 48933-2125. To ensure proper credit, include the settlement ID - ERD1902 on the payment.

TWENTY-SIXTH, modify Section XVIII.E to read as follows:

E. Notwithstanding any other provision in this Consent Judgment: (1) Plaintiffs reserve the right to institute proceedings in this action or in a new action seeking to require Defendant to perform any additional response activity at the Site; and (2) Plaintiffs reserve the right to institute proceedings in this action or in a new action seeking to reimburse Plaintiffs for

response costs incurred by the State of Michigan relating to the Site. Plaintiffs' rights in E.1. and E.2. apply if the following conditions are met:

1. For proceedings prior to Plaintiffs' certification of completion of the Remedial Action concerning the Site,

a. (i) conditions at the Site, previously unknown to the Plaintiffs, are discovered after entry of this Consent Judgment, (ii) new information previously unknown to Plaintiffs is received after entry of the Consent Judgment, or (iii) MDNRE adopts one or more new, more restrictive cleanup criteria for 1,4-dioxane pursuant to Part 201 of the Natural Resources and Environmental Protection Act (NREPA), MCL 324.20101 et seq., after entry of the Consent Judgment; and

b. these previously unknown conditions, new information, and/or change in criteria indicate that the Remedial Action is not protective of the public health, safety, welfare, and the environment; and

2. For proceedings subsequent to Plaintiffs' certification of completion of the Remedial Action concerning the Site,

a. (i) conditions at the Site, previously unknown to the Plaintiffs, are discovered after certification of completion by Plaintiffs, (ii) new information previously unknown to Plaintiffs is received after certification of completion by Plaintiffs, or (iii) MDNRE adopts one or more new, more restrictive cleanup criteria for 1,4-dioxane pursuant to Part 201 of NREPA, after certification of completion by Plaintiffs; and

b. these previously unknown conditions, new information, and/or change in criteria indicate that the Remedial Action is not protective of the public health, safety, welfare, and the environment.

If Plaintiffs adopt one of more new, more restrictive, cleanup criteria, Plaintiffs' rights in E.1. and E.2. shall also be subject to Defendant's right to seek another site specific criterion(ia) that is protective of public health, safety, welfare, and the environment and/or to argue that Plaintiffs have not made the demonstration(s) required under this Section.

TWENTY-SEVENTH, modify Section XX by changing the heading and adding new subsection C, as follows:

XX. INDEMNIFICATION, INSURANCE, AND FINANCIAL ASSURANCE

C. Financial Assurance

1. Defendant shall be responsible for providing and maintaining financial assurance in a mechanism approved by MDNRE in an amount sufficient to cover the estimated cost to assure performance of the response activities required, to meet, the remedial objectives of this Consent Judgment including, but not limited to investigation, monitoring, operation and maintenance, and other costs (collectively referred to as "Long-Term Costs"). Defendant shall continuously maintain a financial assurance mechanism (FAM) until MDNRE's Remediation Division (RD) Chief or his or her authorized representative notifies it in writing that it is no longer required to maintain a FAM. Defendant shall provide a FAM for MDNRE's approval within 45 days of entry of this Third Amendment.

2. Defendant may satisfy the FAM requirement set forth in this Section by satisfying the requirements of the financial test and/or corporate guarantee, attached as Attachment H, as may be amended by the Parties or by the Court upon the motion of either Party (Financial Test). Defendant shall be responsible for providing to the MDNRE financial information sufficient to demonstrate that Defendant satisfies the Financial Test. If Defendant utilizes the Financial Test to satisfy the financial assurance requirement of this Consent

Judgment, Long-Term Costs shall be documented, at Defendant's discretion, on the basis of either: a) an annual estimate of maximum costs for the response activities required by the Consent Judgment as if they were to be conducted by a person under contract to the MDNRE (MDNRE-Contractor Costs); or b) an annual estimate of maximum costs for the response activities required by the Consent Judgment as if they were to be conducted by employees of Defendant and/or contractors hired by Defendant, as applicable (Defendant's Internal Costs). In addition, Defendant shall resubmit the Financial Test and the associated required documents annually within 90 days of the end of its fiscal year or any Guarantor's fiscal year, subject to Section XX.C.4. Defendant is not required to provide another type of FAM so long as Defendant continues to meet the requirements for the Financial Test.

3. Ninety (90) days prior to the five (5)-year anniversary of the effective date of this Third Amendment to Consent Judgment, and each subsequent five (5)-year anniversary, Defendant shall provide to the MDNRE for its approval, a report (Long-Term Cost Report) containing the following:

a. If Defendant is required to provide a FAM other than the Financial Test or if Defendant's estimate of the long term costs for the Financial Test is based on Defendant's Internal Costs, then the Long-Term Cost Report shall contain the actual costs of the response activities required to meet the remedial objectives of this Consent Judgment at the Site for the previous five-year period and an estimate of the amount of funds necessary to assure the performance of the response activities required to meet the remedial objectives of this Consent Judgment at the Site for the following thirty (30)-year period given the financial trends in existence at the time of preparation of the report (Long-Term Cost Report). The Long-Term Cost Report shall also include all assumptions and calculations used in preparing the necessary

cost estimate and be signed by an authorized representative of Defendant who shall confirm the estimate is based upon actual costs. Defendant may only use a present worth analysis if an interest accruing FAM is selected; or

b. If Defendant's estimate of the Long Term Costs for the Financial Test is based on MDNRE-Contractor Costs, and the actual costs are less than the estimate, the Long-Term Cost Report shall contain a certification from Defendant that the total actual costs Defendant incurred to implement the required response activities for the previous five-year period was less than the previously provided cost estimate based on MDNRE-Contractor Costs. If actual costs are more than the estimate, then Defendant shall provide the actual cost incurred to meet the remedial objectives of this Consent Judgment for the previous five years. The Long-Term Cost Report shall also include an estimate of the amount of funds necessary to assure the performance of the response activities required to meet the remedial objectives of this Consent Judgment at the Site for the following thirty (30)-year period given the financial trends in existence at the time of preparation of the Long-Term Cost Report. The Long-Term Cost Report shall also include all assumptions and calculations used in preparing the necessary cost estimate and be signed by an authorized representative of Defendant.

4. Within 30 days of receiving MDNRE's approval of the Long-Term Cost Report, or within 90 days of the end of Defendant's (or any Guarantor's) fiscal year, whichever is later, Defendant shall resubmit its Financial Test, which shall reflect Defendant's (or, at its option, its parent corporation, Pall Corporation's) current financial information and the current estimate of the costs of the response activities required by the Consent Judgment. If this or any Financial Test indicates that Defendant (and its parent corporation, Pall Corporation if Defendant chooses to include Pall Corporation as a corporate guarantor) no longer satisfies the Financial

Test, Defendant will be required to provide to MDNRE for its approval a revised current estimate of the costs of the response activities required by the Consent Judgment to reflect the costs needed for the MDNRE to perform the necessary work using MDNRE contractors. The Parties shall negotiate a mutually acceptable alternative FAM. If the Parties are unable to reach an agreement, Plaintiffs shall provide Defendant with the FAM that will be required, which Defendant must provide unless Defendant initiates dispute resolution pursuant to Section XVI of the Consent Judgment, however during the dispute resolution process, Defendant may not challenge the underlying requirement that some type of FAM is required.

TWENTY-EIGHTH, modify Section XXIII by replacing the individual representatives of the Parties with the following individuals:

For Plaintiffs:

Sybil Kolon  
Project Coordinator  
Michigan Department  
of Natural Resources  
and Environment  
Remediation Division  
301 East Louis Glick Highway  
Jackson, MI 49201

For Defendants:

Farsad Fotouhi  
Vice President of Corporate Environmental  
Engineering  
Gelman Sciences, Inc.  
600 South Wagner Road  
Ann Arbor, MI 48106

and

Michael L. Caldwell  
Zausmer, Kaufman, August, Caldwell & Tayler,  
P.C.  
31700 Middlebelt Road, Ste. 150  
Farmington Hills, MI 48334

TWENTY-NINTH, modify Section XXVI by replacing “Attachment F” in the fourth line of that Section with “Attachment I”.



IT IS SO STIPULATED AND AGREED:

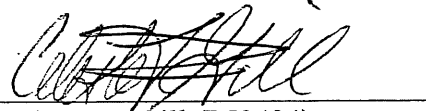
PLAINTIFFS



Dan Wyant, Director  
Michigan Department of Natural  
Resources and Environment

Dated: 3.4.11

Approved as to form:

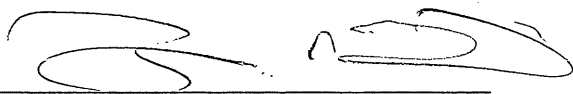


Celeste R. Gill (P52484)  
Assistant Attorney General  
Environment, Natural Resources and  
Agriculture Division  
P.O. Box 30755  
Lansing, MI 48909  
(517) 373-7540  
Attorney for Plaintiffs

Dated: 3-4-11

IT IS SO STIPULATED AND AGREED:

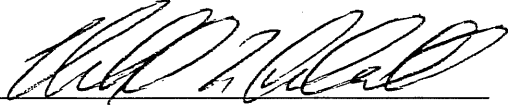
DEFENDANT



Roberto Perez  
President  
Gelman Sciences, Inc.

Dated: 3/3/11

Approved as to form:



Michael L. Caldwell (P40554)  
Zausmer, Kaufman, August,  
Caldwell & Taylor, P.C.  
31700 Middlebelt Road, Suite 150  
Farmington Hills, MI 48334  
(248) 851-4111

Dated: 3/3/11


Alan D. Wasserman (P39509)  
Williams Acosta, PLLC  
535 Griswold St. Suite 1000  
Detroit, MI 48226  
(313) 963-3873  
Attorneys for Defendant

IT IS SO ORDERED AND ADJUDGED this \_\_\_\_\_ day of MAR - 8 2011.

**/S/DONALD E. SHELTON**

\_\_\_\_\_  
HONORABLE DONALD E. SHELTON  
Circuit Court Judge

# *EXHIBIT I*

	<b>Remediation and Redevelopment Division POLICY AND PROCEDURE</b>		DEPARTMENT OF ENVIRONMENTAL QUALITY
Original Effective Date: September 30, 2004 Revised Date: May 25, 2018 Reformatted Date: May 25, 2018	Subject: Request for Calculation of Mixing Zone- Based Groundwater-Surface Water Interface Criteria		Category: <input type="checkbox"/> Internal/Administrative <input type="checkbox"/> External/Non-Interpretive <input checked="" type="checkbox"/> External/Interpretive
	Program Name: Part 201 and Part 213		Type: <input type="checkbox"/> Policy <input checked="" type="checkbox"/> Procedure <input type="checkbox"/> Policy and Procedure
	Number: RRD-33	Page: 1 of 8	

*A Michigan Department of Environmental Quality (MDEQ) Policy and Procedure cannot establish regulatory requirements for parties outside of the MDEQ. This document provides direction to MDEQ staff regarding the implementation of rules and laws administered by the MDEQ. It is merely explanatory, does not affect the rights of or procedures and practices available to the public, and does not have the force and effect of law. MDEQ staff shall follow the directions contained in this document.*

**PURPOSE:**

This procedure provides information on how to request the calculation of mixing zone-based criteria for the groundwater-surface water interface (GSI) pathway pursuant to Part 201, Environmental Remediation, and Part 213, Leaking Underground Storage Tanks, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA).

Several MDEQ divisions implement response activity and corrective action relying upon the cleanup criteria and process of Part 201. If there are questions of the documents' applicability to facilities subject to other environmental statutes, a person should consult with the appropriate MDEQ division staff.

Information regarding the application of Michigan surface water quality standards and options for compliance with the GSI pathway is available in MDEQ Groundwater-Surface Water Interface Pathway Compliance Options Reference Materials.

**DEFINITIONS:**

- GSI: Groundwater-Surface Water Interface that is the location at which groundwater enters a surface water body.
- GSI criteria: The water quality standards for surface waters developed by the MDEQ pursuant to Part 31.
- Mixing zone: A mixing zone is the portion of a surface water body in which venting groundwater is mixed with the receiving water.
- Part 31: Part 31, Water Resources Protection, of the NREPA

**INTRODUCTION:**

Compliance with the GSI pathway can be determined using mixing zone-based GSI criteria<sup>1</sup>. If generic GSI criteria are exceeded or reasonably expected to be exceeded at GSI monitoring

<sup>1</sup> A person may demonstrate compliance for a response activity or corrective action providing for venting groundwater by meeting mixing zone-based GSI criteria developed consistent with provisions of Part 31 [MCL 324.20120e(1)(c); MCL 324.21304a(5)(b)]. Part 31 allows for mixing zones for discharges of venting groundwater in the same manner as for point source discharges [MCL 324.3109a]. The Part 4 Water Quality Standards rules (Part 4 rules) in conjunction with the Part 8 Water Quality-Based Effluent Limit Development for Toxic Substances rules (Part 8 rules) establish the requirements and process for the development of mixing zone-based criteria to be used as cleanup criteria [R 323.1082, R 323.1201 to R 323.1221].

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points, a person may request the MDEQ to authorize a response activity or corrective action that relies on mixing zone-based criteria. A mixing zone is an allocated portion of the receiving surface water body where venting groundwater discharge is mixed with surface waters. The mixing zone is used to develop mixing zone-based GSI criteria.

For Part 213 corrective action, a request for calculation of mixing zone-based GSI criteria should be submitted to the MDEQ independent of and prior to the submittal of a Final Assessment Report (FAR) or Closure Report to allow the resulting criteria to be factored into the corrective action necessary to address the pathway. The request should be submitted with a Leaking Underground Storage Tank Supplemental Information Cover Sheet (Form [EQP 4001](#)). The request needs to contain or reference relevant portions of the initial assessment report that provide site information and site characterization results (including a conceptual site model) with sufficient detail to allow reasonable estimates of the discharge flow rate, appropriate contaminants of concern, and maximum concentrations of contaminants at the GSI to process a request for mixing zone-based GSI criteria. After the MDEQ transmits the calculated mixing zone-based GSI criteria, the criteria should be incorporated as part of the description of corrective action to be implemented in the Corrective Action Plan of a FAR, with a request for the MDEQ to authorize the discharge above generic GSI criteria. The FAR will need to provide sufficient information for the MDEQ to determine the adequacy of compliance monitoring plans when ongoing monitoring is necessary. There may be situations when no further monitoring of mixing zone-based GSI criteria is needed and submittal of a FAR is not necessary. In those circumstances, a Closure Report can demonstrate compliance with the mixing zone-based GSI criteria and request for the MDEQ to authorize the discharge of venting discharge above generic GSI criteria.

For Part 201 response activities, a request for calculation of mixing zone-based GSI criteria should be submitted to the MDEQ independent of and prior to a No Further Action Report. It may be advantageous to request calculation of mixing zone-based GSI criteria early in the remedy evaluation to allow the resulting criteria to be used as part of the compliance assessment of the pathway. The request for development of mixing zone-based criteria should be submitted as or included within a Response Activity Plan, using the Request for DEQ Review of Response Activity Plan (Form [EQP 4028](#)) unless otherwise required by an administrative order, order of agreement, or judicial decree<sup>2</sup>. The submittal must contain sufficient information from site investigation to allow reasonable estimates of the discharge flow rate, appropriate contaminants of concern and maximum concentrations of contaminants will need to be provided to process a request for mixing zone-based criteria. MDEQ authorization of the venting groundwater above generic GSI criteria will need sufficient information to determine the adequacy of compliance monitoring plans when ongoing monitoring is necessary in a Response Activity Plan or NFA Report.

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<sup>2</sup> A person shall proceed under Section 20114b of Part 201 to undertake response activities that use mixing zone-based GSI criteria. [MCL 324.20120e(7), MCL 324.20114b].

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## REQUEST FOR CALCULATION OF MIXING ZONE-BASED GSI CRITERIA

The Request for Mixing Zone-Based GSI Criteria (form [EQP4483](#))<sup>3</sup> is provided to assist in submittal of sufficient information for the MDEQ to develop mixing zone-based GSI criteria; the information may be provided in another format so long as information that addresses all of the following is submitted:

1. The name of the receiving surface water and the location where groundwater is venting.
  - a. A map or maps that illustrates the location of the facility, the location of the contaminant plume, and the receiving surface waters.
  - b. The GSI pathway exposure assumptions include unrestricted residential and recreational use of the receiving surface water consistent with Part 31 designated uses for surface water bodies. Any physical site conditions that would make these assumptions not applicable to site conditions should be provided.
2. The location, nature, and chemical characteristics of past and current sources of groundwater contamination<sup>4</sup>.
  - a. The basis for concluding that any hazardous substance released will not exceed generic GSI criteria at the GSI monitoring points.
  - b. Identification of hazardous substances that will or are likely to exceed generic GSI criteria at the GSI monitoring points, including the physical extent and range of concentrations.
  - c. Any location of mobile, migrating, or residual dense or light non-aqueous phase liquids in relation to GSI monitoring points.
3. The name, chemical abstract service (CAS) number, and concentration of the hazardous substances in the groundwater at the GSI monitoring points and upgradient of the interface that have a potential in the future to reach the GSI monitoring points above generic GSI criteria, and water quality characteristics.
  - a. To assure that mixing zone-based criteria are developed for all contaminants likely to exceed generic GSI criteria, maximum concentrations upgradient of the GSI monitoring points should be provided.
  - b. Any hazardous substance without established generic GSI criteria should be included.
  - c. Any existing water quality characteristic, such as pH, nutrients, dissolved oxygen, or physical characteristic should be included.
  - d. CAS numbers can be obtained from chemical dictionaries and the *National Institute of Occupational Safety and Health Pocket Guide to Chemical Hazards*.
  - e. Information from the site conceptual site model, including cross-sectional mapping of the contaminant plume, the location of monitoring wells and borings, elevation of each groundwater sampling location, contours for individual or groups of contaminants, and other relevant information should be included to assist in demonstrating the worst case maximum concentrations predicted to reach the GSI monitoring wells.

<sup>3</sup> This form contains no substantive changes since its original use in 1996.

<sup>4</sup> For this purpose, "sources of groundwater contamination" include environmental contamination.

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4. An estimate of the discharge rate<sup>5</sup>, in cubic feet per second, of that portion of the venting groundwater plume that exceeds, or is likely in the future to exceed, a generic GSI criterion.
- a. The plume discharge rate is estimated using Darcy's Law ( $Q_p = k \cdot i \cdot A$ ) where:
- $Q_p$  = Discharge rate, in cubic feet per second, of groundwater plume for the area contaminated above generic GSI criteria.
  - $k$  = A representative hydraulic conductivity within the area of plume discharge.
  - $i$  = A representative hydraulic gradient within the area of plume discharge.
  - $A$  = The cross-sectional area of the plume perpendicular to groundwater flow that encompasses the entire plume that exceeds the generic GSI.
- b. The hydraulic conductivity value ( $k$ ) should be obtained from properly designed and representative aquifer pumping tests (pumping tests). If rising and falling head tests (i.e., slug tests) are proposed in lieu of pumping tests as the means of determining hydraulic conductivity at a facility, documentation to demonstrate the results are representative for site conditions should be provided. Documentation should include an analyses of the test results that includes, as a minimum, information that addresses the following:
- Details of the procedures followed in the design, performance, and analysis phases of the test program and details of the design, construction, and development of the monitoring wells tested as well placement and effective well development are very important elements of a slug test program.
  - An evaluation to determine if the test results are reliable and within a range of values that are appropriate for the aquifer material types known to exist at the site.
  - How the number of tests and test locations are appropriate for effectively characterizing the site based upon the site conditions and size. The most conductive formation material should be included in the slug test program. Three or more rising and falling head tests of varying displacement values should be performed at each well location included in the slug testing program.
  - If the hydraulic conductivity values obtained from a slug testing program are not consistent with the values associated with the aquifer materials known to exist at the site, or if there is uncertainty regarding the quality of the slug test program, then an appropriately conservative multiplier (e.g., three to ten times) should be used to obtain a representative value. Documentation and justification to support the multiplier should be included.
- c. The hydraulic gradient ( $i$ ) used should not underestimate the gradient. The maximum hydraulic gradient observed at a site from several representative hydraulic gradient determinations should be used to calculate the discharge rate. In the event that seasonal variations occur, the highest hydraulic gradient should be used.
- d. The limits of the cross-sectional area ( $A$ ) extend to the nearest adjacent wells along the GSI in which groundwater concentrations are consistently below generic GSI

<sup>5</sup> The mixing zone-based criteria are calculated based upon the maximum discharge rate of venting groundwater [R 323.1209, Development of wasteload allocations for toxic substances, of the Part 8 rules].

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- criteria. The vertical extent must also be based upon wells with consistent concentrations below generic GSI criteria or on demonstrated geological constraints such as the top of the water table to a basal or confining clay layer. The assumption is that groundwater concentrations exceed generic GSI criteria within the defined areas.
5. If available, the location of other venting groundwater plumes in the vicinity of the facility in question, together with information about the names and concentrations of hazardous substances in those plumes.
    - a. Available information from the MDEQ Web site (see references for further information), or general knowledge should be used to identify locations of contaminated sites and possible locations of venting groundwater or point source discharges that may affect the mixing zone allocation. For a lake discharge, information regarding other discharges in the watershed vicinity should be included. For a stream discharge, information regarding other discharges in the vicinity of the receiving stream segment should be included.
  6. If the venting groundwater is a new or increased discharge to the surface waters of the state, then information to support an antidegradation demonstration or exemption, if one is required or allowed<sup>6</sup>.
    - a. Waters of the state that are currently better water quality than the water quality standards are not allowed to be degraded by a “new or increased loading” unless there is an “antidegradation demonstration.” The effective date of this provision is July 1997. The antidegradation demonstration applies to venting groundwater as a “new” loading. If the contaminant plume vented to surface waters prior to July 1997 and continues to vent it is considered an existing loading. A contaminant plume that began to vent after July 1997 is considered a new loading. If a contaminant plume has been intercepted through response activity and it is proposed to stop the response activity and allow the plume to vent, the discharge is considered a new loading. An increased loading is a contaminant plume in which the groundwater contaminant concentrations have or will substantially increase due to the migration of source area contamination, leaching of soil contaminants, or further migration of contaminated groundwater.
    - b. The venting groundwater may qualify for an exemption under the antidegradation provisions<sup>7</sup>. An explanation of why the exemption applies should be provided.
    - c. If an exemption does not apply, the demonstration must show the discharge is in the public interest based upon identified social or economic benefits to the area in which the new or increased loading will occur. Venting groundwater contamination frequently from Part 201 facilities or Part 213 sites is from historical practices; and there is no current operating presence to balance employment, production, or efficiencies with quantifiable additional costs of remediation. The demonstrations for these facilities has balanced the additional remediation costs to an increased use of the facility (e.g., redevelopment or other industrial, commercial, or residential growth) and other economic or social benefits to the community. Simply removing any perceived social stigma associated with the contaminated site to allow

<sup>6</sup> R 323.1098, Antidegradation, of the Part 4 rules.

<sup>7</sup> R 323.1098(8)(c)



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redevelopment has not been considered a social or economic benefit to justify allowing the increased loading.

The request for mixing zone-based GSI criteria (Form EQP4483) includes a certification statement that will need to be signed by an appropriate authorized party for Part 213 and Part 201 submittals. The authorized party for this request may be different than the person signing the Response Activity Plan or Supplemental Information Report.<sup>8</sup>

### **CALCULATION OF MIXING ZONE-BASED CRITERIA**

Upon receipt of sufficient information, the MDEQ will calculate mixing zone-based GSI criteria consistent with Section 3109a of Part 31 and the related rules promulgated under Part 31 and will provide the mixing zone-based GSI criteria to the requester.

Chronic mixing zone-based criteria are calculated based on dilution of the maximum discharge flow of venting groundwater and the allocated low flow value of the receiving surface waters. Low flow values for surface waters may be available from the MDEQ Web site (see references for further information).

Acute mixing zone-based criteria are calculated as maximum concentrations not to be exceeded at the GSI monitoring points in order to prevent harm to aquatic life. Dilution is not a factor in the calculation of acute criteria.

For certain chemicals and for stream segments with waste load allocations, the dilution afforded by the surface water body may be the limiting factor in determining mixing zone-based GSI criteria because the assimilative capacity of the stream segment has been reached for specific contaminants. A list of stream segments with waste load allocations and the specific contaminants affected is available from the MDEQ district offices.

Ambient concentrations in most Michigan surface waters exceed the applicable water quality standards for polychlorinated biphenyls (PCBs) and mercury, and mixing zone-based calculations for these bioaccumulative chemicals of concern (BCCs)<sup>9</sup> have not historically included dilution. Existing discharges of BCCs are no longer allowed mixing zones unless specific provisions<sup>10</sup> can be demonstrated. No mixing zone is available for new discharges of BCCs.

In some circumstances, chemical-specific criteria may not be protective of aquatic life due to the number or nature of toxic substances and/or unidentified substances found in the venting contaminant plume. Whole Effluent Toxicity testing of the groundwater contaminant plume at the GSI may be necessary to assess the toxicity of the groundwater. The MDEQ may specify requirements, including test methods, for such testing with the development of mixing zone-based criteria.

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<sup>8</sup> The request serves in lieu of a permit application [MCL 324.3109a] A permit application must be completed in accordance and subject to guidelines in 40 CFR §122.21 [R 323.2108(1)]; 40 CFR 122.22 designates authorized signatures.

<sup>9</sup> Table 5 of R 323.1057(8), Toxic substances, of the Part 4 rules

<sup>10</sup> R 323.1082(6)(c) or (d), Mixing zones of the Part 4 rules

REMEDATION AND REDEVELOPMENT DIVISION  
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The calculation of mixing zone-based GSI criteria alone does not constitute MDEQ authorization for the discharge of venting groundwater.

### **COMPLIANCE EVALUATION WITH MIXING ZONE-BASED GSI CRITERIA**

Compliance with mixing zone-based GSI criteria is demonstrated if there are no mixing zone-based GSI criteria exceedances in the GSI monitoring points, and no other water quality standards concerns, such as pH, nutrients, or dissolved oxygen or physical characteristics such as color, foam, sheen, taste or odor that require response activity.

Compliance with mixing zone-based GSI criteria that are based on chronic toxicity endpoints may be demonstrated by a statistical evaluation of the data of the plume area above generic GSI criteria<sup>11</sup>. The statistical evaluation may be based, if sufficient data are available, on a properly calculated and documented 95 percent upper confidence limit on the mean, or other appropriate statistical technique for data evaluation. Compliance with mixing zone-based GSI criteria that are based on acute toxicity must be demonstrated on a point-by-point basis.

### **ALTERNATIVE MIXING ZONE REQUESTS**

As a minimum restriction, the final acute value for aquatic life must not be exceeded when developing mixing zone-based criteria, unless the MDEQ determines or it is demonstrated to the MDEQ that a level higher is acceptable in accordance with the mixing zone rule provisions<sup>12</sup>. Acute mixing zones are allowed under specific mixing zone rule provisions.

Mixing zone-based criteria calculations can provide no greater than a tenfold dilution factor to groundwater venting to the Great Lakes or inland lakes<sup>13</sup> and cannot allocate more than 25 percent of the receiving surface water low flows in river systems<sup>14</sup> unless it can be demonstrated to the MDEQ that use of a larger volume is acceptable consistent with the mixing zone rule provisions.

To demonstrate to the MDEQ that an alternative mixing zone is acceptable, sufficient information must be submitted that addresses the mixing zone rule provisions. The Request for Mixing Zone-Based GSI Criteria (form EQP4483) information is not sufficient for this demonstration.

### **AUTHORIZATION OF VENTING GROUNDWATER**

The MDEQ may authorize a discharge of venting groundwater that does not meet generic GSI criteria (water quality standards) if a mixing zone has been allocated by the MDEQ<sup>15</sup>. The approval of the submittal requesting calculation of mixing zone-based GSI criteria and transmittal of the calculated criteria does not constitute MDEQ authorization for the discharge of venting groundwater. The MDEQ authorization of venting groundwater above generic GSI criteria is provided with the approval of FAR/CAP, Closure Report, Response Activity Plan, or

<sup>11</sup> Section 20120a(14) of Part 201

<sup>12</sup> R 323.1082(7)

<sup>13</sup> R 323.1082(5), Mixing zones of the Part 4 Rules

<sup>14</sup> R 323.1082(2) and R 323.1090, Applicability of water quality standards of the Part 4 rules

<sup>15</sup> R 323.1090

REMEDICATION AND REDEVELOPMENT DIVISION  
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NFA Report that proposes compliance for the GSI pathway. Public notice is necessary prior to approval of these documents.

The MDEQ authorization of venting groundwater above generic GSI criteria cannot be for a period longer than five years<sup>16</sup>. Whether a reauthorization requires additional information to be submitted to the MDEQ for review will be determined on a case-by-case basis, and the document providing the MDEQ authorization will establish any conditions for reauthorization. In all cases, the MDEQ will review the conditions used to develop the mixing zone-based GSI criteria including site information, the plume contaminants, and receiving waters flow conditions to assure that there have not been significant changes since the original authorization.

**REFERENCES:**

MDEQ Groundwater-Surface Water Interface Pathway Compliance Options Reference Materials

[Part 4. Water Quality Standards Rules](#)

The MDEQ Environmental Mapper has locational information for contaminated sites and is available from the MDEQ Web site:

The current link is: <http://web1.mcgi.state.mi.us/environmentalmapper/> or go to [www.Michigan.gov/deq](http://www.Michigan.gov/deq) | Land | Remediation | Program Information | Sites of Contamination | Environmental Mapper

Please note: do not save this web site as a favorite; frequent updates make reaccessing the web site necessary.

The MDEQ Low Flow Discharge Database is available from the MDEQ Web site:

The current link is: <http://www.deq.state.mi.us/flow/lflowqry.asp> or go to [www.Michigan.gov/deq](http://www.Michigan.gov/deq) | Water | Water Management | Hydrologic Data Collection & Analysis | Flood & Low Flow Discharge Reporting System | Low Flow Discharge Database

DIVISION DIRECTOR APPROVAL:

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Kathleen Shirey, Acting Director  
Remediation and Redevelopment Division

ENVIRONMENT DEPUTY DIRECTOR APPROVAL:

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Michael McClellan, Environment Deputy Director

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<sup>16</sup> R 323.2150, Duration of permits, of the Part 21 Wastewater Discharge Permits rules

REMEDATION AND REDEVELOPMENT DIVISION  
POLICY AND PROCEDURE

Number: RRD-33

Subject: Request for Calculation of Mixing Zone-Based  
Groundwater-Surface Water Interface Criteria

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NFA Report that proposes compliance for the GSI pathway. Public notice is necessary prior to approval of these documents.

The MDEQ authorization of venting groundwater above generic GSI criteria cannot be for a period longer than five years<sup>16</sup>. Whether a reauthorization requires additional information to be submitted to the MDEQ for review will be determined on a case-by-case basis, and the document providing the MDEQ authorization will establish any conditions for reauthorization. In all cases, the MDEQ will review the conditions used to develop the mixing zone-based GSI criteria including site information, the plume contaminants, and receiving waters flow conditions to assure that there have not been significant changes since the original authorization.

**REFERENCES:**

MDEQ Groundwater-Surface Water Interface Pathway Compliance Options Reference Materials

Part 4. Water Quality Standards Rules

The MDEQ Environmental Mapper has locational information for contaminated sites and is available from the MDEQ Web site:

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DIVISION DIRECTOR APPROVAL:



Kathleen Shirey, Acting Director  
Remediation and Redevelopment Division

ENVIRONMENT DEPUTY DIRECTOR APPROVAL:



Michael McClellan, Environment Deputy Director

<sup>16</sup> R 323.2150, Duration of permits, of the Part 21 Wastewater Discharge Permits rules

# *EXHIBIT J*

STATE OF MICHIGAN

IN THE CIRCUIT COURT FOR THE COUNTY OF WASHTENAW

ATTORNEY GENERAL FOR THE STATE OF  
MICHIGAN, *ex rel*, MICHIGAN DEPARTMENT  
OF NATURAL RESOURCES AND ENVIRONMENT,

Plaintiffs,

File No. 88-34734-CE

v

Honorable Donald E. Shelton

GELMAN SCIENCES, INC.,  
a Michigan corporation,

Defendant.

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Celeste R. Gill (P52484)  
Assistant Attorney General  
Environment, Natural Resources and  
Agriculture Division  
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Lansing, MI 48909  
(517) 373-7540  
Attorney for Plaintiffs

Michael L. Caldwell (P40554)  
Zausmer, Kaufman, August,  
Caldwell & Taylor, P.C.  
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Farmington Hills, MI 48334  
(248) 851-4111  
Attorney for Defendant

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**STIPULATED ORDER AMENDING PREVIOUS REMEDIATION ORDERS**

At a session of said Court, held in the County of Washtenaw  
City of Ann Arbor, State of Michigan, on \_\_\_\_\_

PRESENT: Hon. \_\_\_\_\_  
CIRCUIT COURT JUDGE

## RECITALS

A. A Consent Judgment was entered in this case on October 26, 1992. The Consent Judgment requires Defendant, Gelman Sciences, Inc., to implement various response activities to address environmental contamination in the vicinity of Defendant's property in Scio Township, subject to the approval of the Michigan Department of Natural Resources and Environment ("MDNRE"). The original Consent Judgment was amended by stipulation of the Plaintiffs and Defendant (collectively the "Parties) and Order of the Court on September 23, 1996 and October 20, 1999 (collectively the "Consent Judgment").

B. On November 15, 2010, counsel for the Parties presented the Court with a Notice of Tentative Agreement on Proposed Modifications to Remedial Objectives for Gelman Site ("Notice"), which described proposed changes that the parties had tentatively agreed to make to the remediation program for the Gelman Site.

C. During a hearing held on November 22, 2010, the Court instructed the parties to prepare an amendment to the October 26, 1992 Consent Judgment that was consistent with the proposed changes described in the Notice.

D. Contemporaneously with this Stipulated Order, the Parties are submitting the proposed Third Amendment to the Consent Judgment ("Third Amendment"), which memorializes the changes to the cleanup program described in the previously submitted Notice. By their signatures on the Third Amendment, the Parties stipulate and agree to its entry by the Court.

E. The Court has also supplemented the Consent Judgment with several cleanup related orders, based on information about the nature and extent of contamination acquired after the Consent Judgment and the Amendments were entered, including, Remediation and

Enforcement Order ("REO") dated July 17, 2000, the Opinion and order Regarding Remediation of the Contamination of the "Unit E" Aquifer ("Unit E Order"), dated December 17, 2004, and the Order Prohibiting Groundwater Use ("Prohibition Zone Order"), dated May 17, 2005.

F. Since entry of the REO and the Unit E Order, the parties have further refined their understanding of the nature and extent of contamination at the Gelman Site, which is reflected in the Third Amendment.

The Parties, through their legal counsel, stipulate and agree:

1. To the extent the Third Amendment is inconsistent with any of the requirements of the REO and/or the Unit E Order, the Third Amendment shall govern. In particular, the Third Amendment eliminates and supersedes the following remedial objectives of the REO and Unit E Order:

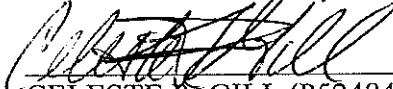
- a. The REO's requirement that Defendant maintain a combined purge rate for the Evergreen System extraction wells of at least 200 gpm.
- b. The REO's requirement that Defendant implement a plan to reduce the 1,4-dioxane in all affected water supplies below legally acceptable levels within five years.
- c. The Unit E Order's requirement that Defendant prevent, to the extent feasible, groundwater in the Unit E aquifer containing 1,4-dioxane in concentrations above 85 parts per billion (ug/l) from migrating east of Wagner Road.


2. The Court's Prohibition Zone Order will continue in force and is incorporated by reference by the Third Amendment and shall now apply to the "Expanded Prohibition Zone" as described in the Third Amendment, provided that the ability of the Parties under Paragraph 9 of



the Prohibition Zone Order to move the Court to alter the boundaries of the Prohibition Zone (and now Expanded Prohibition Zone) is modified as described in Section V.A.2.b. of the Third Amendment with regard to the northern boundaries.

APPROVED AS TO FORM AND SUBSTANCE:

  
\_\_\_\_\_  
CELESTE R. GILL (P52484)  
Attorney for Plaintiffs

  
\_\_\_\_\_  
MICHAEL L. CALDWELL (P40554)  
Attorney for Defendant

IT IS SO ORDERED.

\_\_\_\_\_  
CIRCUIT COURT JUDGE

LF/Gelman/88-34734-CE/Stip and Order Amending Previous Remediation Orders

# *EXHIBIT K*

DEPARTMENT OF ENVIRONMENTAL QUALITY  
REMEDIATION AND REDEVELOPMENT DIVISION  
ESTABLISHMENT OF CLEANUP CRITERIA FOR 1,4-DIOXANE  
**EMERGENCY RULES**

Filed with the Secretary of State on

These rules take effect upon filing with the Secretary of State and shall remain in effect for 6 months.

(By the authority conferred on the Department of Environmental Quality by 1994 PA 451, 1969 PA 306, MCL 324.20104(1), MCL 324.20120a(17), and MCL 24.248)

**FINDING OF EMERGENCY**

These rules are promulgated by the Department of Environmental Quality to establish cleanup criteria for 1,4-dioxane under the authority of Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. The Department of Environmental Quality finds that releases of 1,4-dioxane have occurred throughout Michigan that pose a threat to public health, safety, or welfare of its citizens and the environment. Recent shallow groundwater investigations in the Ann Arbor area have detected 1,4-dioxane in the groundwater in close proximity to residential homes. The known area of 1,4-dioxane groundwater contamination in Ann Arbor covers several square miles defined by a boundary of 85 parts per billion, the current residential cleanup criteria. The extent of 1,4-dioxane groundwater contamination that is less than 85 parts per billion, but greater than 7.2 parts per billion, is unknown; and 1,4-dioxane contamination is expected to be present beneath many square miles of the city of Ann Arbor occupied by residential dwellings. The current cleanup criteria for 1,4-dioxane, initially established in 2002, are outdated and are not protective of public health with respect to the drinking water ingestion pathway and the vapor intrusion pathway.

These rules establish the 1,4-dioxane cleanup criterion for the drinking water ingestion pathway at 7.2 parts per billion and the vapor intrusion screening criterion at 29 parts per billion. These criteria are calculated using the latest United States Environmental Protection Agency toxicity data for the chemical 1,4-dioxane and the Department of Environmental Quality's residential exposure algorithms to protect both children and adults from unsafe levels of the chemical.

The Department of Environmental Quality, therefore, finds that the current cleanup criteria for 1,4-dioxane are not protective of public health with respect to the drinking water ingestion pathway and the vapor intrusion pathway, which, therefore, requires

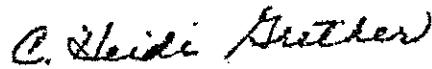
October 27, 2016

the promulgation of emergency rules without following the notice and participation procedures required by sections 41, 42, and 48 of 1969 PA 306, as amended, MCL 24.241, MCL 24.242, and MCL 24.248 of the Michigan Compiled Laws.

Rule 1. The residential drinking water cleanup criterion for 1,4-dioxane in groundwater is 7.2 parts per billion.

Rule 2. The residential vapor intrusion screening criterion for 1,4-dioxane is 29 parts per billion.


MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY



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C. Heidi Grether  
Director

Pursuant to Section 48(1) of 1969 PA 306, as amended, MCL 24.248(1), I hereby concur in the finding of the Department of Environmental Quality that circumstances creating an emergency have occurred and the public interest requires the promulgation of the above rule.



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Governor

10-27-16

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Date

# *EXHIBIT L*

STATE OF MICHIGAN

IN THE CIRCUIT COURT FOR THE COUNTY OF WASHTENAW

ATTORNEY GENERAL FOR THE STATE OF  
MICHIGAN *ex rel.* MICHIGAN DEPARTMENT  
OF ENVIRONMENT, GREAT LAKES, AND  
ENERGY,

Plaintiffs,

-v-

File No. 88-34734-CE  
Honorable Timothy P. Connors

GELMAN SCIENCES INC.,  
a Michigan Corporation,

Defendant.

---

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Attorney for Defendant

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FOURTH AMENDED AND RESTATED CONSENT JUDGMENT

The Parties enter this Fourth Amended and Restated Consent Judgment (“Consent Judgment” or “Fourth Amended Consent Judgment”) in recognition of, and with the intention of, furtherance of the public interest by (1) addressing environmental concerns raised in Plaintiffs’ Complaint; (2) expediting Remedial Action at the Site; and (3) avoiding further litigation concerning matters covered by this Consent Judgment. Among other things, the Parties enter this Consent Judgment to reflect EGLE’s revision of the generic state-wide residential and non-residential generic drinking water cleanup criteria for 1,4-dioxane in groundwater to 7.2 micrograms per liter (“ug/L”) and 350 ug/L, respectively, and of the generic groundwater-surface

water interface cleanup criterion for 1,4-dioxane in groundwater to 280 ug/L. The Parties agree to be bound by the terms of this Consent Judgment and stipulate to its entry by the Court.

The Parties recognize that this Consent Judgment is a compromise of disputed claims. By entering into this Consent Judgment, Defendant does not admit any of the allegations of the Complaint, does not admit any fault or liability under any statutory or common law, and does not waive any rights, claims, or defenses with respect to any person, including the State of Michigan, its agencies, and employees, except as otherwise provided herein. By entering into this Consent Judgment, Plaintiffs do not admit the validity or factual basis of any of the defenses asserted by Defendant, do not admit the validity of any factual or legal determinations previously made by the Court in this matter, and do not waive any rights with respect to any person, including Defendant, except as otherwise provided herein. The Parties agree, and the Court by entering this Consent Judgment finds, that the terms and conditions of the Consent Judgment are reasonable, adequately resolve the environmental issues covered by the Consent Judgment, and properly protect the public interest.

NOW, THEREFORE, upon the consent of the Parties, by their attorneys, it is hereby ORDERED and ADJUDGED:

**I. JURISDICTION**

A. This Court has jurisdiction over the subject matter of this action. This Court also has personal jurisdiction over the Defendant.

B. This Court shall retain jurisdiction over the Parties and the subject matter of this action to enforce this Consent Judgment and to resolve disputes arising under the Consent Judgment.

## **II. PARTIES BOUND**

This Consent Judgment applies to, is binding upon, and inures to the benefit of Plaintiffs, Defendant, and their successors and assigns.

## **III. DEFINITIONS**

Whenever the terms listed below are used in this Consent Judgment or the Attachments that are appended hereto, the following definitions shall apply:

A. “Consent Judgment” or “Fourth Amended Consent Judgment” shall mean this Fourth Amended and Restated Consent Judgment and all Attachments appended hereto. All Attachments to this Consent Judgment are incorporated herein and made enforceable parts of this Consent Judgment.

B. “Day” shall mean a calendar day unless expressly stated to be a working day. “Working Day” shall mean a day other than a Saturday, Sunday, or a State legal holiday. In computing any period of time under this Consent Judgment, where the last day would fall on a Saturday, Sunday, or State legal holiday, the period shall run until the end of the next working day.

C. “Defendant” shall mean Gelman Sciences Inc.

D. “1,4-dioxane” shall mean 1,4-dioxane released to or migrating from the Gelman Property. This term as it is used in this Consent Judgment shall not include any 1,4-dioxane that Defendant establishes by a preponderance of the evidence to have originated from a release for which Defendant is not legally responsible, except to the extent that such 1,4-dioxane is commingled with 1,4-dioxane released to or migrating from the Gelman Property. Nothing in this Consent Judgment shall preclude Defendant’s right to seek contribution or cost recovery from other parties responsible for such commingled 1,4-dioxane.



E. “Eastern Area” shall mean the part of the Site that is located east of Wagner Road, including the areas encompassed by the Prohibition Zone.

F. “EGLE” shall mean the Michigan Department of Environment, Great Lakes, and Energy, the successor to the Michigan Department of Environmental Quality, the Michigan Department of Natural Resources and Environment, the Michigan Department of Natural Resources, and the Water Resources Commission. Pursuant to Executive Order 2019-06, effective April 22, 2019, the Michigan Department of Environmental Quality was renamed the Michigan Department of Environment, Great Lakes, and Energy.

G. “Evergreen Subdivision Area” shall mean the residential subdivision generally located north of I-94 and between Wagner and Maple Roads, bounded on the west by Rose Street, on the north by Dexter Road, and on the south and east by Valley Drive.

H. “Gelman” shall mean Gelman Sciences Inc.

I. “Gelman Property” shall mean the real property described in Attachment A, where Defendant formerly operated a manufacturing facility in Scio Township, Michigan. The Defendant sold portions of the property and retains one parcel only for purposes of operating a water treatment system (the “Wagner Road Treatment Facility”).

J. “Generic GSI Criterion” shall mean the generic groundwater-surface water interface (“GSI”) cleanup criterion for 1,4-dioxane of 280 ug/L established pursuant to MCL 324.20120e(1)(a).

K. “Groundwater Contamination” shall mean the 1,4-dioxane in the groundwater at a concentration in excess of 7.2 ug/L, as determined by the analytical method(s) described in Attachment B to this Consent Judgment, subject to review and approval by EGLE.

L. “Municipal Water Connection Contingency Plan” or “MWCCP” shall mean a

contingency plan developed to identify the steps necessary to connect properties that rely on a private drinking water well to municipal water in the event those wells are threatened by 1,4-dioxane concentrations in excess of the applicable drinking water cleanup criterion and the estimated time necessary to implement each step of the water connection process.

M. “Part 201” shall mean Part 201 of the Natural Resources and Environmental Protection Act, MCL 324.20101, *et seq.*

N. “Parties” shall mean Plaintiffs and Defendant.

O. “Plaintiffs” shall mean the Attorney General of the State of Michigan *ex rel.*

EGLE.

P. “Prohibition Zone” or “PZ” shall mean the area that is subject to the institutional control established by the Prohibition Zone Order and this Consent Judgment. A map depicting the Prohibition Zone established by this Fourth Amended Consent Judgment is attached as Attachment C.

Q. “Prohibition Zone Order” shall collectively mean the Court’s Order Prohibiting Groundwater Use, dated May 17, 2005, which established a judicial institutional control, and the March 8, 2011 Stipulated Order Amending Previous Remediation Orders, which incorporated the Prohibition Zone Order into this Consent Judgment and applied the institutional control to the Expanded Prohibition Zone, as defined in the Third Amendment to Consent Judgment.

R. “PZ Boundary Wells” shall mean those wells on or near the boundary of the Prohibition Zone and designated in Section V.A.3.b herein, whose purpose is to detect movement of 1,4-dioxane near the Prohibition Zone boundary.

S. “Remedial Action” or “Remediation” shall mean removal, treatment, and proper disposal of Groundwater and Soil Contamination, land use or resource restrictions, and

institutional controls, pursuant to the terms and conditions of this Consent Judgment and work plans approved by EGLE under this Consent Judgment.

T. “Response Activity” or “Response Activities” shall have the same meaning as that term is defined in Part 201, MCL 324.20101(vv).

U. “Sentinel Wells” shall mean those wells designated in Section V.A.3.a herein, whose purpose is to detect movement of 1,4-dioxane toward the Prohibition Zone boundary.

V. “Site” shall mean the Gelman Property and other areas affected by the migration of 1,4-dioxane emanating from the Gelman Property.

W. “Soil Contamination” or “Soil Contaminant” shall mean 1,4-dioxane in soil at a concentration in excess of 500 micrograms per kilogram (“ug/kg”), as determined by the analytical method(s) described in Attachment D or another higher concentration limit derived by means consistent with Mich Admin Code R 299.18 or MCL 324.20120a.

X. “Verification Process” shall mean the process through which Defendant shall test for and verify concentrations of 1,4-dioxane in excess of the applicable threshold at the relevant monitoring and drinking water wells, using the sampling and analytical method(s) described in Attachment B to this Consent Judgment. Specifically, Defendant shall sample the wells on a quarterly basis unless an alternative schedule is agreed upon with EGLE. Groundwater samples will be analyzed for 1,4-dioxane, either by Defendant’s laboratory or a third-party laboratory retained by Defendant. In the event that 1,4-dioxane concentrations in groundwater sampled from any well exceed the applicable threshold, Defendant shall notify EGLE by phone or electronic mail within 48 hours of completion of the data verification and validation specified in the Quality Assurance Project Plan (“QAPP”) described in Section V.E. Defendant will resample the same well within five days after the data verification and validation of the original

result or at a time agreed upon with EGLE, if EGLE opts to take split samples. If a second sample analyzed by Defendant's laboratory or a third-party laboratory retained by Defendant has contaminant concentrations exceeding the applicable threshold, the exceedance will be considered verified and Defendant shall undertake the required Response Activities.

In the event that EGLE opts to take split samples, Defendant shall also collect an additional split sample for potential analysis within the applicable holding time by a mutually agreed-upon third-party laboratory at Defendant's expense. If the results from one sample, but not both, confirm a verified exceedance, the third sample analyzed by the mutually agreed-upon third-party laboratory, using the sampling and analytical method(s) described in Attachment B to this Consent Judgment, shall serve as the relevant result for verification purposes.

Y. "Western Area" shall mean that part of the Site located west of Wagner Road.

#### **IV. IMPLEMENTATION OF REMEDIAL ACTION BY DEFENDANT**

Defendant shall implement the Remedial Action to address Groundwater and Soil Contamination at, and emanating from, the Gelman Property in accordance with (1) the terms and conditions of this Consent Judgment; and (2) work plans approved by EGLE pursuant to this Consent Judgment. Notwithstanding any requirements set forth in this Consent Judgment obligating Defendant to operate remedial systems on a continuous basis, at a minimum rate, or until certain circumstances occur, Defendant may temporarily reduce or shut-down such remedial systems for reasonably necessary maintenance according to EGLE-approved operation and maintenance plans.

#### **V. GROUNDWATER REMEDIATION**

Defendant shall design, install, operate, and maintain the systems described below to satisfy the objectives described below. Defendant also shall implement a monitoring program to

verify the effectiveness of these systems.

A. Eastern Area

1. Objectives. The remedial objectives of the Eastern Area (“Eastern Area Objectives”) shall be the following:

a. Prohibition Zone Containment Objective. Defendant shall prevent Groundwater Contamination, regardless of the aquifer designation or the depth of the groundwater or Groundwater Contamination, from migrating beyond the boundaries of the Prohibition Zone as may be amended pursuant to Section V.A.2.f. Compliance with the Prohibition Zone Containment Objective shall be determined as provided in Section V.A.4.b, below.

b. Groundwater-Surface Water Interface Objective. Defendant shall prevent 1,4-dioxane from venting into surface waters in the Eastern Area at concentrations above the Generic GSI Cleanup Criterion, except in compliance with Part 201, including MCL 324.20120e (“Groundwater-Surface Water Interface Objective” for the Eastern Area).

2. Prohibition Zone Institutional Control. Pursuant to MCL 324.20121(8) and the Prohibition Zone Order, the following land and resource use restrictions shall apply to the Prohibition Zone depicted on the map attached hereto as Attachment C:

a. The installation by any person of a new water supply well in the Prohibition Zone for drinking, irrigation, commercial, or industrial use is prohibited.

b. The Washtenaw County Health Officer or any other entity authorized to issue well construction permits shall not issue a well construction permit for any well in the Prohibition Zone.

c. The consumption or use by any person of groundwater from the

Prohibition Zone is prohibited.

d. The prohibitions listed in Subsections V.A.2.a–c do not apply to the installation and use of:

i. Groundwater extraction and monitoring wells as part of Response Activities approved by EGLE or otherwise authorized under Parts 201 or 213 of the Natural Resources and Environmental Protection Act (“NREPA”), or other legal authority;

ii. Dewatering wells for lawful construction or maintenance activities, provided that appropriate measures are taken to prevent unacceptable human or environmental exposures to hazardous substances and comply with MCL 324.20107a;

iii. Wells supplying heat pump systems that either operate in a closed loop system or if not, are demonstrated to operate in a manner sufficient to prevent unacceptable human or environmental exposures to hazardous substances and comply with MCL 324.20107a;

iv. Emergency measures necessary to protect public health, safety, welfare or the environment;

v. Any existing water supply well that has been demonstrated, on a case-by-case basis and with the written approval of EGLE, to draw water from a formation that is not likely to become contaminated with 1,4-dioxane emanating from the Gelman Property. Such wells shall be monitored for 1,4-dioxane by Defendant at a frequency determined by EGLE; and

vi. The City of Ann Arbor’s Northwest Supply Well, provided that the City of Ann Arbor operates the Northwest Supply Well in a manner that does not prevent

its municipal water supply system from complying with all applicable state and federal laws and regulations.

e. Attachment E (consisting of the map depicting the Prohibition Zone and the above list of prohibitions/exceptions) shall be published and maintained in the same manner as a zoning ordinance at Defendant's sole expense, which may be accomplished by the City of Ann Arbor maintaining a hyperlink on its public webpage that includes the City of Ann Arbor zoning maps, or another appropriate webpage, that directs the visitor to the portion of EGLE's Gelman Sciences website that identifies the extent of the Prohibition Zone and the Summary of Restrictions. EGLE-approved legal notice of the Prohibition Zone expansion reflected in Attachment F shall be provided at Defendant's sole expense.

f. The Prohibition Zone Institutional Control shall remain in effect in this form until such time as it is modified through amendment of this Consent Judgment, with a minimum of 30 days' prior notice to all Parties. The Defendant or EGLE may move to amend this Consent Judgment to modify the boundaries of the Prohibition Zone to reflect material changes in the boundaries or fate and transport of the Groundwater Contamination as determined by future hydrogeological investigations or EGLE-approved monitoring of the fate and transport of the Groundwater Contamination. The dispute resolution procedures of Section XVI shall not apply to such motion. Rather, the Prohibition Zone boundary may not be expanded unless the moving Party demonstrates by clear and convincing evidence that there are compelling reasons that the proposed expansion is needed to prevent an unacceptable risk to human health. The above-described showing shall not apply to a motion if the Prohibition Zone expansion being sought arises from or is related to: (1) inclusion of the Triangle Property under the following subsection; (2) the incorporation of a more restrictive definition of Groundwater Contamination

(i.e., a criterion less than 7.2 ug/L) into this Consent Judgment; or (3) expansion under V.A.6.c up to and including back to the boundary established by this Fourth Amended Consent Judgment.

g. Future Inclusion of Triangle Property in the Prohibition Zone. The triangular piece of property located along Dexter Road/M-14 (“Triangle Property”), depicted in Attachment C, will be included in the Prohibition Zone if the data obtained from monitoring wells MW-121s and MW-121d and other nearby wells, including any water supply well installed on the property, as validated by the Verification Process, indicate that the Groundwater Contamination has migrated to the Triangle Property.

h. Well Identification. To identify any wells newly included in the Prohibition Zone as a result of this modification or any future modification to the Prohibition Zone, pursuant to an EGLE-approved schedule, Defendant shall implement a well identification plan for the affected area that is consistent with the Expanded Prohibition Zone Well Identification Work Plan approved by EGLE on February 4, 2011.

i. Plugging of Private Water Wells. Defendant shall plug and replace any private drinking water wells identified in any areas newly included in the Prohibition Zone by connecting those properties to the municipal water supply. Unless otherwise approved by EGLE, Defendant shall also properly plug non-drinking water wells in any areas newly included in the Prohibition Zone.

j. Municipal Water Connection Contingency Plan (“MWCCP”). Defendant shall develop a MWCCP addressing the potential provision of municipal water to properties using private drinking water wells in the Calvin Street, Wagner Road, and Lakeview Avenue areas. The MWCCP will be developed according to a schedule to be approved by



EGLE.

3. Monitoring and Extraction Well Installation and Operation. Defendant shall install the following additional wells in the Eastern Area according to a schedule approved by EGLE and subject to access and receipt of any required approvals pursuant to Section VII.D:

a. Sentinel Well Installation. Defendant shall install the following three monitoring well clusters to monitor movement of 1,4-dioxane south of the northern Prohibition Zone boundary, in addition to MW-120, MW-123, and MW-129 that are already in place (collectively referred to herein as “Sentinel Wells”):

- i. Residential area in the general vicinity of Ravenwood and Barber Avenues (Location “A” on map attached as Attachment G);
- ii. Residential area in the general vicinity of Sequoia Parkway and Archwood Avenues between Delwood and Center (Location “B” on map attached as Attachment G); and
- iii. Residential area in the general vicinity of Maple Road and North Circle Drive (Location “C” on the map attached as Attachment G).

b. PZ Boundary Well Installation. Defendant shall install the following two monitoring well clusters to monitor the movement of 1,4-dioxane near the PZ Boundary (collectively referred to herein as “PZ Boundary Wells”):

- i. Residential, commercial, and vacant area east of South Wagner Road, north of West Liberty Road, west of Lakeview Avenue, and south of Second Sister Lake (Location “D” on map attached as Attachment G); and
- ii. Residential area south/southeast of the MW-112 cluster (Location “E” on map attached as Attachment G).

c. Sentinel and PZ Boundary Well Installation and Sampling. Defendant shall install the new well clusters according to a schedule to be approved by EGLE. Each new Sentinel or PZ Boundary Well cluster will include two to three monitoring wells, and

the determination of the number of wells shall be based on EGLE's and the Defendant's evaluation of the geologic conditions present at each location, consistent with past practice. The frequency of sampling these monitoring wells and the analytical methodology for sample analysis will be included in the Eastern Area System Monitoring Plan, as amended.

d. Drilling Techniques. Borings for new wells installed pursuant to Section V.A.3 shall be drilled to bedrock unless a different depth is approved by EGLE or if conditions make such installation impracticable. EGLE reserves the right to require alternate drilling techniques to reach bedrock if standard methods are not able to do so. If the Defendant believes that drilling one or more of these wells to bedrock is not practical due to the geologic conditions encountered and/or that such conditions do not warrant the alternative drilling technique required by EGLE, Defendant may initiate dispute resolution under Section XVI of this Consent Judgment. The wells shall be installed using Defendant's current vertical profiling techniques, which are designed to minimize the amount of water introduced during drilling, unless EGLE agrees to alternate techniques. Any material excavated as the result of well installation shall be properly characterized and disposed of or transferred to an appropriate facility for preservation and future scientific investigation, at Defendant's discretion.

e. Installation of Additional Groundwater Extraction Wells.

i. Defendant shall install an additional groundwater extraction well (the "Rose Well") and associated infrastructure in the general area bounded by Rose Street and Pinewood Street as designated on Attachment G or convert former injection well IW-2 to a groundwater extraction well, or both. The decision to install the Rose Well or to convert IW-2 to an extraction well (or to do both) and exact location of the Rose Well if installed will be based on an evaluation of relevant geologic conditions, water quality, and other relevant factors,

including access.

ii. Subject to V.A.3.g., below, Defendant shall install an additional groundwater extraction well (the “Parklake Well”) and associated infrastructure in the parcel owned by the City of Ann Arbor bounded by Parklake Avenue and Jackson Road as designated on Attachment G (the “City of Ann Arbor-owned parcel”). The exact location of the Parklake Well within the City of Ann Arbor-owned parcel will be based on an evaluation of relevant geologic conditions, water quality, and other relevant factors, including access. Terms of access to the City of Ann Arbor-owned parcel shall be governed by an access or license agreement between Defendant and the City of Ann Arbor and Defendant’s obligation to install and operate the Parklake Well shall be conditioned on negotiation of a mutually acceptable agreement with the City of Ann Arbor.

f. Eastern Area Groundwater Extraction.

i. The Defendant shall operate the Evergreen Subdivision Area extraction wells, LB-4 and either the Rose Well or IW-2, or both (including EGLE-approved replacement well(s)) (collectively, the “Evergreen Wells”), and TW-19 and TW-23 (or EGLE-approved replacement well(s)) (the “Maple Road Wells”), at a combined minimum purge rate of approximately 200 gallons per minute (“gpm”) or the maximum capacity of the existing deep transmission pipeline, whichever is less provided Defendant properly maintains the pipeline, in order to reduce the mass of 1,4-dioxane migrating through the Evergreen Subdivision Area and the mass of 1,4-dioxane migrating east of Maple Road, until such time as the Eastern Area Objectives will be met at a reduced extraction rate or without the need to operate these extraction wells. In the event the maximum capacity of the existing deep transmission pipeline is ever reduced to below 180 gpm, Defendant shall repair and/or reconfigure the pipeline and

related infrastructure, or take other action, including potentially replacing the pipeline or treating and disposing of some portion of the extracted groundwater at a different location, as needed to once again achieve a capacity of 190 – 200 gpm. Defendant shall have the discretion to adjust the individual well purge rates in order to optimize mass removal and compliance with the Eastern Area Objectives, provided that it shall operate the Evergreen Wells at a combined minimum purge rate of approximately 100 gpm, until such time as the Eastern Area Objectives will be met at a reduced extraction rate without the need to operate these wells. Before significantly reducing extraction below the minimum purge rates described above or permanently terminating extraction from either the Evergreen Wells or the Maple Road Wells, Defendant shall consult with EGLE and provide a written analysis, together with the data that supports its conclusion that the Eastern Area Objectives can be met at a reduced extraction rate or without the need to operate these extraction wells. EGLE will review the analysis and data and provide a written response to Defendant within 56 days after receiving Defendant’s written analysis and data. If Defendant disagrees with the EGLE’s conclusion, Defendant may initiate dispute resolution under Section XVI of this Consent Judgment. The Defendant shall not significantly reduce or terminate extraction from the Evergreen Wells or the Maple Road Wells during the 56-day review period or while Defendant is disputing EGLE’s conclusion.

ii. Defendant shall operate the Parklake Well, at a purge rate of approximately 200 gpm, subject to the yield of the aquifer in that area and discharge volume restrictions imposed in connection with the method of water disposal including discharge restrictions during wet weather events, in order to reduce the mass of 1,4-dioxane migrating from that area. Purged groundwater from the Parklake Well shall be treated with ozone/hydrogen peroxide or ultraviolet light and oxidizing agents at the City of Ann Arbor-owned parcel.

Defendant shall operate this extraction and treatment system until the 1,4-dioxane concentration in the groundwater extracted from the Parklake Well has been reduced below 500 ug/L. Once concentrations have been reduced below 500 ug/L, Defendant shall cycle the Parklake Well off and on for several periods of time approved by EGLE to demonstrate that significant concentration rebound is not occurring. Defendant shall not permanently terminate extraction and treatment of water from the Parklake Well before the second anniversary of the date extraction was commenced. Before significantly reducing or terminating extraction from the Parklake Well (beyond the discharge volume restrictions/variations arising from the approved discharge option/above-described cycling), Defendant shall consult with EGLE and provide a written analysis, together with the data that supports its conclusion that the foregoing conditions have been satisfied. EGLE will review the analysis and data and provide a written response to Defendant within 56 days after receiving Defendant's written analysis and data. If Defendant disagrees with EGLE's conclusion, Defendant may initiate dispute resolution under Section XVI of this Consent Judgment. The Defendant shall not significantly reduce or terminate extraction from the Parklake Well during the 56-day review period or while Defendant is disputing EGLE's conclusion.

g. Prerequisites for Parklake Well. Notwithstanding anything else in this Consent Judgment, Defendant shall not be obligated to install and operate the Parklake Well unless and until EGLE issues Defendant an NPDES permit with effluent limitations, discharge limits (other than volume) and other conditions no more restrictive than those included in Defendant's NPDES Permit No. MI-0048453 dated October 1, 2014 ("2014 NPDES Permit") that authorizes discharge of groundwater extracted by the Parklake Well to First Sister Lake following treatment with ozone/hydrogen peroxide technology .

4. Verification Monitoring. Defendant shall amend its Eastern Area System Monitoring Plan dated December 22, 2011 to include the monitoring wells installed under Section V.A.3 within 60 days of their installation. The Eastern Area System Monitoring Plan, as amended (hereinafter the “Verification Plan”), shall be sufficient to meet the objectives of this Section.

a. Objectives of Verification Plan. The Verification Plan shall include the collection of data sufficient to measure the effectiveness of the Remediation and to:

- (i) ensure that any potential migration of Groundwater Contamination outside of the Prohibition Zone is detected before such migration occurs and with sufficient time to allow Defendant to maintain compliance with the Prohibition Zone Containment Objective;
- (ii) verify that the Groundwater-Surface Water Interface Objective is satisfied;
- (iii) track the migration of the Groundwater Contamination to determine the need for additional investigation and monitoring points to meet the objectives in Section V.A.1, including the determination of the fate and transport of Groundwater Contamination when and if it reaches the Allen Creek Drain (including its branches) and the portion of the Huron River that is the easternmost extent of the Prohibition Zone; and
- (iv) evaluate potential changes in groundwater flow resulting from adjustments in extraction rates at different extraction well locations.

The Verification Plan shall be continued until terminated pursuant to Section V.D.

b. Compliance Determination. The Verification Plan shall include the following steps for verifying sampling results and confirming compliance or noncompliance with the Eastern Area Objectives.

i. Verification Process for Sentinel Wells. Defendant shall conduct the Verification Process as defined in Section III.X for each Sentinel Well to verify any

exceedance of 7.2 ug/L. A verified detection above 7.2 ug/L will be considered a “Verified Sentinel Well Exceedance” and Defendant shall take the Response Activities set forth in Section V.A.5.a.

ii. Verification Process for PZ Boundary Wells. Defendant shall conduct the Verification Process as defined in Section III.X for each PZ Boundary Well to verify any exceedance of 4.6 ug/L and/or 7.2 ug/L. A verified detection above 4.6 ug/L will be considered a “Verified PZ Boundary Well Exceedance” and Defendant shall take the Response Activities set forth in Section V.5.b. A verified detection above 7.2 ug/L will be considered a “Confirmed PZ Boundary Well Noncompliance” and Defendant shall take the Response Activities set forth in Section V.5.c.

5. Eastern Area Response Activities. Defendant shall take the following Response Activities:

a. Verified Sentinel Well Exceedance. In the event of a Verified Sentinel Well Exceedance, Defendant shall sample that Sentinel Well monthly. If the concentrations of 1,4-dioxane are less than 7.2 ug/L in samples from any two successive monthly sampling events, Defendant shall return to sampling that Sentinel Well quarterly. If, however, the concentrations of 1,4-dioxane exceed 7.2 ug/L in samples collected from the same Sentinel Well in any three successive monthly sampling events, Defendant shall take the following actions:

i. If involving a Sentinel Well in the north, installation of up to two additional well clusters near the Prohibition Zone boundary (the location of which shall be determined based on the location of the initial exceedance). If more than one Sentinel Well in the north exceeds the trigger level, Defendant and EGLE will mutually agree on the number of

PZ Boundary Wells to be installed. Defendant shall sample the new PZ Boundary Wells monthly until Defendant completes the hydrogeological assessment described in Section V.A.5.a.ii below.

ii. Completion of a focused hydrogeological assessment of the applicable area that analyzes the likelihood that 1,4-dioxane at levels above 7.2 ug/L will migrate outside the Prohibition Zone. The assessment shall also opine on the mechanism causing the exceedances and the potential risk of impact to private drinking water wells. Defendant shall provide this assessment to EGLE within 60 days after installation of the new PZ Boundary Well(s). If the focused hydrogeological assessment determines that there is a low potential for the Groundwater Contamination to migrate beyond the Prohibition Zone boundary, normal quarterly monitoring of the Sentinel Well and applicable PZ Boundary Wells will resume. If the focused hydrogeological assessment determines that there is a reasonable likelihood for 1,4-dioxane greater than 7.2 ug/L to migrate beyond the Prohibition Zone boundary, the Defendant shall initiate the following Response Activities:

(A) Defendant shall continue to monitor the affected Sentinel Well(s) and the Prohibition Zone Boundary Wells on a monthly basis.

(B) If the Verified Sentinel Well Exceedance occurs in a Sentinel Well to be installed near the northern boundary of the Prohibition Zone, Defendant shall develop a “Remedial Contingency Plan” that identifies the Response Activities that could be implemented to prevent Groundwater Contamination from migrating beyond the Prohibition Zone Boundary. The Remedial Contingency Plan may identify expansion of the Prohibition Zone as an option, subject to Section V.A.2.f. Defendant shall submit the Remedial Contingency Plan to EGLE within 45 days after the focused hydrogeological assessment is completed.



(C) Defendant will review the Municipal Water Connection Contingency Plan, if applicable, and initiate preliminary activities related to provision of municipal water to potentially impacted private drinking water wells. The amount of work to be completed will be based on the anticipated time frame for water extension and the projected time of migration to potential receptors.

b. Verified PZ Boundary Well Exceedance. In the event of a Verified PZ Boundary Well Exceedance, Defendant shall sample that PZ Boundary Well monthly. If the concentrations of 1,4-dioxane are less than 4.6 ug/L in samples from any two successive monthly sampling events, Defendant shall return to sampling that PZ Boundary Well quarterly. If, however, the concentrations of 1,4-dioxane exceed 4.6 ug/L in samples collected from the same PZ Boundary Well in any three successive monthly sampling events, Defendant shall take the following actions:

i. Defendant, in consultation with EGLE, shall sample select private drinking water wells in the immediate vicinity of the impacted PZ Boundary Well.

ii. Defendant will review the Municipal Water Connection Contingency Plan, and initiate further activities related to potential provision of municipal water to potentially impacted private drinking water wells as appropriate. The amount of work to be completed will be based on the anticipated time frames for water extension and the projected time of migration to potential receptors.

iii. Subject to Section V.A.2.f, Defendant shall implement the Remedial Contingency Plan as necessary to prevent contaminant levels above 7.2 ug/L from migrating beyond the Prohibition Zone Boundary.

c. Confirmed PZ Boundary Well Noncompliance. In the event of a

Confirmed PZ Boundary Well Noncompliance, Defendant shall sample that PZ Boundary Well monthly. If the concentrations of 1,4-dioxane are less than 7.2 ug/L in samples from any two successive monthly sampling events, Defendant shall return to sampling that PZ Boundary Well quarterly. If, however, the concentrations of 1,4-dioxane exceed 7.2 ug/L in samples collected from the same PZ Boundary Well in any four successive monthly sampling events, Defendant shall take the following actions:

i. Defendant shall sample any active drinking water wells in the immediate vicinity of the impacted PZ Boundary Well on a monthly basis.

ii. Defendant will review the Municipal Water Connection Contingency Plan and implement the remaining activities necessary to provide municipal water to properties serviced by private drinking water wells potentially impacted by 1,4-dioxane concentrations above the applicable drinking water cleanup criterion.

iii. Defendant shall connect any such properties to municipal water on a case-by-case basis as determined by EGLE or if requested by the property owner.

iv. Subject to Section V.A.2.f, Defendant shall undertake Response Actions as necessary to reduce concentrations in the affected PZ Boundary Well(s) to less than 7.2 ug/L.

d. Bottled Water. At any time, Defendant shall supply the occupants of any property with a threatened drinking water well with bottled water if, prior to connection to municipal water, 1,4-dioxane concentrations in the drinking water well servicing the property exceed 3.0 ug/L. This obligation shall terminate if either (i) the 1,4-dioxane concentration in the well drops below 3.0 ug/L during two consecutive sampling events or (ii) the property is connected to an alternative water supply.

e. Triangle Property. If a drinking water well is installed on the Triangle Property in the future, Defendant shall take the necessary steps to obtain permission to sample the well on a schedule approved by EGLE. Defendant shall monitor such well(s) on EGLE-approved schedule unless or until that property is included in the Prohibition Zone, at which time, any water well(s) shall be addressed as part of the well identification process described in Section V.A.2.h.

f. Downgradient Investigation. The Defendant shall continue to implement its Downgradient Investigation Work Plan as approved by EGLE on February 4, 2005, as may be amended, to track the Groundwater Contamination as it migrates to ensure any potential migration of Groundwater Contamination outside of the Prohibition Zone is detected before such migration occurs with sufficient time to allow Defendant to maintain compliance with the Prohibition Zone Containment Objective and to ensure compliance with the Groundwater-Surface Water Interface Objective. Defendant shall, as the next phase of this iterative investigation process investigate the area depicted on the map attached as Attachment G, including the installation of monitoring wells at the following locations subject to access and receipt of any required approvals pursuant to Section VII.D:

- i. A monitoring well nest in the residential area in the general vicinity of intersection of Washington and 7<sup>th</sup> Streets (Location “F” on Attachment G);
- iii. A shallow well in the residential area in the general vicinity of current monitoring well nest MW-98 (Location “G” on Attachment G); and
- iv. A monitoring well nest in the residential area in the general vicinity of Brierwood and Linwood Streets (Location “H” on Attachment G).

The data from these wells will be used to guide additional downgradient investigations as necessary to ensure compliance with the Eastern Area Objectives.

6. Prohibition Zone Boundary Review.

a. Five years after entry of this Fourth Amended Consent Judgment and then every five years thereafter, Defendant and EGLE shall confer and determine whether the boundary of the Prohibition Zone can be contracted without either: (i) posing a current or future risk to the public health and welfare, including maintaining an adequate distance between the Groundwater Contamination and the Prohibition Zone boundary; or (ii) requiring Defendant to undertake additional Response Activities to contain the Groundwater Contamination within the contracted Prohibition Zone boundary beyond those Response Activities otherwise required immediately before the proposed contraction. This determination will be based on consideration of the totality of all data from existing Eastern Area monitoring wells.

b. If EGLE and Defendant jointly agree that the Prohibition Zone boundary may be contracted under these conditions, the Parties shall move to amend Attachments C and E of this Consent Judgment for the sole purpose of establishing a revised boundary for the Prohibition Zone. If only one Party concludes that the Prohibition Zone boundary may be contracted under these conditions, that Party may move to amend Attachments C and E of this Consent Judgment for the sole purpose of establishing a revised boundary for the Prohibition Zone, but must demonstrate by clear and convincing evidence that the above conditions are satisfied. The non-moving Party may oppose or otherwise respond to such motion and the showing required under Section XVI shall not apply to the Court's resolution of the motion.

c. If the Prohibition Zone boundary is contracted under Section V.A.6 and the Parties, either jointly or independently, subsequently determine that based on the totality of the data, the Prohibition Zone boundary should be expanded up to and including back

to the boundary established by this Fourth Amended Consent Judgment in order to protect the public health and welfare, the Party(ies) may move to amend Attachments C and E of this Consent Judgment for the sole purpose of establishing a revised boundary for the Prohibition Zone. Neither Section XVI nor the showing required under Section V.A.2.f shall apply to the Court's resolution of the motion, provided that the expansion sought does not extend beyond the boundary established by this Fourth Amended Consent Judgment.

d. To the extent the Prohibition Zone boundary is contracted under Section V.A.6.a, Defendant shall not be required to undertake Response Activities to contain the Groundwater Contamination within the contracted boundary beyond those Response Activities required immediately before the Prohibition Zone was contracted.

7. Operation and Maintenance. Subject to Sections V.A.3.f, V.A.9, and reasonably necessary maintenance according to EGLE-approved operation and maintenance plans, Defendant shall operate and maintain the Eastern Area System as necessary to meet the Prohibition Zone Containment Objective until Defendant is authorized to terminate extraction well operations pursuant to Section V.C.1.

8. Treatment and Disposal. Groundwater extracted by the extraction well(s) in the Eastern Area System shall be treated (as necessary depending on the disposal method(s) utilized) with ozone/hydrogen peroxide or ultraviolet light and oxidizing agent(s), or such other method approved by EGLE to reduce 1,4-dioxane concentrations to the required level and disposed of using methods approved by EGLE, including, but not limited to, the following options:

a. Groundwater Discharge. The purged groundwater shall be treated to reduce 1,4-dioxane concentrations to the level required by EGLE, and discharged to

groundwater at locations approved by EGLE in compliance with a permit or exemption authorizing such discharge.

b. Sanitary Sewer Discharge. Use of the sanitary sewer leading to the Ann Arbor Wastewater Treatment Plant is conditioned upon approval of the City of Ann Arbor. If discharge is made to the sanitary sewer, the Evergreen and Maple Road Wells shall be operated and monitored in compliance with the terms and conditions of an Industrial User's Permit from the City of Ann Arbor, and any subsequent written amendment of that permit made by the City of Ann Arbor. The terms and conditions of any such permit and any subsequent amendment shall be directly enforceable by EGLE against Defendant as requirements of this Consent Judgment.

c. Storm Sewer Discharge. Use of the storm drain or sewer is conditioned upon issuance of an NPDES permit and approval of the appropriate regulatory authority(ies). Discharge to the Huron River via a storm water system shall be in accordance with the relevant NPDES permit and conditions required by the relevant regulatory authority(ies). If a storm drain or sewer is to be used for disposal of purged groundwater, Defendant shall submit to EGLE and the appropriate local regulatory authority(ies) for their review and approval, a protocol under which the purge system shall be temporarily shut down: (i) for maintenance of the storm drain or sewer and (ii) during storm events to assure that the storm water system retains adequate capacity to handle run-off created during such events. Defendant shall not be permitted or be under any obligation under this subsection to discharge purged groundwater to the storm drain or sewer unless the protocol for temporary shutdown is approved by all necessary authorities. Following approval of the protocol, the purge system shall be operated in accordance with the approved protocol.

d. Existing or Additional/Replacement Pipeline to Wagner Road Treatment Facility.

i. The existing deep transmission pipeline, an additional pipeline, or a pipeline replacing the existing deep transmission pipeline may be used to convey purged groundwater from the existing Evergreen Area infrastructure to the Wagner Road Treatment Facility where the purged groundwater shall be treated to reduce 1,4-dioxane concentrations to the level required by NPDES Permit No. MI-0048453, as amended or reissued.

ii. Installation of an additional pipeline or a replacement pipeline from the existing Evergreen Area to the Wagner Road Treatment Facility is conditioned upon approval of such installation by EGLE. If the pipeline is proposed to be installed on public property, the pipeline installation is conditioned upon approval of such installation by the appropriate local authority(ies), if required by statute or ordinance, or by Order of the Court pursuant to the authority under MCL 324.20135a. Defendant shall design and install the pipeline in compliance with all state requirements and install the pipeline with monitoring devices to detect any leaks. If leaks are detected, the system will automatically shut down and notify an operator of the condition. In the event that any leakage is detected, Defendant shall take any measures necessary to repair any leaks and perform any remediation that may be necessary. To reduce the possibility of accidental damage to the pipeline during any future construction, Defendant shall participate in the notification system provided by MISS DIG Systems, Inc., or its successor (“MISS DIG”), and shall comply with the provisions of MCL 460.721, *et seq.*, as may be amended and with the regulations promulgated thereunder. Defendant shall properly mark its facilities upon notice from MISS DIG.

e. Existing, Replacement, or Additional Pipeline from Maple Road

Extraction Well(s). Defendant may operate the existing pipeline or install and operate a replacement pipeline or an additional pipeline from the Maple Road Extraction Well(s) to the existing Evergreen area infrastructure to convey groundwater extracted from the Maple Road Extraction Wells to the Wagner Road Treatment Facility, where the purged groundwater shall be treated to reduce 1,4-dioxane concentrations to the level required by NPDES Permit No. MI-0048453, as amended or reissued. Installation and operation of an additional or replacement pipeline from the Maple Road area to Evergreen area is conditioned upon approval of such installation and operation by EGLE. If the pipeline is proposed to be installed on public property, the pipeline installation is conditioned upon approval of such installation by the appropriate local authorities, if required by statute or ordinance, or Order of the Court pursuant to the authority under MCL 324.20135a. Defendant shall design any such pipeline in compliance with all state requirements and install it with monitoring devices to detect any leaks. In the event any leakage is detected, Defendant shall take any measures necessary to repair any leaks and perform any remediation that may be necessary. To reduce the possibility of accidental damage to the pipeline, Defendant shall participate in the notification system provided by MISS DIG and shall comply with the provisions of MCL 460.721, *et seq.*, as may be amended, and with the regulations promulgated thereunder. Defendant shall properly mark its facilities upon notice from MISS DIG.

f. Pipeline from Rose Well. Installation and operation of a proposed pipeline from the Rose Well to the existing Evergreen area infrastructure is conditioned upon approval of such installation and operation by EGLE. If the pipeline is proposed to be installed on public property, the pipeline installation is conditioned upon approval of such installation by the appropriate local authorities, if required by statute or ordinance, or Order of the Court



pursuant to the authority under MCL 324.20135a. Defendant shall design and install any such pipeline in compliance with all state requirements and install it with monitoring devices to detect any leaks. In the event any leakage is detected, Defendant shall take any measures necessary to repair any leaks and perform any remediation that may be necessary. To reduce the possibility of accidental damage to the pipeline, Defendant shall participate in the notification system provided by MISS DIG and shall comply with the provisions of MCL 460.721, *et seq.*, as may be amended, and with the regulations promulgated thereunder. Defendant shall properly mark its facilities upon notice from MISS DIG. Defendant may operate such pipeline to, among other things, convey groundwater extracted from the Rose Well to the existing Evergreen Area infrastructure and then to the Wagner Road Treatment Facility, where the purged groundwater shall be treated to reduce 1,4-dioxane concentrations to the level required by NPDES Permit No. MI-0048453, as amended or reissued.

g. Surface Water Discharge to First Sister Lake. Groundwater extracted from the Parklake Well may be discharged to First Sister Lake, conditioned on EGLE's issuance of an NPDES permit with effluent limitations, discharge limits (other than volume), and other conditions no more restrictive than those included in Defendant's 2014 NPDES Permit that authorizes discharge of groundwater to First Sister Lake following treatment with ozone/hydrogen peroxide technology. Defendant shall submit a protocol to EGLE and the appropriate local authority(ies) for their review and approval, a protocol under which the Parklake Well shall be temporarily shut down during storm events or high water levels in First Sister Lake as necessary to avoid flooding. Defendant shall not be under any obligation to operate the Parklake Well unless the protocol for temporary shutdown is approved by all necessary authorities. Following approval of the protocol, Defendant shall operate the Parklake

Well in accordance with the approved protocol.

9. Wagner Road Extraction. The extraction wells currently or in the future located just west of Wagner Road (the “Wagner Road Wells”) shall be considered part of the Eastern Area System even though they are located west of Wagner Road. The Defendant shall initially operate the Wagner Road Wells at a combined 200 gpm extraction rate. The Defendant shall continue to operate the Wagner Road Wells in order to reduce the migration of 1,4-dioxane east of Wagner Road at this rate until such time as the Eastern Area Objectives will be met with a lower combined extraction rate or without the need to operate these wells or that reduction of the Wagner Road extraction rate would enhance 1,4-dioxane mass removal from the Parklake Well and/or the Rose Well/IW-2 and Defendant’s efforts to reduce the mass of 1,4-dioxane migrating east of Maple Road and/or through the Evergreen Subdivision Area. Before significantly reducing or terminating extraction from the Wagner Road Wells, Defendant shall consult with EGLE and provide a written analysis, together with the data that supports its conclusion that the above-objectives can be met at a reduced extraction rate or without the need to operate these extraction wells. EGLE will review the analysis and data and provide a written response to Defendants within 56 days after receiving Defendant’s written analysis and data. If Defendant disagrees with EGLE’s conclusion, Defendant may initiate dispute resolution under Section XVI of this Consent Judgment. The Defendant shall not significantly reduce or terminate the Wagner Road extraction during the 56-day review period or while Defendant is disputing EGLE’s conclusion.

10. Options Array for Transmission Line Failure/Inadequate Capacity. The Defendant has provided EGLE with documentation regarding the life expectancy of the deep transmission line and an Options Array (attached as Attachment H). The Options Array

describes the various options that may be available if the deep transmission line fails or the 200 gpm capacity of the existing deep transmission line that transports groundwater from the Eastern Area System to the treatment system located on the Gelman Property proves to be insufficient to meet the Prohibition Zone Containment Objective.

B. Western Area

1. Western Area Non-Expansion Cleanup Objective. The Defendant shall prevent the horizontal extent of the Groundwater Contamination in the Western Area, regardless of the depth (as established under Section V.B.3.b and c), from expanding. Compliance with this objective shall be determined as set forth in Section V.B.4, below. Continued migration of Groundwater Contamination into the Prohibition Zone, as may be modified, shall not be considered expansion and is allowed. A change in the horizontal extent of Groundwater Contamination resulting solely from the Court's application of a new cleanup criterion shall not constitute expansion. Nothing in this Section prohibits EGLE from seeking additional response activities pursuant to Section XVIII.E of this Consent Judgment. Compliance with the Non-Expansion Cleanup Objective shall be established and verified by the network of monitoring wells in the Western Area to be selected and/or installed by the Defendant as provided in Sections V.B.3.b and c, below ("Western Area Compliance Well Network") and the Compliance Process set forth in Section V.B.4 ("Western Area Compliance Process"). Except as provided in Section VI.C.1, there is no independent mass removal requirement or a requirement that Defendant operate any particular Western Area extraction well(s) at any particular rate beyond what is necessary to prevent the prohibited expansion, provided that Defendant's ability to terminate all groundwater extraction in the Western Area is subject to Section V.C.1.c and the establishment of property use restrictions as required by Section V.B.3.a. If prohibited

expansion occurs, as determined by the Western Area Compliance Well Network and the Western Area Compliance Process, Defendant shall undertake additional response activities to return the Groundwater Contamination to the boundary established by the Western Area Compliance Well Network (such response activities may include groundwater extraction at particular locations).

As part of the Third Amendment to Consent Judgment, EGLE agreed to modify the remedial objective for the Western Area as provided herein to a no expansion performance objective in reliance on Defendant's agreement to comply with a no expansion performance objective for the Western Area. To ensure compliance with this objective, Defendant acknowledges that in addition to taking further response action to return the horizontal extent of Groundwater Contamination to the boundary established by the Compliance Well Network, Defendant shall be subject to stipulated penalties for violation of the objective as provided in Section XVII. Nothing in this Section shall limit Defendant's ability to contest the assessment of such stipulated penalties as provided in this Consent Judgment.

2. Western Area Groundwater-Surface Water Interface Objective.

a. Defendant shall prevent 1,4-dioxane from venting into surface waters in the Western Area at concentrations above the Generic GSI Cleanup Criterion, except in compliance with Part 201, including MCL 324.20120e ("Groundwater-Surface Water Interface Objective" for the Western Area).

b. GSI Investigation Work Plan. Within 90 days of entry of this Consent Judgment, Defendant shall submit to EGLE for its review and approval a work plan for investigation of the groundwater-surface water interface in the Western Area and a schedule for implementing the work plan. Defendant's work plan shall include:

i. An evaluation of the Western Area and identification of any areas where the GSI pathway is relevant, i.e., any areas where 1,4-dioxane in groundwater is reasonably expected to vent to surface water in concentrations that exceed the Generic GSI Criterion based on evaluation of the factors listed in MCL 324.20120e(3); and

ii. A description of the Response Activities Defendant will take to determine whether 1,4-dioxane in groundwater is venting to surface water in any such areas in concentrations that exceed the Generic GSI Criterion.

c. GSI Response Activity Work Plan. With respect to any areas where the above-described GSI investigation demonstrates that 1,4-dioxane in groundwater is venting to surface water in any such areas in concentrations that exceed the Generic GSI Criterion, Defendant shall submit for EGLE review and approval a work plan and a schedule for implementing the work plan that describes the Response Activities, including any evaluations under MCL 324.20120e, Defendant will undertake to ensure compliance with Groundwater-Surface Water Interface Objective within a reasonable timeframe.

d. Compliance with Groundwater-Surface Water Interface Objective. Defendant shall undertake such Response Activities and/or evaluations as necessary to achieve compliance with the Groundwater-Surface Water Interface Objective. It shall not be a violation of this Consent Judgment nor shall Defendant be subject to stipulated penalties unless and until Defendant fails to achieve compliance with the Groundwater-Surface Water Interface Objective within a reasonable timeframe established by EGLE and then only from that point forward. EGLE's determination of a reasonable timeframe for compliance with the Groundwater-Surface Water Interface Objective is subject to dispute resolution under Section XVI.

3. Western Area Response Activities. Defendant shall implement the

following response activities:

a. Groundwater Extraction. The Western Area Response Activities shall include the operation of groundwater extraction wells as necessary to meet the objectives described in Section V.B.1 and 2, including operation of the Marshy Area groundwater extraction system described in Defendant's May 5, 2000 Final Design and Effectiveness Monitoring Plan, as subsequently modified and approved by EGLE. Defendant shall also install and operate additional groundwater extraction wells at the Gelman Property as described in Section VI, below, in order to reduce the mass of 1,4-dioxane in the groundwater. Purged groundwater from the Western Area shall be treated with ozone/hydrogen peroxide or ultraviolet light and oxidizing agent(s), or such other method approved by EGLE to reduce 1,4-dioxane concentrations to the level required by NPDES Permit No. MI-0048453, as amended or reissued. Discharge to the Honey Creek tributary shall be in accordance with NPDES Permit No. MI-0048453, as amended or reissued. The Defendant shall have property use restrictions that are sufficient to prevent unacceptable exposures in place for any properties affected by Soil Contamination or Groundwater Contamination before completely terminating extraction in the Western Area.

b. Western Area Delineation Investigation. Defendant shall install the following additional groundwater monitoring wells pursuant to a schedule approved by EGLE and subject to the accessibility of the locations and obtaining access and any required approvals under Section VII.D at the approximate locations described below and on the map attached as Attachment G to address gaps in the current definition of the Groundwater Contamination and to further define the horizontal extent of Groundwater Contamination in the Western Area:

- i. Commercial area north of Jackson Road (across from April Drive) and south of US-Highway I-94, near MW-40s&d. (Deep well only) (Location “I” on Attachment G);
- ii. Commercial area north of Jackson Road (across from Nancy Drive) and south of US-Highway I-94, east of MW-40s&d and west of the MW-133 cluster (Location “J” on Attachment G);
- iii. Residential area west of West Delhi, north of Jackson Road and south of US-Highway I-94 (Location “K” on Attachment G);
- iv. Residential area southwest of the MW-141 cluster in the vicinity of Kilkenny and Birkdale (Location “L” on Attachment G);
- v. Residential area along Myrtle between Jackson Road and Park Road (Shallow Well only) (Location “M” on Attachment G); and
- vi. Residential and vacant area within approximately 250 feet of Honey Creek southwest of Dexter Road (Location “N” on Attachment G).

This investigation may be amended by agreement of EGLE and the Defendant to reflect data obtained during the investigation. Defendant shall promptly provide the data/results from the investigation to EGLE so that EGLE receives them prior to Defendant’s submission of the Compliance Monitoring Plan described in Subsection V.B.3.c, below. Based on the data obtained from the wells described above, Defendant may propose to install additional monitoring wells to potentially serve as Compliance Wells rather than one or more of the wells identified above. EGLE reserves the right to request the installation of additional borings/monitoring wells, if the totality of the data indicate that the horizontal extent of Groundwater Contamination has not been completely defined.

c. Compliance Well Network and Compliance Monitoring Plan.

Within 30 days of completing the investigation described in Subsection V.B.3.b, above, Defendant shall amend its Western Area Monitoring Plan dated April 18, 2011, including Defendant’s analysis of the data obtained during the investigation for review and approval by

EGLE, to identify the network of compliance wells that will be used to confirm compliance with the Western Area Non-Expansion Cleanup Objective (hereinafter referred to as the “Compliance Monitoring Plan”). The Compliance Monitoring Plan shall include the collection of data from a compliance well network sufficient to verify the effectiveness of the Western Area System in meeting the Western Area Non-Expansion Cleanup Objective. The locations and/or number of the Compliance Wells for the Compliance Monitoring Plan will be determined based on the data obtained from the investigation Defendant shall conduct pursuant to Section V.B.3.b, and shall be made up of existing monitoring wells. EGLE shall approve the Compliance Monitoring Plan, submit to Defendant changes in the Compliance Monitoring Plan that would result in approval, or deny the Compliance Monitoring Plan within 35 days of receiving the Compliance Monitoring Plan. Defendant shall either implement the EGLE-approved Compliance Monitoring Plan, including any changes required by EGLE, or initiate dispute resolution pursuant to Section XVI of this Consent Judgment. Defendant shall implement the EGLE- (or Court)-approved Compliance Monitoring Plan to verify the effectiveness of the Western Area System in meeting the Western Area Non-Expansion Cleanup Objective. Defendant shall continue to implement the current EGLE-approved monitoring plan(s) until EGLE approves the Compliance Monitoring Plan required by this Section. The monitoring program shall be continued until terminated pursuant to Section V.D.

d. Municipal Water Connection Contingency Plan (“MWCCP”).

Defendant shall develop a MWCCP addressing the potential provision of township water to properties using private drinking water wells on Elizabeth Road. The MWCCP will be developed according to a schedule to be approved by EGLE.



4. Compliance Determination for Non-Expansion Objective. The Compliance Monitoring Plan shall include the following steps for verifying sampling results and confirming compliance or noncompliance with the Western Area Non-Expansion Cleanup Objective.

a. Monitoring Frequency/Analytical Method. Defendant will sample groundwater from the Compliance Wells on a quarterly basis unless an alternative schedule is agreed upon with EGLE. Groundwater samples will be submitted to a laboratory owned, operated or contracted by Defendant for 1,4-dioxane analysis.

b. Verification Process. Defendant shall conduct the Verification Process as defined in Section III.X for each Compliance Well to verify any exceedance of 7.2 ug/L. A verified detection above 7.2 ug/L will be considered a “Verified Compliance Well Exceedance.” If a second sample does not exceed 7.2 ug/L, monitoring of the well will increase to monthly until the pattern of exceedances is broken by two successive sampling events below 7.2 ug/L. At that point, a quarterly monitoring frequency will resume.

c. Response Activities. In the event of a Verified Compliance Well Exceedance, Defendant shall take the following Response Activities:

i. Sample selected nearby private drinking water wells. Defendant shall sample select private drinking water wells unless otherwise the Parties otherwise agree. Prior to sampling the selected wells, Defendant shall submit a list of the wells to be sampled and other sampling details to EGLE for approval. In selecting wells to be sampled, Defendant shall consider data collected from monitoring and private drinking water wells within 1,000 feet of the Compliance Well(s) that exceeded 7.2 ug/L, groundwater flow, hydrogeology and well depth. EGLE shall respond within seven days after receipt of Defendant’s list of select

private drinking water wells and shall either approve the list or propose alternate or additional wells to be sampled.

ii. If a Verified Compliance Well Exceedance occurs in the same Compliance Well in any two successive monthly sampling events, Defendant shall take the following Response Activities:

(A) Continue to sample the previously selected private drinking water well(s) on a monthly basis unless otherwise agreed upon with EGLE.

(B) Conduct focused hydrogeological investigation to determine whether the Verified Compliance Well Exceedance is a temporary fluctuation or evidence of plume expansion. The investigation shall include the measurement of groundwater levels in relevant monitoring wells in the vicinity of the Compliance Well with the Verified Compliance Well Exceedance. Defendant shall report its findings to EGLE within 30 days of completing the hydrogeological investigation.

(C) Conduct Statistical Analysis. During the eight month period after the second consecutive Verified Compliance Well Exceedance, Defendant shall complete a statistical analysis of the data using a Mann-Kendall Trend Test or other statistical technique approved by EGLE.

(D) Interim Measures Feasibility Study. During the eight month period after the second consecutive Verified Compliance Well Exceedance, Defendant shall evaluate affirmative measures to control expansion of the Groundwater Contamination as necessary to reduce the concentration of 1,4-dioxane in the relevant Compliance Well to below 7.2 ug/L, including adjustments in groundwater extraction rates, the installation of additional groundwater extraction wells or other remedial technologies.

Defendant shall submit to EGLE a feasibility study within 240 days of the Verified Compliance Well Exceedance. The feasibility study shall include an evaluation of the feasibility and effectiveness of all applicable measures to control expansion of the Groundwater Contamination as necessary to reduce the concentration of 1,4-dioxane in the relevant Compliance Well to below 7.2 ug/L in light of the geology and current understanding of the fate and transport of the Groundwater Contamination.

iii. If, after conducting the focused hydrogeological investigation and statistical analysis, the totality of the data evidences a reasonable likelihood that the Western Area Non-Expansion Cleanup Objective is not being met, Defendant shall evaluate and, subject to EGLE approval, implement one or more of the potential response activities identified in the feasibility study, or other response activities, as necessary to achieve compliance with the Western Area Non-Expansion Cleanup Objective. Nothing in this Section shall prevent Defendant from implementing response activities as necessary to achieve the Western Area Non-Expansion Cleanup Objective at an earlier time.

d. Stipulated Penalties/Exacerbation. Defendant shall not be subject to stipulated penalties until concentrations in at least four consecutive monthly samples from a given Compliance Well exceed 7.2 ug/L, at which point Defendant shall be subject to stipulated penalties for violation of the Western Area Non-Expansion Cleanup Objective as provided in Section XVII, provided, however, that Defendant shall not be subject to stipulated penalties with respect to prohibited expansion of the horizontal extent of the Groundwater Contamination if Defendant can demonstrate by a preponderance of the evidence that the migration of the Groundwater Contamination is caused in whole or in part by the actions of an unrelated third party that have contributed to or exacerbated the Groundwater Contamination. In such event,

although Defendant is not subject to stipulated penalties, Defendant shall remain responsible for mitigating the migration of the Groundwater Contamination. Nothing in this Consent Judgment shall preclude Defendant from seeking contribution or cost recovery from other parties responsible for or contributing to exacerbation of the Groundwater Contamination.

e. Private Drinking Water Well Response Activities. If, after conducting the focused hydrogeological investigation and statistical analysis, the totality of the data evidences a reasonable likelihood that 1,4-dioxane will be present at concentrations above 7.2 ug/L in a residential drinking water well and/or at concentrations above 350 ug/L in an active non-residential drinking water well, Defendant shall evaluate and, if appropriate, implement response activities, including, without limitation, the following:

i. Sampling of at risk drinking water well(s) on a monthly basis;

ii. Implementation of affirmative interim measures to mitigate the expansion of 1,4-dioxane at concentrations above the applicable drinking water standard toward the drinking water well(s) as determined in the feasibility study described in Section V.B.4.c.ii.(D);

iii. Evaluation of land use restrictions and/or institutional controls to eliminate drinking water exposures to 1,4-dioxane in the groundwater at concentrations above the applicable drinking water standard; and

iv. Evaluation of water supply alternatives including, but not limited to, providing bottled water, a township water connection, installation of a new drinking water well completed in an uncontaminated portion of the subsurface, and point-of-use treatment systems.

v. If at any time 1,4-dioxane is detected in an active private drinking water well above 3.0 ug/L, Defendant shall promptly at its expense, offer the occupants of the property the option of receiving bottled water and shall sample the well monthly. These obligations shall terminate if either (i) the 1,4-dioxane concentration in the well drops below 3.0 ug/L during two consecutive sampling events or (ii) the property is connected to a permanent alternative water supply. Furthermore, Defendant shall work with EGLE and municipal authorities to evaluate long-term and economically reasonable water supply options.

vi. If 1,4-dioxane is detected at concentrations above 7.2 ug/L in an active residential drinking water well and/or at concentrations above 350 ug/L in an active non-residential drinking water well, Defendant shall conduct the Verification Process as defined in Section III.X for each such private drinking water well. If the detection above 7.2 ug/L is verified, Defendant shall monitor each such private drinking water well on a monthly basis if not already doing so and shall continue monthly monitoring until the well is no longer considered at risk under Section V.B.4.e.i. If 1,4-dioxane is detected at concentrations above 7.2 ug/L in four consecutive monthly samples or any seven monthly samples in any 12 month period, Defendant shall provide at its expense a long-term alternative water supply to the property serviced by the affected well. Such long-term alternative water supply may be in the form of a township water connection, installation of a new drinking water well completed in an uncontaminated portion of the subsurface, or a point-of-use treatment system, or other long-term drinking water supply option approved by EGLE. Defendant shall also provide at its expense bottled water to the property owner until the property is serviced by a long-term alternative water supply.

5. Groundwater Contamination Delineation. Additional delineation of the extent of Groundwater Contamination, including within the plume boundary, and/or

characterization of source areas shall not be required except as provided in Section V.B.3.c.

EGLE reserves the right to petition the Court to require additional work if there are findings that EGLE determines warrant additional Groundwater Contamination delineation.

C. Termination of Groundwater Extraction Systems

1. Defendant may only terminate the Groundwater Extraction Systems listed below as provided below:

a. Termination Criteria for Evergreen Wells/Maple Road

Wells/Wagner Road Wells. Except as otherwise provided pursuant to Section V.C.2, Defendant may only reduce (below the stated minimum purge rates) or terminate operation of the Evergreen Wells/Maple Road Wells as provided in Section V.A.3.f.i. and of the Wagner Road Wells as provided in Section V.A.9.

b. Termination Criteria for Parklake Well. Except as otherwise

provided pursuant to Section V.C.2, Defendant may reduce or terminate operation of the Parklake Well as provided in Section V.A.3.f.ii.

c. Termination Criteria for Western Area. Defendant may terminate

the groundwater extraction described in Section VI.C.1 as provided in that Section. Except as otherwise provided pursuant to Section V.C.2, and subject to Section V.B.1., Defendant shall not terminate all groundwater extraction in the Western Area until all of the following are established:

i. Defendant can establish to EGLE's satisfaction that

groundwater extraction is no longer necessary to prevent the expansion of Groundwater Contamination prohibited under Section V.B.1;

ii. Defendant's demonstration shall also establish that

groundwater extraction is no longer necessary to satisfy the Groundwater-Surface Water Interface Objective under Section V.B.2; and

iii. Defendant has the land use or resource use restrictions described in Section V.B.3.a in place.

Defendant's request to terminate extraction in the Western Area must be made in writing for review and approval pursuant to Section X of this Consent Judgment. The request must include all supporting documentation demonstrating compliance with the termination criteria. Defendant may initiate dispute resolution pursuant to Section XVI of this Consent Judgment if EGLE does not approve the Defendant's request/demonstration. Defendant may terminate Western Area groundwater extraction upon: (i) receipt of notice of approval from EGLE; or (ii) receipt of notice of a final decision approving termination pursuant to dispute resolution procedures of Section XVI of this Consent Judgment.

2. Modification of Termination Criteria/Cleanup Criteria. The termination criteria provided in Section V.C.1. and/or the definition of "Groundwater Contamination" or "Soil Contamination" may be modified as follows:

a. After entry of this Fourth Amended Consent Judgment, Defendant may propose to EGLE that the termination criteria be modified based upon either or both of the following:

i. a change in legally applicable or relevant and appropriate regulatory criteria since the entry of this Fourth Amended Consent Judgment; for purposes for this Subsection, "regulatory criteria" shall mean any promulgated standard criterion or limitation under federal or state environmental law specifically applicable to 1,4-dioxane; or

ii. scientific evidence newly released since the date of the

United States Environmental Protection Agency's IRIS risk assessment for 1,4-dioxane (August 11, 2010), which, in combination with the existing scientific evidence, establishes that different termination criteria/definitions for 1,4-dioxane are appropriate and will assure protection of public health, safety, welfare, the environment, and natural resources.

b. Defendant shall submit any such proposal in writing, together with supporting documentation, to EGLE for review.

c. If the Defendant and EGLE agree to a proposed modification, the agreement shall be made by written Stipulation filed with the Court pursuant to Section XXIV of this Consent Judgment.

d. If EGLE disapproves the proposed modification, Defendant may invoke the dispute resolution procedures contained in Section XVI of this Consent Judgment. Alternatively, if EGLE disapproves a proposed modification, Defendant may seek to have the dispute resolved pursuant to Subsection V.C.3.

3. If the Defendant invokes the procedures of this Subsection, Defendant and EGLE shall prepare a list of the items of difference to be submitted to a scientific advisory panel for review and recommendations. The scientific advisory panel shall be comprised of three persons with scientific expertise in the discipline(s) relevant to the items of difference. No member of the panel may be a person who has been employed or retained by either Party, except persons compensated solely for providing peer review of the Hartung Report, in connection with the subject of this litigation.

a. If this procedure is invoked, each Party shall, within 14 days, select one member of the panel. Those two members of the panel shall select the third member. Defendant shall, within 28 days after this procedure is invoked, establish a fund of at least



\$10,000.00, from which each member of the panel shall be paid reasonable compensation for their services, including actual and necessary expenses. If EGLE and Defendant do not agree concerning the qualifications, eligibility, or compensation of panel members, they may invoke the dispute resolution procedures contained in Section XVI of this Consent Judgment.

b. Within a reasonable period of time after selection of all panel members, the panel shall confer and establish a schedule for acceptance of submissions from EGLE and the Defendant completing review and making recommendations on the items of difference.

c. The scientific advisory panel shall make its recommendations concerning resolution of the items of difference to EGLE and the Defendant. If both EGLE and Defendant accept those recommendations, the termination criteria shall be modified in accordance with such recommendations. If EGLE and the Defendant disagree with the recommendations, EGLE's proposed resolution of the dispute shall be final unless Defendant invokes the procedures for judicial dispute resolution as provided in Section XVI of this Consent Judgment. The recommendation of the scientific advisory panel and any related documents shall be submitted to the Court as part of the record to be considered by the Court in resolving the dispute.

D. Post-Termination Monitoring

1. Eastern Area

a. Prohibition Zone Containment Objective. Except as otherwise provided pursuant to Section V.C.2, Defendant shall continue to monitor the Groundwater Contamination as it migrates within the Prohibition Zone until all approved monitoring wells are below 7.2 ug/L or such other applicable criterion for 1,4-dioxane for six consecutive months, or

Defendant can establish to EGLE's satisfaction that continued monitoring is not necessary to satisfy the Prohibition Zone Containment Objective. Defendant's request to terminate monitoring must be made in writing for review and approval pursuant to Section X of this Consent Judgment. Defendant may initiate dispute resolution pursuant to Section XVI of this Consent Judgment if EGLE does not approve its termination request.

b. Groundwater-Surface Water Interface Objective. Except as provided in Section V.D.1.a, for Prohibition Zone monitoring wells, post-termination monitoring is required for Eastern Area wells for a minimum of ten years after purging is terminated under Section V.C.1.a with cessation subject to EGLE approval. Defendant's request to terminate monitoring must be made in writing for review and approval pursuant to Section X of this Consent Judgment. Defendant may initiate dispute resolution pursuant to Section XVI of this Consent Judgment if EGLE does not approve its termination request.

2. Western Area. Post-termination monitoring will be required for a minimum of ten years after termination of extraction with cessation subject to EGLE approval. Except as otherwise provided pursuant to Section V.C.2, Defendant shall continue to monitor the groundwater in accordance with approved monitoring plan(s), to verify that it remains in compliance with the Non-Expansion Cleanup Objective set forth in Section V.B.1 and the Groundwater-Surface Water Interface Objective set forth in Section V.B.2. If any exceedance is detected, Defendant shall immediately notify EGLE and take whatever steps are necessary to comply with the requirements of Section V.B.1, or V.B.2, as applicable.

E. Quality Assurance Project Plan (QAPP). Defendant previously voluntarily submitted to EGLE for review and approval a QAPP, which is intended to describe the quality control, quality assurance, sampling protocol, and chain of custody procedures that will be used

in carrying out the tasks required by this Consent Judgment. EGLE shall review, and Defendant shall revise accordingly, the QAPP to ensure that it is in general accordance with the United States Environmental Protection Agency's ("U.S. EPA" or "EPA") "Guidance for Quality Assurance Project Plans," EPA QA/G-5, December 2002; and American National Standard ANSI/ASQC E4-2004, "Quality Systems For Environmental Data And Technology Programs – Requirements With Guidance For Use."

## **VI. GELMAN PROPERTY RESPONSE ACTIVITIES**

A. Gelman Property Objectives. The objectives for the Gelman Property shall be to prevent the migration of 1,4-dioxane from contaminated soils on the Gelman Property into any aquifer at concentrations or locations that cause non-compliance with the Western Area objectives set forth in Sections V.B.1 and V.B.2.

B. Response Activities.

1. Remedial Systems. Defendant shall design and implement remedial systems at the Gelman Property as necessary to achieve the Gelman Property Objectives.

2. Monitoring. Defendant shall implement an EGLE-approved Compliance Monitoring Plan to verify that the Gelman Property Soil Contamination does not cause or contribute to non-compliance with the Western Area objectives set forth in Sections V.B.1 and V.B.2, and to verify the effectiveness of any implemented remedial system.

C. Additional Source Control. Defendant shall implement the following Response Activities to reduce the mass of and/or exposure to 1,4-dioxane present in the soils and/or shallow groundwater on the Gelman Property subject to receipt of any required approvals pursuant to Section VII.D:

1. Additional Groundwater Extraction. Defendant shall install and operate

three “Phase I” extraction wells (one of which was previously installed) at the general locations depicted in the attached Attachment I to enhance control and mass removal of 1,4-dioxane from this area of shallow groundwater contamination. Defendant shall operate these extraction wells at a combined purge rate of approximately 75 gpm, subject to aquifer yield. Defendant shall have the discretion to adjust the individual well purge rates in order to optimize mass removal. Subject to Defendant’s ability to adjust individual well purge rates, Defendant shall continue to extract a combined purge rate of approximately 75 gpm, subject to aquifer yield, from this system until the 1,4-dioxane concentration in the groundwater extracted from each of these extraction wells has been reduced below 500 ug/L and, once the concentrations in all three of the wells have been reduced below 500 ug/L, Defendant shall cycle those wells off and on for several periods of time approved by EGLE to demonstrate that significant concentration rebound is not occurring. Before otherwise significantly reducing or terminating extraction from this system, Defendant shall consult with EGLE and provide a written analysis, together with the data that supports its conclusion that the concentration of 1,4-dioxane in the groundwater extracted from each of these wells has been reduced below 500 ug/L, as stated above. EGLE will review the analysis and data and provide a written response to Defendants within 56 days after receiving Defendant’s written analysis and data. If Defendant disagrees with EGLE’s conclusion, Defendant may initiate dispute resolution under Section XVI of this Consent Judgment. The Defendant shall not significantly reduce or terminate the extraction from this system during the 56-day review period or while Defendant is disputing EGLE’s conclusion.

Based on the performance achieved from these extraction wells, the Parties shall evaluate whether installation of up to three additional extraction wells at the general locations indicated on Attachment I would accelerate mass removal to a degree that meaningfully benefits the

Remediation. If EGLE determines that additional mass removal from these locations would be beneficial, Defendant shall, subject to its right to invoke Dispute Resolution under Section XVI, install and operate these additional wells pursuant to a work plan approved by EGLE.

Groundwater extracted from the extraction wells described in this subparagraph will be conveyed to the Wagner Road Treatment Facility for treatment and disposal pursuant to Defendant's NPDES Permit No. MI-0048453, as amended or re-issued.

2. Phytoremediation—Former Pond 1 and 2 Area. Defendant shall apply phytoremediation techniques in the treatment area depicted on Attachment I to reduce the potential mass flux of 1,4-dioxane from vadose zone soils in this area to the groundwater aquifers. Defendant shall plant and maintain trees in the treatment area in order to: (i) remove 1,4-dioxane mass by via biodegradation and transpiration; and (ii) extract and reduce the volume of shallow perched groundwater in this area. Defendant shall install and maintain the trees in a healthy state and replace trees as necessary to assure continued success of the phytoremediation system. Defendant shall continue to operate the phytoremediation system as set forth above until it determines that the further reduction of the mass flux of 1,4-dioxane from the vadose zone soils to the groundwater aquifers is not necessary to achieve compliance with the Gelman Property Objectives. Before significantly reducing or terminating phytoremediation in the Former Pond 1 and 2 area, Defendant shall consult with EGLE and provide a written analysis, together with the data that supports its conclusions. EGLE will review the analysis and data and provide a written response to Defendants within 56 days after receiving Defendant's written analysis and data. If Defendant disagrees with EGLE's conclusion, Defendant may initiate dispute resolution under Section XVI of this Consent Judgment. The Defendant shall not significantly reduce or terminate the phytoremediation during the 56-day review period or while

Defendant is disputing EGLE's conclusion.

3. Phytoremediation—Marshy Area. Defendant will undertake actions to reduce the percolation/infiltration of 1,4-dioxane from Marshy Area to the underlying groundwater through the application of phytoremediation techniques in the area depicted in Attachment I. The initial phase of these Response Activities may include further investigation of the Marshy Area as needed to complete the phytoremediation design regarding methods of enabling roots from trees grown in the Marshy Area to extend into deeper soils containing elevated concentrations of 1,4-dioxane. Defendant shall install and maintain the trees in a healthy state as necessary to assure continued success of the phytoremediation system. Defendant shall continue to operate the phytoremediation system as set forth above until it determines that the further reduction of the percolation/infiltration of 1,4-dioxane from the Marshy Area to the underlying groundwater is not necessary to achieve compliance with the Gelman Property Objectives. Before significantly reducing or terminating phytoremediation in the Marshy Area, Defendant shall consult with EGLE and provide a written analysis, together with the data that supports its conclusions. EGLE will review the analysis and data and provide a written response to Defendants within 56 days after receiving Defendant's written analysis and data. If Defendant disagrees with EGLE's decision to reduce or terminate the phytoremediation in the Marshy Area, Defendant may initiate dispute resolution under Section XVI of this Consent Judgment. The Defendant shall not significantly reduce or terminate the phytoremediation in the Marshy Area during the 56-day review period or while Defendant is disputing EGLE's conclusion.

4. Former Burn Pit Area. Defendant shall undertake the following Response Activities with respect to the former Burn Pit area depicted on Attachments I and J:

a. Install, operate, and maintain a Heated Soil Vapor Extraction System (“HSVE System”). The HSVE System shall be designed to reduce the mass of 1,4-dioxane present in the soils in the portion of the former Burn Pit area identified as “Heated Soil Vapor Extraction” on Attachment J. Defendant shall operate the HSVE system until 1,4-dioxane concentrations in the HSVE System’s effluent/exhaust has been reduced to levels that indicate that continued operation of the HVSE system will no longer contribute to meaningful reduction of 1,4-dioxane mass in the Former Burn Pit Area Soils or the Soil Contamination in the treatment area is eliminated, whichever occurs first. Before significantly reducing or terminating operation of the HSVE system, Defendant shall consult with EGLE and provide a written analysis, together with the data that supports its conclusion, that one or both of the above conditions has been satisfied. EGLE will review the analysis and data and provide a written response to Defendant within 56 days after receiving Defendant’s written analysis and data. If Defendant disagrees with EGLE’s conclusion, Defendant may initiate dispute resolution under Section XVI of this Consent Judgment. The Defendant shall not significantly reduce or terminate operation of the HSVE system during the 56-day review period or while Defendant is disputing EGLE’s conclusion.

Following completion of the HSVE treatment, Defendant shall install an impervious barrier over the HSVE Treatment Area to inhibit water from percolating through the soils in the former Burn Pit Area, except with regard to any areas where Defendant can demonstrate to EGLE’s satisfaction that Soil Contamination does not exist. Defendant shall maintain the impervious barrier in place until Soil Contamination is no longer present in the underlying soils.

b. Cap the portion of the former Burn Pit area identified as “Capped Area” on Attachment J with an impervious barrier to inhibit water from percolating through the

soils in the former Burn Pit area. Defendant shall maintain the impervious barrier in place until Soil Contamination is no longer present in the underlying soils.

5. After completing installation of the Response Activity systems listed in Sections VI.C.2, VI.C.3 and VI.C.4, the Defendant shall submit a separate installation report (i.e., as-built report) for each of the systems. The reports shall describe the systems as installed including, but not limited to, components of a system, location of components within the specific areas, depths of components of a system, and operational specifications of components of a system.

6. Required Approvals. Notwithstanding the above, Defendant's obligation to implement any of the additional source control Response Activities described in Section VI.C is conditioned upon receipt of any required approvals pursuant to Section VII.D.

## **VII. COMPLIANCE WITH OTHER LAWS AND PERMITS**

A. Defendant shall undertake all activities pursuant to this Consent Judgment in accordance with the requirements of all applicable laws, regulations, and permits.

B. Defendant shall apply for all permits necessary for implementation of this Consent Judgment including, without limitation, surface water discharge permit(s) and air discharge permit(s).

C. Defendant shall include in all contracts entered into by the Defendant for Remedial Action required under this Consent Judgment (and shall require that any contractor include in all subcontracts), a provision stating that such contractors and subcontractors, including their agents and employees, shall perform all activities required by such contracts or subcontracts in compliance with and all applicable laws, regulations, and permits. Defendant shall provide a copy of relevant approved work plans to any such contractor or subcontractor.



D. The Plaintiffs agree to provide reasonable cooperation and assistance to the Defendant in obtaining necessary approvals and permits for Remedial Action. Plaintiffs shall not unreasonably withhold or delay any required approvals or permits for Defendant's performance of Remedial Action. Plaintiffs expressly acknowledge that one or more of the following permits and approvals may be a necessary prerequisite for one or more of the Response Activities set forth in this Consent Judgment:

1. Renewal of NPDES Permit No. MI-0048453 with respect to the discharge of treated groundwater to the unnamed tributary of Honey Creek.

2. An NPDES Permit that authorizes the discharge of groundwater to First Sister Lake in connection with operation of the Parklake Well following treatment with ozone/hydrogen peroxide technology that has effluent limitations, discharge limits (other than volume), and other conditions no more restrictive than those included in Defendant's 2014 NPDES Permit.

3. Negotiation and execution of an access agreement between Defendant and the City of Ann Arbor providing reasonable and necessary access to the City-owned parcel at Parklake Avenue and Jackson Road with respect to installation and operation of an extraction well, operation and maintenance of a groundwater treatment unit, and disposal of treated groundwater.

4. An Air Permit for discharges of contaminants to the atmosphere for vapor extraction systems, including the HSVE system described in Subsection VI.C.4, under terms reasonably acceptable to Defendant and as necessary if such systems are part of the remedial design.

5. Wetlands Permit(s) from EGLE and/or Scio Township if necessary for the

response activities described in Section VI.C.3 with terms reasonably acceptable to Defendant.

6. An Industrial User's Permit to be issued by the City of Ann Arbor for use of the sewer to dispose of treated or untreated purged groundwater from the Evergreen and/or Maple Road Wells. Plaintiffs have no objection to receipt by the Ann Arbor Wastewater Treatment Plant of the purged groundwater extracted pursuant to the terms and conditions of this Consent Judgment, and acknowledge that receipt of the purged groundwater would not necessitate any change in current and proposed residual management programs of the Ann Arbor Wastewater Treatment Plant.

7. Permit(s) or permit exemptions to be issued by EGLE to authorize the reinjection of purged and treated groundwater in the Eastern Area and Western Area.

8. Surface water discharge permit(s) for discharge into surface waters in the area of Little Lake, if necessary.

9. Approval of the City of Ann Arbor and the Washtenaw County Drain Commissioner to use storm drains or sewers for the remedial programs.

10. Washtenaw County permits as necessary for the installation of extraction wells, monitoring wells, and borings.

### **VIII. SAMPLING AND ANALYSIS**

Defendant shall make available to EGLE the results of all sampling, tests, and/or other data generated in the performance or monitoring of any requirement under this Consent Judgment. Sampling data generated consistent with this Consent Judgment shall be admissible in evidence in any proceeding related to enforcement of this Consent Judgment without waiver by any Party of any objection as to weight or relevance. EGLE and/or their authorized representatives, at their discretion, may take split or duplicate samples and observe the sampling

event. EGLE shall make available to Defendant the results of all sampling, tests, and/or other data generated in the performance or monitoring of any requirement under this Consent Judgment. Defendant will provide EGLE with reasonable notice of changes in the schedule of data collection activities included in the progress reports submitted pursuant to Section XII.

### **IX. ACCESS**

A. From the effective date of this Consent Judgment, EGLE, its authorized employees, agents, representatives, contractors, and consultants, upon presentation of proper identification, shall have the right at all reasonable times to enter the Site and any property to which access is required for the implementation of this Consent Judgment, to the extent access to the property is owned, controlled by, or available to the Defendant, for the purpose of conducting any activity authorized by this Consent Judgment, including, but not limited to:

1. Monitoring of the Remedial Action or any other activities taking place pursuant to this Consent Judgment on the property;
2. Verification of any data or information submitted to EGLE;
3. Conduct of investigations related to 1,4-dioxane concentrations at the Site;
4. Collection of samples;
5. Assessment of the need for, or planning and implementing of, Response Activities at the Site; and
6. Inspection and copying of non-privileged documents including records, operating logs, contracts, or other documents required to assess Defendant's compliance with this Consent Judgment.

All Parties with access to the Site or other property pursuant to this Section shall comply with all applicable health and safety laws and regulations.

B. To the extent that the Site or any other area where Remedial Action is to be performed by the Defendant under this Consent Judgment is owned or controlled by persons other than the Defendant, Defendant shall use its best efforts to secure from such persons access for Defendant, EGLE, and their authorized employees, agents, representatives, contractors, and consultants. Defendant shall provide EGLE with a copy of each access agreement secured pursuant to this Section. For purposes of this Section, “best efforts” includes, but is not limited to, seeking judicial assistance to secure such access pursuant to MCL 324.20135a.

#### **X. APPROVALS OF SUBMISSIONS**

Upon receipt of any plan, report, or other item that is required to be submitted for approval pursuant to this Consent Judgment, as soon as practicable, but in no event later than 56 days after receipt of such submission, EGLE will: (1) approve the submission or (2) submit to Defendant changes in the submission that would result in approval of the submission. EGLE will (1) approve a feasibility study or plan that proposes a risk based cleanup or a remedy that requires public comment, or (2) submit to Defendant changes in such submittal that would result in approval in the time provided under Part 201. If EGLE does not respond within 56 days, Defendant may submit the matter to dispute resolution pursuant to Section XVI. Upon receipt of a notice of approval or changes from EGLE, Defendant shall proceed to take any action required by the plan, report, or other item, as approved or as may be modified to address the deficiencies identified by EGLE. If Defendant does not accept the changes proposed by EGLE, Defendant may submit the matter to dispute resolution pursuant to Section XVI.

#### **XI. PROJECT COORDINATORS**

A. Plaintiffs designate Daniel Hamel as EGLE’s Project Coordinator. Defendant designates Lawrence Gelb as Defendant’s Project Coordinator. Defendant’s Project Coordinator

shall have primary responsibility for implementation of the Remedial Action at the Site. EGLE's Project Coordinator will be the primary designated representative for Plaintiffs with respect to implementation of the Remedial Action at the Site. All communication between Defendant and EGLE, including all documents, reports, approvals, other submissions, and correspondence concerning the activities performed pursuant to the terms and conditions of this Consent Judgment, shall be directed through the Project Coordinators. If any Party changes its designated Project Coordinator, that Party shall provide the name, address, email address and telephone number of the successor in writing to the other Party seven days prior to the date on which the change is to be effective. This Section does not relieve Defendant from other reporting obligations under the law.

B. EGLE may designate other authorized representatives, employees, contractors, and consultants to observe and monitor the progress of any activity undertaken pursuant to this Consent Judgment. EGLE's Project Coordinator shall provide Defendant's Project Coordinator with the names, addresses, telephone numbers, positions, and responsibilities of any person designated pursuant to this Section.

## **XII. PROGRESS REPORTS**

Defendant shall provide to EGLE written quarterly progress reports that shall: (1) describe the actions which have been taken toward achieving compliance with this Consent Judgment during the previous three months; (2) describe data collection and activities scheduled for the next three months; and (3) include all results of sampling and tests and other data received by Defendant, its consultants, engineers, or agents during the previous three months relating to Remedial Action performed pursuant to this Consent Judgment. Defendant shall submit the first quarterly report to EGLE within 120 days after entry of this Consent Judgment,

and by the 30th day of the month following each quarterly period thereafter, as feasible, until termination of this Consent Judgment as provided in Section XXV.

### **XIII. RESTRICTIONS ON ALIENATION**

A. Defendant shall not sell, lease, or alienate the Gelman Property until: (1) it places an EGLE-approved land use or resource use restrictions on the affected portion(s) of the Gelman Property; and (2) any purchaser, lessee, or grantee provides to EGLE its written agreement providing that the purchaser, lessee, or grantee will not interfere with any term or condition of this Consent Judgment. Notwithstanding any purchase, lease, or grant, Defendant shall remain obligated to comply with all terms and conditions of this Consent Judgment.

B. Any deed, title, or other instrument of conveyance regarding the Gelman Property shall contain a notice that Defendant's Property is the subject of this Consent Judgment, setting forth the caption of the case, the case number, and the court having jurisdiction herein.

### **XIV. FORCE MAJEURE**

Any delay attributable to a Force Majeure shall not be deemed a violation of Defendant's obligations under this Consent Judgment.

A. "Force Majeure" is defined as an occurrence or nonoccurrence arising from causes beyond the control of Defendant or of any entity controlled by the Defendant performing Remedial Action, such as Defendant's employees, contractors, and subcontractors. Such occurrence or nonoccurrence includes, but is not limited to: (1) an Act of God; (2) untimely review of permit applications or submissions; (3) acts or omissions of third parties for which Defendant is not responsible; (4) insolvency of any vendor, contractor, or subcontractor retained

by Defendant as part of implementation of this Consent Judgment; and (5) delay in obtaining necessary access agreements under Section IX that could not have been avoided or overcome by due diligence. “Force Majeure” does not include unanticipated or increased costs, changed financial circumstances, or nonattainment of the treatment and termination standards set forth in Sections V and VI.

B. When circumstances occur that Defendant believes constitute Force Majeure, Defendant shall notify EGLE by telephone of the circumstances within 48 hours after Defendant first believes those circumstances to apply. Within 14 working days after Defendant first believes those circumstances to apply, Defendant shall supply to EGLE, in writing, an explanation of the cause(s) of any actual or expected delay, the anticipated duration of the delay, the measures taken and the measures to be taken by Defendant to avoid, minimize, or overcome the delay, and the timetable for implementation of such measures. Failure of Defendant to comply with the written notice provisions of this Section shall constitute a waiver of Defendant’s right to assert a claim of Force Majeure with respect to the circumstances in question.

C. A determination by EGLE that an event does not constitute Force Majeure, that a delay was not caused by Force Majeure, or that the period of delay was not necessary to compensate for Force Majeure may be subject to dispute resolution under Section XVI of this Consent Judgment.

D. EGLE shall respond, in writing, to any request by Defendant for a Force Majeure extension within 30 days of receipt of the Defendant’s request. If EGLE does not respond within that time period, Defendant’s request shall be deemed granted. If EGLE agrees that a delay is or was caused by Force Majeure, Defendant’s delays shall be excused, stipulated penalties shall not accrue, and EGLE shall provide Defendant such additional time as may be necessary to

compensate for the Force Majeure event.

E. Delay in achievement of any obligation established by this Consent Judgment shall not automatically justify or excuse delay in achievement of any subsequent obligation unless the subsequent obligation automatically follows from the delayed obligation.

**XV. REVOCATION OR MODIFICATION OF LICENSES OR PERMITS**

Any delay attributable to the revocation or modification of licenses or permits obtained by Defendant to implement remediation actions as set forth in this Consent Judgment shall not be deemed a violation of Defendant's obligations under this Consent Judgment, provided that such revocation or modification arises from causes beyond the control of Defendant or of any entity controlled by the Defendant performing Remedial Action, such as Defendant's employees, contractors, and subcontractors.

A. Licenses or permits that may need to be obtained or modified by Defendant to implement the Remedial Actions are those specified in Section VII.D. and licenses, easements, and other agreements for access to property or rights of way on property necessary for the installation of remedial systems required by this Consent Judgment.

B. A revocation or modification of a license or permit within the meaning of this Section means withdrawal of permission, denial of permission, a limitation or a change in license or permit conditions that delays the implementation of all or part of a remedial system. Revocation or modification due to Defendant's violation of a license or permit (or any conditions of a license or permit) shall not constitute a revocation or modification covered by this Section.

C. When circumstances occur that Defendant believes constitute revocation or modification of a license or permit, Defendant shall notify EGLE by telephone of the circumstances within 48 hours after Defendant first believes those circumstances to apply.



Within 14 working days after Defendant first believes those circumstances to apply, Defendant shall supply to EGLE, in writing, an explanation of the cause(s) of any actual or expected delay, the anticipated duration of the delay, the measures taken and the measures to be taken by Defendant to avoid, minimize, or overcome the delay, and the timetable for implementation of such measures. Failure of Defendant to comply with the written notice provisions of this Section shall constitute a waiver of Defendant's right to assert a claim of revocation or modification of a license or permit with respect to the circumstances in question.

D. A determination by EGLE that an event does not constitute revocation or modification of a license or permit, that a delay was not caused by revocation or modification of a license or permit, or that the period of delay was not necessary to compensate for revocation or modification of a license or permit may be subject to dispute resolution under Section XVI of this Consent Judgment.

E. EGLE shall respond, in writing, to any request by Defendant for a revocation or modification of a license or permit extension within 30 days of receipt of the Defendant's request. If EGLE does not respond within that time period, Defendant's request shall be deemed granted. If EGLE agrees that a delay is or was caused by revocation or modification of a license or permit, Defendant's delays shall be excused, stipulated penalties shall not accrue, and EGLE shall provide Defendant such additional time as may be necessary to compensate for the revocation or modification of a license or permit.

F. Delay in achievement of any obligation established by this Consent Judgment shall not automatically justify or excuse delay in achievement of any subsequent obligation unless the subsequent obligation automatically follows from the delayed obligation.

## **XVI. DISPUTE RESOLUTION**

A. The dispute resolution procedures of this Section shall be the exclusive mechanism to resolve disputes arising under this Consent Judgment and shall apply to all provisions of this Consent Judgment except for disputes related to Prohibition Zone boundary modification under Sections V.A.2.f and V.A.6, whether or not particular provisions of this Consent Judgment in question make reference to the dispute resolution provisions of this Section. Any dispute that arises under this Consent Judgment initially shall be the subject of informal negotiations between the Parties. The period of negotiations shall not exceed ten working days from the date of written notice by EGLE or the Defendant that a dispute has arisen. This period may be extended or shortened by agreement of EGLE or the Defendant.

B. Immediately upon expiration of the informal negotiation period (or sooner if upon agreement of the parties), EGLE shall provide to Defendant a written statement setting forth EGLE's proposed resolution of the dispute. Such resolution shall be final unless, within 15 days after receipt of EGLE's proposed resolution (clearly identified as such under this Section), Defendant files a petition for resolution with the Washtenaw County Circuit Court setting forth the matter in dispute, the efforts made by the Parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of this Consent Judgment.

C. Within ten days of the filing of the petition, EGLE may file a response to the petition, and unless a dispute arises from the alleged failure of EGLE to timely make a decision, EGLE will submit to the Court all documents containing information related to the matters in dispute, including documents provided to EGLE by Defendant. In the event of a dispute arising from the alleged failure of EGLE to timely make a decision, within ten days of filing of the

petition, each party shall submit to the Court correspondence, reports, affidavits, maps, diagrams, and other documents setting forth facts pertaining to the matters in dispute. Those documents and this Consent Judgment shall comprise the record upon which the Court shall resolve the dispute. Additional evidence may be taken by the Court on its own motion or at the request of either party if the Court finds that the record is incomplete or inadequate. Review of the petition shall be conducted by the Court and shall be confined to the record. The review shall be independent of any factual or legal conclusions made by the Court prior to the date of entry of this Consent Judgment.

D. The Court shall uphold the decision of EGLE on the issue in dispute unless the Court determines that the decision is any of the following:

1. Inconsistent with this Consent Judgment;
2. Not supported by competent, material, and substantial evidence on the whole record;
3. Arbitrary, capricious, or clearly an abuse or unwarranted exercise of discretion; or
4. Affected by other substantial and material error of law.

E. The filing of a petition for resolution of a dispute shall not by itself extend or postpone any obligation of Defendant under this Consent Judgment, provided, however, that payment of stipulated penalties with respect to the disputed matter shall be stayed pending resolution of the dispute. Notwithstanding the stay of payment, stipulated penalties shall accrue as provided in Section XVII. Stipulated penalties that have accrued with respect to the matter in dispute shall not be assessed by the Court and shall be dissolved if Defendant prevails on the matter. The Court may also direct that stipulated penalties shall not be assessed and paid as

provided in Section XVII upon a determination that there was a substantial basis for Defendant's position on the disputed matter.

**XVII. STIPULATED PENALTIES**

A. Except as otherwise provided, if Defendant fails or refuses to comply with any term or condition in Sections IV, V, VI, VII, or VIII, or with any plan, requirement, or schedule established pursuant to those Sections, then Defendant shall pay stipulated penalties in the following amounts for each working day for every failure or refusal to comply or conform:

<u>Period of Delay</u>	<u>Penalty Per Violation Per Day</u>
1st through 15th Day	\$ 1,000
15th through 30th Day	\$ 1,500
Beyond 30 Days	\$ 2,000

B. Except as otherwise provided if Defendant fails or refuses to comply with any other term or condition of this Consent Judgment, Defendant shall pay to EGLE stipulated penalties of \$500.00 per working day for each and every failure to comply.

C. If Defendant is in violation of this Consent Judgment, Defendant shall notify EGLE of any violation no later than five working days after first becoming aware of such violation, and shall describe the violation.

D. Stipulated penalties shall begin to accrue upon the next day after performance was due or other failure or refusal to comply occurred. Penalties shall continue to accrue until the final day of correction of the noncompliance. Separate penalties shall accrue for each separate failure or refusal to comply with the terms and conditions of this Consent Judgment. Penalties may be waived in whole or in part by EGLE or may be dissolved by the Court pursuant to Section XVII.

E. Stipulated penalties shall be paid no later than 14 working days after receipt by

Defendant of a written demand from EGLE. Defendant shall make payment by transmitting a check in the amount due, payable to the “State of Michigan,” addressed to the Revenue Control Unit; Finance Section, Administration Division; Michigan Department of Environment, Great Lakes, and Energy; P.O. Box 30657; Lansing, MI 48909-8157. The check shall be transmitted via Courier to the Revenue Control Unit; Finance Section, Administration Division; Michigan Department of Environment, Great Lakes, and Energy; Constitution Hall, 5th Floor South Tower; 525 West Allegan Street; Lansing, MI 48933-2125. To ensure proper credit, Defendant shall include the settlement ID - ERD1902 on the payment.

F. Plaintiffs agree that, in the event that an act or omission of Defendant constitutes a violation of this Consent Judgment subject to stipulated penalties and a violation of other applicable law, Plaintiffs will not impose upon Defendant for that violation both the stipulated penalties provided under this Consent Judgment and the civil penalties permitted under other applicable laws. EGLE reserves the right to pursue any other remedy or remedies to which they may be entitled under this Consent Judgment or any applicable law for any failure or refusal of the Defendant to comply with the requirements of this Consent Judgment.

**XVIII. PLAINTIFFS’ COVENANT NOT TO SUE AND RESERVATION OF RIGHTS**

A. Except as otherwise provided in this Consent Judgment, Plaintiffs covenant not to sue or take administrative action for Covered Matters against Defendant, its officers, employees, agents, directors, and any persons acting on its behalf or under its control.

B. “Covered Matters” shall mean any and all claims available to Plaintiffs under federal and state law arising out of the subject matter of the Plaintiffs’ Complaint with respect to the following:

1. Claims for injunctive relief to address soil, groundwater, and surface water

contamination at or emanating from the Gelman Property;

2. Claims for civil penalties and costs;
3. Claims for natural resource damages;
4. Claims for reimbursement of response costs incurred prior to entry of this Consent Judgment or incurred by Plaintiffs for provision of alternative water supplies in the Evergreen Subdivision; and
5. Claims for reimbursement of costs incurred by Plaintiffs for overseeing the implementation of this Consent Judgment.

C. “Covered Matters” does not include:

1. Claims based upon a failure by Defendant to comply with the requirements of this Consent Judgment;
2. Liability for violations of federal or state law which occur during implementation of the Remedial Action; and
3. Liability arising from the disposal, treatment, or handling of any hazardous substance removed from the Site.

D. With respect to liability for alleged past violations of law, this covenant not to sue shall take effect on the effective date of this Consent Judgment. With respect to future liability for performance of response activities required to be performed under this Consent Judgment, the covenant not to sue shall take effect upon issuance by EGLE of the Certificate of Completion in accordance with Section XXV.

E. Notwithstanding any other provision in this Consent Judgment: (1) EGLE reserves the right to institute proceedings in this action or in a new action seeking to require Defendant to perform any additional response activity at the Site; and (2) EGLE reserves the

right to institute proceedings in this action or in a new action seeking to reimburse EGLE for response costs incurred by the State of Michigan relating to the Site. EGLE's rights in Sections XVIII.E.1 and E.2 apply if the following conditions are met:

1. For proceedings prior to EGLE's certification of completion of the Remedial Action concerning the Site,
  - a. (i) conditions at the Site, previously unknown to EGLE, are discovered after entry of this Consent Judgment, (ii) new information previously unknown to EGLE is received after entry of this Consent Judgment, or (iii) EGLE adopts one or more new, more restrictive cleanup criteria for 1,4-dioxane pursuant to Part 201 after entry of this Consent Judgment; and
  - b. these previously unknown conditions, new information, and/or change in criteria indicate that the Remedial Action is not protective of the public health, safety, welfare, and the environment; and
2. For proceedings subsequent to EGLE's certification of completion of the Remedial Action concerning the Site,
  - a. (i) conditions at the Site, previously unknown to EGLE, are discovered after certification of completion by EGLE, (ii) new information previously unknown to EGLE is received after certification of completion by EGLE, or (iii) EGLE adopts one or more new, more restrictive cleanup criteria for 1,4-dioxane pursuant to Part 201, after certification of completion by EGLE; and
  - b. these previously unknown conditions, new information, and/or change in criteria indicate that the Remedial Action is not protective of the public health, safety, welfare, and the environment.

If EGLE adopts one or more new, more restrictive, cleanup criteria, EGLE's rights in Sections XVIII.E.1 and E.2 shall also be subject to Defendant's right to seek another site-specific criterion(ia) that is protective of public health, safety, welfare, and the environment and/or to argue that EGLE has not made the demonstration(s) required under this Section.

F. Nothing in this Consent Judgment shall in any manner restrict or limit the nature or scope of Response Activities that may be taken by EGLE in fulfilling its responsibilities under federal and state law, and this Consent Judgment does not release, waive, limit, or impair in any manner the claims, rights, remedies, or defenses of EGLE against a person or entity not a party to this Consent Judgment.

G. Except as expressly provided in this Consent Judgment, EGLE reserves all other rights and defenses that they may have, and this Consent Judgment is without prejudice, and shall not be construed to waive, estop, or otherwise diminish EGLE's right to seek other relief with respect to all matters other than Covered Matters.

**XIX. DEFENDANT'S COVENANT NOT TO SUE AND RESERVATION OF RIGHTS**

A. Defendant hereby covenants not to sue and agrees not to assert any claim or cause of action against EGLE or any other agency of the State of Michigan with respect to environmental contamination at the Site or response activities relating to the Site arising from this Consent Judgment.

B. Notwithstanding any other provision in this Consent Judgment, for matters that are not Covered Matters as defined in Section XVIII.B, or in the event that Plaintiffs institute proceedings as allowed under Section XVIII.E., Defendant reserves all other rights, defenses, or counterclaims that it may have with respect to such matters and this Consent Judgment is without prejudice, and shall not be construed to waive, estop, or otherwise diminish Defendant's right to



seek other relief and to assert any other rights and defenses with respect to such other matters.

C. Nothing in this Consent Judgment shall in any way impair Defendant's rights, claims, or defenses with respect to any person not a party to this Consent Judgment.

**XX. INDEMNIFICATION, INSURANCE, AND FINANCIAL ASSURANCE**

A. Defendant shall indemnify and save and hold harmless the State of Michigan and its departments, agencies, officials, agents, employees, contractors, and representatives from any and all claims or causes of action arising from, or on account of, acts or omissions of Defendant, its officers, employees, agents, and any persons acting on its behalf or under its control in carrying out Remedial Action pursuant to this Consent Judgment. EGLE shall not be held out as a party to any contract entered into by or on behalf of Defendant in carrying out activities pursuant to this Consent Judgment. Neither the Defendant nor any contractor shall be considered an agent of EGLE. Defendant shall not indemnify or save and hold harmless Plaintiffs from their own negligence pursuant to this Section.

B. Prior to commencing any Remedial Action on the Gelman Property, Defendant shall secure, and shall maintain for the duration of the Remedial Action, comprehensive general liability insurance with limits of \$1,000,000.00, combined single limit, naming as an additional insured the State of Michigan. If Defendant demonstrates by evidence satisfactory to EGLE that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering the same risks but in a lesser amount, then with respect to that contractor or subcontractor, Defendant need provide only that portion, if any, of the insurance described above that is not maintained by the contractor or subcontractor.

C. Financial Assurance

1. Defendant shall be responsible for providing and maintaining financial assurance in a mechanism approved by EGLE in an amount sufficient to cover the estimated cost to assure performance of the response activities required to meet the remedial objectives of this Consent Judgment including, but not limited to, investigation, monitoring, operation and maintenance, and other costs (collectively referred to as “Long-Term Remedial Action Costs”). Defendant shall continuously maintain a financial assurance mechanism (“FAM”) until EGLE’s Remediation and Redevelopment Division (“RRD”) Chief or his or her authorized representative notifies it in writing that it is no longer required to maintain a FAM.

2. The Letter of Credit provided in Attachment K is the initial FAM approved by EGLE. Defendant shall be responsible for providing and maintaining financial assurance in a mechanism acceptable to EGLE to assure the performance of the Long Term Remedial Action Costs required by Defendant’s selected remedial action.

3. The FAM shall remain in an amount sufficient to cover Long Term Remedial Action Costs for a 30-year period. Unless Defendant opts to use and satisfies the Financial Test or Financial Test/Corporate Guarantee as provided in Section XX.C.8, the FAM shall remain in a form that allows EGLE to immediately contract for the response activities for which financial assurance is required in the event Defendant fails to implement the required tasks, subject to Defendant’s rights under Sections XIV and XVI.

4. Within 120 days of the Effective Date of this Fourth Amended Consent Judgment, Defendant shall provide EGLE with an estimate of the amount of funds necessary to assure Long Term Remedial Action Costs for the following 30-year period based upon an annual estimate of costs for the response activities required by this Fourth Amended Consent Judgment

as if they were to be conducted by a person under contract to EGLE (the “Updated Long Term Remedial Action Cost Estimate”). The Updated Long Term Remedial Action Cost Estimate shall include all assumptions and calculations used in preparing the cost estimate and shall be signed by an authorized representative of Defendant who shall confirm the validity of the data. Defendant may only use a present worth analysis if an interest accruing FAM is selected. Within 60 days after Defendant’s submittal of the Updated Long Term Remedial Action Cost Estimate, Defendant shall capitalize or revise the FAM in a manner acceptable to EGLE to address Long Term Remedial Action Costs unless otherwise notified by EGLE. If EGLE disagrees with the conclusions of the Updated Long Term Remedial Action Cost Estimate, Defendant shall capitalize the FAM to a level acceptable to EGLE within 30 days of EGLE notification, subject to Dispute Resolution under Section XVI.

5. Sixty days prior to the 5-year anniversary of the Effective Date of this Fourth Amended Consent Judgment and each subsequent 5-year anniversary, Defendant shall provide to EGLE a report containing the actual Long Term Remedial Action Costs for the previous 5-year period and an estimate of the amount of funds necessary to assure Long Term Remedial Action Costs for the following 30-year period given the financial trends in existence at the time of preparation of the report (“Long Term Remedial Action Cost Report”). The cost estimate shall be based upon an annual estimate of maximum costs for the response activities required by this Fourth Amended Consent Judgment as if they were to be conducted by a person under contract to EGLE, provided that, if Defendant is using the Financial Test or Corporate Guarantee/Financial Test under Section XX.C.8, below, Defendant may use an estimate on its internal costs to satisfy the Financial Test. The Long Term Remedial Action Cost Report shall also include all assumptions and calculations used in preparing the necessary cost estimate and

shall be signed by an authorized representative of Defendant who shall confirm the validity of the data. Defendant may only use a present worth analysis if an interest accruing FAM is selected.

6. Within 60 days after Defendant's submittal of the Long Term Remedial Action Cost Report to EGLE, Defendant shall capitalize or revise the FAM in a manner acceptable to EGLE to address Long Term Remedial Action Costs consistent with the conclusions of the Long Term Remedial Action Cost Report unless otherwise notified by EGLE. If EGLE disagrees with the conclusions of the Long Term Remedial Action Cost Report, Defendant shall capitalize the FAM to a level acceptable to EGLE within 30 days of EGLE notification, subject to dispute resolution under Section XVI. If, at any time, EGLE determines that the FAM does not secure sufficient funds to address Long Term Remedial Action Costs, Defendant shall capitalize the FAM or provide an alternate FAM to secure any additional costs within 30 days of request by EGLE, subject to dispute resolution under Section XVI.

7. If, pursuant to the Long Term Remedial Action Cost Report, Defendant can demonstrate that the FAM provides funds in excess of those needed for Long Term Remedial Action Costs, Defendant may request a modification in the amount. Any requested FAM modifications must be accompanied by a demonstration that the proposed FAM provides adequate funds to address future Long Term Remedial Action Costs. Upon EGLE approval of the request, Defendant may modify the FAM as approved by EGLE. Modifications to the FAM pursuant to this Section shall be approved by EGLE RRD Chief or his or her authorized representative, subject to dispute resolution under Section XVI.

8. If Defendant chooses to use the Financial Test or Corporate Guarantee/Financial Test attached as Attachment L (hereinafter, the term "Financial Test" refers

to both an independent financial test or a financial test utilized in conjunction with a corporate guarantee), Defendant shall, within 90 days after the end of Defendant's next fiscal year and the end of each succeeding fiscal year, submit to EGLE the necessary forms and supporting documents to demonstrate to the satisfaction of EGLE that Defendant can continue to meet the Financial Test requirements. If Defendant can no longer meet the financial test requirements, Defendant shall submit a proposal for an alternate FAM to satisfy its financial obligations with respect to this Consent Judgment.

9. If the Financial Test is being used as the FAM, EGLE, based on a reasonable belief that Defendant may no longer meet the requirements for the Financial Test, may require reports of financial condition at any time from Defendant, and/or require Defendant to submit updated Financial Test information to determine whether it meets the Financial Test criteria. Defendant shall provide, with reasonable promptness to EGLE, any other data and information that may reasonably be expected to materially adversely affect Defendant's ability to meet the Financial Test requirements. If EGLE finds that Defendant no longer meets the Financial Test requirements, Defendant shall, within 30 days after notification from EGLE, submit a proposal for an alternate FAM to satisfy its financial obligations with respect to this Consent Judgment, subject to dispute resolution under Section XVI.

10. If the Financial Test/Corporate Guarantee is used as the FAM, Defendant shall comply with the terms of the Corporate Guarantee. The Corporate Guarantee shall remain in place until Long-Term Remedial Action Costs are no longer required or Defendant establishes an alternate FAM acceptable to EGLE.

11. If Defendant wishes to change the type of FAM or establish a new FAM, Defendant shall submit a request to EGLE for approval. Upon EGLE approval of the request,

Defendant may change the type of FAM or establish the new FAM as approved by EGLE. Modifications to the FAM pursuant to this Section shall be approved by EGLE RRD Chief or his or her authorized representative, subject to dispute resolution under Section XVI.

12. If Defendant dissolves or otherwise ceases to conduct business and fails to make arrangements acceptable to EGLE for the continued implementation of all activities required by this Consent Judgment, all rights under this Consent Judgment regarding the FAM shall immediately and automatically vest in EGLE in accordance with the FAM.

### **XXI. RECORD RETENTION**

Defendant, Plaintiffs, and their representatives, consultants, and contractors shall preserve and retain, during the pendency of this Consent Judgment and for a period of ten years after its termination, all records, sampling or test results, charts, and other documents that are maintained or generated pursuant to any requirement of this Consent Judgment, including, but not limited to, documents reflecting the results of any sampling or tests or other data or information generated or acquired by Plaintiffs or Defendant, or on their behalf, with respect to the implementation of this Consent Judgment. After the ten-year period of document retention, the Defendant and its successors shall notify EGLE, in writing, at least 90 days prior to the destruction of such documents or records, and upon request, the Defendant and/or its successor shall relinquish custody of all records and documents to EGLE.

### **XXII. ACCESS TO INFORMATION**

Upon request, EGLE and Defendant shall provide to each other copies of or access to all non-privileged documents and information within their possession and/or control or that of their employees, contractors, agents, or representatives, relating to activities at the Site or to the implementation of this Consent Judgment, including, but not limited to, sampling, analysis, chain

of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information related to the Remedial Action. Upon request, Defendant shall also make available to EGLE, their employees, contractors, agents, or representatives with knowledge or relevant facts concerning the performance of the Remedial Action. The Plaintiffs shall treat as confidential all documents provided to Plaintiffs by the Defendant marked “confidential” or “proprietary.”

### **XXIII. NOTICES**

Whenever under the terms of this Consent Judgment notice is required to be given or a report, sampling data, analysis, or other document is required to be forwarded by one Party to the other, such notice or document shall be directed to the following individuals at the specified addresses or at such other address as may subsequently be designated in writing:

**For Plaintiffs:**

Daniel Hamel  
Project Coordinator  
Michigan Department  
of Environment, Great  
Lakes, and Energy,  
Remediation and Redevelopment  
Division  
301 East Louis Glick Highway  
Jackson, MI 49201

**For Defendants:**

Lawrence Gelb  
Gelman Sciences Inc.  
642 South Wagner Road  
Ann Arbor, MI 48106

and

Michael L. Caldwell  
Zausmer, P.C.  
32255 Northwestern Hwy., Ste. 225  
Farmington Hills, MI 48334

Any party may substitute for those designated to receive such notices by providing prior written notice to the other parties.

### **XXIV. MODIFICATION**

This Consent Judgment may not be modified unless such modification is in writing, signed by the Plaintiffs and the Defendant, and approved and entered by the Court. Remedial Plans, work plans, or other submissions made pursuant to this Consent Judgment may be modified by mutual agreement of the Defendant and EGLE.

#### **XXV. CERTIFICATION AND TERMINATION**

A. When Defendant determines that it has completed all Remedial Action required by this Consent Judgment, Defendant shall submit to EGLE a Notification of Completion and a draft final report. The draft final report must summarize all Remedial Action performed under this Consent Judgment and the performance levels achieved. The draft final report shall include or refer to any supporting documentation.

B. Upon receipt of the Notification of Completion, EGLE will review the Notification of Completion and the accompanying draft final report, any supporting documentation, and the actual Remedial Action performed pursuant to this Consent Judgment. After conducting this review, and not later than three months after receipt of the Notification of Completion, EGLE shall issue a Certificate of Completion upon a determination by EGLE that Defendant has completed satisfactorily all requirements of this Consent Decree, including, but not limited to, completion of all Remedial Action, achievement of all termination and treatment standards required by this Consent Judgment, compliance with all terms and conditions of this Consent Judgment, and payment of any and all stipulated penalties owed to EGLE. If EGLE does not respond to the Notification of Completion within three months after receipt of the Notification of Completion, Defendant may submit the matter to dispute resolution pursuant to Section XVI. This Consent Judgment shall terminate upon motion and order of this Court after issuance of the Certificate of Completion. Upon issuance, the Certificate of Completion may be



recorded.

**XXVI. EFFECTIVE DATE**

The effective date of this Consent Judgment shall be the date upon which this Consent Judgment is entered by the Court.

**XXVII. SEVERABILITY**

The provisions of this Consent Judgment shall be severable. Should any provision be declared by a court of competent jurisdiction to be inconsistent with federal or state law, and therefore unenforceable, the remaining provisions of this Consent Judgment shall remain in full force and effect.

**XXVIII. SIGNATORIES**

Each undersigned representatives of a Party to this Consent Judgment certifies that he or she is fully authorized by the Party to enter into this Consent Judgment and to legally bind such Party to the respective terms and conditions of this Consent Judgment.

# *EXHIBIT M*

STATE OF MICHIGAN

IN THE CIRCUIT COURT FOR THE COUNTY OF WASHTENAW

ATTORNEY GENERAL FOR THE  
STATE OF MICHIGAN, *ex rel.* MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
AND ENVIRONMENT,

Case No. 88-34734-CE  
Hon. Timothy P. Connors

Plaintiff,

and

CITY OF ANN ARBOR, WASHTENAW COUNTY,  
WASHTENAW COUNTY HEALTH  
DEPARTMENT, WASHTENAW COUNTY  
HEALTH OFFICER ELLEN RABINOWITZ, in her  
official capacity, the HURON RIVER WATERSHED  
COUNCIL, and SCIO TOWNSHIP,

**ORDER IMPLEMENTING  
REVISED CLEANUP CRITERIA  
AND MODIFYING EXISTING  
RESPONSE ACTIVITY ORDERS  
AND JUDGMENTS (“2021  
ORDER”)**

Intervening Plaintiffs,

-v-

GELMAN SCIENCES, INC., d/b/a PALL LIFE  
SCIENCES, a Michigan Corporation,

Defendant.

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Attorneys for Scio Township

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**ORDER IMPLEMENTING REVISED CLEANUP CRITERIA AND MODIFYING  
EXISTING RESPONSE ACTIVITY ORDERS AND JUDGMENTS (“2021 ORDER”)**

At a session of said Court  
held in the City of Ann Arbor, County of Washtenaw  
on \_\_\_\_\_  
PRESENT \_\_\_\_\_  
Circuit Court Judge

This Order Implementing Revised Cleanup Criteria and Modifying Existing Response Activity Orders and Judgments (“2021 Order”) is entered in recognition of, and with the intention of, furtherance of the public interest by (1) addressing environmental concerns raised in Plaintiffs’ Complaint; and (2) expediting Response Activities and Remedial Actions at the Site, as defined herein.

Currently in effect and governing the Response Activities and Remedial Actions at the Site are: (1) the Consent Judgment between Plaintiffs and Defendant entered on October 26, 1992, as modified by the First Amendment to Consent Judgment entered by the Court on September 23, 1996, the Second Amendment to Consent Judgment entered by the Court on October 20, 1999, and the Third Amendment to Consent Judgment entered by the Court on March 8, 2011; (2) the Opinion and Order Regarding Remediation of Contamination of the “Unit E” Aquifer, also known as the “Unit E Order,” dated December 17, 2004; and (3) the Order Prohibiting Groundwater Use, also known as the “Prohibition Zone Order,” dated May 17, 2005, as amended by the March 8, 2011, Stipulated Order that established an Expanded Prohibition Zone and incorporated terms of the Prohibition Zone Order, as amended, into the Third Amendment to the Consent Judgment (Collectively, the foregoing are referred to herein as the “Current Court Orders”). The Current Court Orders have not previously been consolidated into a single document.

Except as specifically modified, amended, or supplemented by this 2021 Order, the Current Court Orders remain in full force and effect -- but if there is any ambiguity or if there are any conflicts of requirements, the terms of this 2021 Order shall prevail.

This 2021 Order is necessary for the public health because of EGLE’s revision of the generic state-wide residential and non-residential generic drinking water cleanup criteria for 1,4-dioxane in groundwater to 7.2 parts per billion (“ppb”)1 and 350 ppb, respectively, and of the generic groundwater-surface water interface cleanup criterion for 1,4-dioxane in groundwater to 280 ppb.

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1 Concentrations expressed as ug/L (micrograms per liter) are equivalent to ppb (parts per billion) in dilute aqueous solutions Therefore, those terms are used interchangeably.

Having conducted a hearing on this matter, having read the reports of experts for the several parties regarding the science behind and supporting Response Activities for the Site, and having heard the legal arguments of the parties regarding Response Activities for the Site, the Court has determined that the terms and conditions in this Order are necessary to address threats to human health and the environment posed by Defendant's 1,4-dioxane by supplementing and modifying the Remedial Actions and Response Activities required by the Current Court Orders, and are otherwise necessary and reasonable to protect the public interest.

NOW, THEREFORE, it is hereby ORDERED and ADJUDGED:

**I. JURISDICTION**

A. This Court has jurisdiction over the subject matter of this action. This Court also has personal jurisdiction over the Defendant.

B. This Court shall retain jurisdiction over the Parties and the subject matter of this action to enforce this Order and to resolve disputes arising under this Order.

**II. PARTIES BOUND**

This Order applies to Plaintiffs, Defendant, and Intervenors, and their successors.

**III. DEFINITIONS**

Whenever the terms listed below are used in this Order or the Attachments that are appended hereto, the following definitions shall apply:

A. "2021 Order" and "this Order" shall mean this Order Supplementing and Modifying Existing Court Orders and Existing Consent Judgment, As Amended Through Third

Amendment, and all Attachments appended hereto. All Attachments to this Order are incorporated herein and made enforceable parts of this Order.

B. “Day” shall mean a calendar day unless expressly stated to be a working day. “Working Day” shall mean a day other than a Saturday, Sunday, or a State legal holiday. In computing any period of time under this Order, where the last day would fall on a Saturday, Sunday, or State legal holiday, the period shall run until the end of the next working day.

C. “Defendant” shall mean Gelman Sciences Inc.

D. “1,4-dioxane” shall mean 1,4-dioxane released to or migrating from the Gelman Property. This term as it is used in this Order shall not include any 1,4-dioxane that Defendant establishes by a preponderance of the evidence to have originated from a release for which Defendant is not legally responsible, except to the extent that such 1,4-dioxane is commingled with 1,4-dioxane released to or migrating from the Gelman Property. Nothing in this Order shall preclude Defendant’s right to seek contribution or cost recovery from other parties responsible for such commingled 1,4-dioxane.

E. “Eastern Area” shall mean the part of the Site that is located east of Wagner Road, including the areas encompassed by the Prohibition Zone.

F. “EGLE” shall mean the Michigan Department of Environment, Great Lakes, and Energy, the successor to the Michigan Department of Environmental Quality, the Michigan Department of Natural Resources and Environment, the Michigan Department of Natural Resources, and the Water Resources Commission. Pursuant to Executive Order 2019-06, effective April 22, 2019, the Michigan Department of Environmental Quality was renamed the Michigan Department of Environment, Great Lakes, and Energy.

G. “Evergreen Subdivision Area” shall mean the residential subdivision generally located north of I-94 and between Wagner and Maple Roads, bounded on the west by Rose Street, on the north by Dexter Road, and on the south and east by Valley Drive.

H. “Gelman” shall mean Gelman Sciences Inc.

I. “Gelman Property” shall mean the real property described in Attachment A, where Defendant formerly operated a manufacturing facility in Scio Township, Michigan. The Defendant sold portions of the property and retains one parcel only for purposes of operating a water treatment system (the “Wagner Road Treatment Facility”).

J. “Generic GSI Criterion” shall mean the generic groundwater-surface water interface (“GSI”) cleanup criterion for 1,4-dioxane of 280 ppb established pursuant to MCL 324.20120e(1)(a).

K. “Groundwater Contamination” shall mean the 1,4-dioxane in the groundwater at a concentration in excess of 7.2 ppb, as determined by the analytical method(s) described in Attachment B to this Order, subject to review and approval by EGLE.

L. “Municipal Water Connection Contingency Plan” or “MWCCP” shall mean a contingency plan developed to identify the steps necessary to connect properties that rely on a private drinking water well to municipal water in the event those wells are threatened by 1,4-dioxane concentrations in excess of the applicable drinking water cleanup criterion and the estimated time necessary to implement each step of the water connection process.

M. “Part 201” shall mean Part 201 of the Natural Resources and Environmental Protection Act, MCL 324.20101, *et seq.*

N. “Parties” shall mean Plaintiffs and Defendant.



O. “Plaintiffs” shall mean the Attorney General of the State of Michigan *ex rel.*

EGLE.

P. “Prohibition Zone” or “PZ” shall mean the area that is subject to the institutional control established by the Prohibition Zone Order and this Order. A map depicting the Prohibition Zone established by this Order is attached as Attachment C.

Q. “Prohibition Zone Order” shall collectively mean the Court’s Order Prohibiting Groundwater Use, dated May 17, 2005, which established a judicial institutional control, and the March 8, 2011 Stipulated Order Amending Previous Remediation Orders, which incorporated the Prohibition Zone Order into this Order and applied the institutional control to the Expanded Prohibition Zone, as defined in the Third Amendment to Consent Judgment.

R. “PZ Boundary Wells” shall mean those wells on or near the boundary of the Prohibition Zone and designated in Section V.A.3.b herein, whose purpose is to detect movement of 1,4-dioxane near the Prohibition Zone boundary.

S. “Remedial Action” or “Remediation” shall mean removal, treatment, and proper disposal of Groundwater and Soil Contamination, land use or resource restrictions, and institutional controls, pursuant to the terms and conditions of this Order and work plans approved by EGLE under this Order.

T. “Response Activity” or “Response Activities” shall have the same meaning as that term is defined in Part 201, MCL 324.20101(vv).

U. “Sentinel Wells” shall mean those wells designated in Section V.A.3.a herein, whose purpose is to detect movement of 1,4-dioxane toward the Prohibition Zone boundary.

V. “Site” shall mean the Gelman Property and other areas affected by the migration of 1,4-dioxane emanating from the Gelman Property.

W. “Soil Contamination” or “Soil Contaminant” shall mean 1,4-dioxane in soil at a concentration in excess of 500 micrograms per kilogram (“ug/kg”), as determined by the analytical method(s) described in Attachment D or another higher concentration limit derived by means consistent with Mich Admin Code R 299.18 or MCL 324.20120a.

X. “Verification Process” shall mean the process through which Defendant shall test for and verify concentrations of 1,4-dioxane in excess of the applicable threshold at the relevant monitoring and drinking water wells, using the sampling and analytical method(s) described in Attachment B to this Order. Specifically, Defendant shall sample the wells on a quarterly basis unless an alternative schedule is agreed upon with EGLE. Groundwater samples will be analyzed for 1,4-dioxane, either by Defendant’s laboratory or a third-party laboratory retained by Defendant. In the event that 1,4-dioxane concentrations in groundwater sampled from any well exceed the applicable threshold, Defendant shall notify EGLE by phone or electronic mail within 48 hours of completion of the data verification and validation specified in the Quality Assurance Project Plan (“QAPP”) described in Section V.E. Defendant will resample the same well within five days after the data verification and validation of the original result or at a time agreed upon with EGLE, if EGLE opts to take split samples. If a second sample analyzed by Defendant’s laboratory or a third-party laboratory retained by Defendant has contaminant concentrations exceeding the applicable threshold, the exceedance will be considered verified and Defendant shall undertake the required Response Activities.

In the event that EGLE opts to take split samples, Defendant shall also collect an additional split sample for potential analysis within the applicable holding time by a mutually agreed-upon third-party laboratory at Defendant’s expense. If the results from one sample, but not both, confirm a verified exceedance, the third sample analyzed by the mutually agreed-upon

third-party laboratory, using the sampling and analytical method(s) described in Attachment B to this Order, shall serve as the relevant result for verification purposes.

Y. “Western Area” shall mean that part of the Site located west of Wagner Road.

#### **IV. IMPLEMENTATION OF RESPONSE ACTIVITIES AND REMEDIAL ACTIONS BY DEFENDANT**

Defendant shall implement the Response Activities and Remedial Action to address Groundwater and Soil Contamination at, and emanating from, the Gelman Property in accordance with (1) the terms and conditions of this Order; and (2) work plans approved by EGLE pursuant to this Order. Notwithstanding any requirements set forth in this Order obligating Defendant to operate remedial systems on a continuous basis, at a minimum rate, or until certain circumstances occur, Defendant may temporarily reduce or shut-down such remedial systems for reasonably necessary maintenance according to EGLE-approved operation and maintenance plans.

#### **V. GROUNDWATER REMEDIATION**

Defendant shall design, install, operate, and maintain the systems described below to satisfy the objectives described below. Defendant also shall implement a monitoring program to verify the effectiveness of these systems.

A. Eastern Area

1. Objectives. The remedial objectives of the Eastern Area (“Eastern Area Objectives”) shall be the following:

a. **Prohibition Zone Containment Objective.** Defendant shall prevent Groundwater Contamination, regardless of the aquifer designation or the depth of the groundwater or Groundwater Contamination, from migrating beyond the boundaries of the Prohibition Zone as may be amended pursuant to Section V.A.2.f. Compliance with the Prohibition Zone Containment Objective shall be determined as provided in Section V.A.4.b, below.

b. **Groundwater-Surface Water Interface Objective.** Defendant shall prevent 1,4-dioxane from venting into surface waters in the Eastern Area at concentrations above the Generic GSI Cleanup Criterion, except in compliance with Part 201, including MCL 324.20120e (“Groundwater-Surface Water Interface Objective” for the Eastern Area).

2. **Prohibition Zone Institutional Control.** Pursuant to MCL 324.20121(8) and the Prohibition Zone Order, the following land and resource use restrictions shall apply to the Prohibition Zone depicted on the map attached hereto as Attachment C:

a. The installation by any person of a new water supply well in the Prohibition Zone for drinking, irrigation, commercial, or industrial use is prohibited.

b. The Washtenaw County Health Officer or any other entity authorized to issue well construction permits shall not issue a well construction permit for any well in the Prohibition Zone.

c. The consumption or use by any person of groundwater from the Prohibition Zone is prohibited.

d. The prohibitions listed in Subsections V.A.2.a–c do not apply to the installation and use of:

i. Groundwater extraction and monitoring wells as part of Response Activities approved by EGLE or otherwise authorized under Parts 201 or 213 of the Natural Resources and Environmental Protection Act (“NREPA”), or other legal authority;

ii. Dewatering wells for lawful construction or maintenance activities, provided that appropriate measures are taken to prevent unacceptable human or environmental exposures to hazardous substances and comply with MCL 324.20107a;

iii. Wells supplying heat pump systems that either operate in a closed loop system or if not, are demonstrated to operate in a manner sufficient to prevent unacceptable human or environmental exposures to hazardous substances and comply with MCL 324.20107a;

iv. Emergency measures necessary to protect public health, safety, welfare or the environment;

v. Any existing water supply well that has been demonstrated, on a case-by-case basis and with the written approval of EGLE, to draw water from a formation that is not likely to become contaminated with 1,4-dioxane emanating from the Gelman Property. Such wells shall be monitored for 1,4-dioxane by Defendant at a frequency determined by EGLE; and

vi. The City of Ann Arbor’s Northwest Supply Well, provided that the City of Ann Arbor operates the Northwest Supply Well in a manner that does not prevent its municipal water supply system from complying with all applicable state and federal laws and regulations.

e. Attachment E (consisting of the map depicting the Prohibition Zone and the above list of prohibitions/exceptions) shall be published and maintained in the

same manner as a zoning ordinance at Defendant's sole expense. which may be accomplished by the City of Ann Arbor maintaining a hyperlink on its public webpage that includes the City of Ann Arbor zoning maps, or another appropriate webpage, that directs the visitor to the portion of EGLE's Gelman Sciences website that identifies the extent of the Prohibition Zone and the Summary of Restrictions. EGLE-approved legal notice of the Prohibition Zone expansion reflected in Attachment F shall be provided at Defendant's sole expense.

f. The Prohibition Zone Institutional Control shall remain in effect in this form until such time as it is modified through amendment of this Order, with a minimum of 30 days' prior notice to all Parties. The Defendant or EGLE may move to amend this Order to modify the boundaries of the Prohibition Zone to reflect material changes in the boundaries or fate and transport of the Groundwater Contamination as determined by future hydrogeological investigations or EGLE-approved monitoring of the fate and transport of the Groundwater Contamination. The dispute resolution procedures of Section XVI shall not apply to such motion. Rather, the Prohibition Zone boundary may not be expanded unless the moving Party demonstrates by clear and convincing evidence that there are compelling reasons that the proposed expansion is needed to prevent an unacceptable risk to human health. The above-described showing shall not apply to a motion if the Prohibition Zone expansion being sought arises from or is related to: (1) inclusion of the Triangle Property under the following subsection; (2) the incorporation of a more restrictive definition of Groundwater Contamination (i.e., a criterion less than 7.2 ppb) into this Order; or (3) expansion under V.A.6.c up to and including back to the boundary established by this Order.

g. Future Inclusion of Triangle Property in the Prohibition Zone. The triangular piece of property located along Dexter Road/M-14 ("Triangle Property"), depicted in

Attachment C, will be included in the Prohibition Zone if the data obtained from monitoring wells MW-121s and MW-121d and other nearby wells, including any water supply well installed on the property, as validated by the Verification Process, indicate that the Groundwater Contamination has migrated to the Triangle Property.

h. **Well Identification.** To identify any wells newly included in the Prohibition Zone as a result of this modification or any future modification to the Prohibition Zone, pursuant to an EGLE-approved schedule, Defendant shall implement a well identification plan for the affected area that is consistent with the Expanded Prohibition Zone Well Identification Work Plan approved by EGLE on February 4, 2011.

i. **Plugging of Private Water Wells.** Defendant shall plug and replace any private drinking water wells identified in any areas newly included in the Prohibition Zone by connecting those properties to the municipal water supply. Unless otherwise approved by EGLE, Defendant shall also properly plug non-drinking water wells in any areas newly included in the Prohibition Zone.

j. **Municipal Water Connection Contingency Plan (“MWCCP”).** Defendant shall develop a MWCCP addressing the potential provision of municipal water to properties using private drinking water wells in the Calvin Street, Wagner Road, and Lakeview Avenue areas. The MWCCP will be developed according to a schedule to be approved by EGLE.

3. **Monitoring and Extraction Well Installation and Operation.** Defendant shall install the following additional wells in the Eastern Area according to a schedule approved by EGLE and subject to access and receipt of any required approvals pursuant to Section VII.D:

a. Sentinel Well Installation. Defendant shall install the following three monitoring well clusters to monitor movement of 1,4-dioxane south of the northern Prohibition Zone boundary, in addition to MW-120, MW-123, and MW-129 that are already in place (collectively referred to herein as “Sentinel Wells”):

- i. Residential area in the general vicinity of Ravenwood and Barber Avenues (Location “A” on map attached as Attachment G);
- ii. Residential area in the general vicinity of Sequoia Parkway and Archwood Avenues between Delwood and Center (Location “B” on map attached as Attachment G); and
- iii. Residential area in the general vicinity of Maple Road and North Circle Drive (Location “C” on the map attached as Attachment G).
- iv. Residential area roughly half way between locations of MW-133 and MW-121 (Location “AA” on the map attached as Attachment G);
- v. Residential area, near the northeast PZ boundary, between MW-135 and MW-97 (Location “BB” on the map attached as Attachment G);
- vi. Residential area north of Location C (Location “DD” on the map attached as Attachment G);
- vii. Residential area north of Location C (Location “EE” on the map attached as Attachment G); and



viii. Residential area north of Location C (Location “FF” on the map attached as Attachment G).

b. PZ Boundary Well Installation. Defendant shall install the following two monitoring well clusters to monitor the movement of 1,4-dioxane near the PZ Boundary (collectively referred to herein as “PZ Boundary Wells”):

- i. Residential, commercial, and vacant area east of South Wagner Road, north of West Liberty Road, west of Lakeview Avenue, and south of Second Sister Lake (Location “D” on map attached as Attachment G); and
- ii. Residential area south/southeast of the MW-112 cluster (Location “E” on map attached as Attachment G).

c. Sentinel and PZ Boundary Well Installation and Sampling.

Defendant shall install the new well clusters according to a schedule to be approved by EGLE. Each new Sentinel or PZ Boundary Well cluster will include two to three monitoring wells, and the determination of the number of wells shall be based on EGLE’s and the Defendant’s evaluation of the geologic conditions present at each location, consistent with past practice. The frequency of sampling these monitoring wells and the analytical methodology for sample analysis will be included in the Eastern Area System Monitoring Plan, as amended.

d. Drilling Techniques. Borings for new wells installed pursuant to Section V.A.3 shall be drilled to bedrock unless a different depth is approved by EGLE or if conditions make such installation impracticable. EGLE reserves the right to require alternate

drilling techniques to reach bedrock if standard methods are not able to do so. If the Defendant believes that drilling one or more of these wells to bedrock is not practical due to the geologic conditions encountered and/or that such conditions do not warrant the alternative drilling technique required by EGLE, Defendant may initiate dispute resolution under Section XVI of this Order. The wells shall be installed using Defendant's current vertical profiling techniques, which are designed to minimize the amount of water introduced during drilling, unless EGLE agrees to alternate techniques. Any material excavated as the result of well installation shall be properly characterized and disposed of or transferred to an appropriate facility for preservation and future scientific investigation, at Defendant's discretion.

e. Installation of Additional Groundwater Extraction Wells.

i. Defendant shall install an additional groundwater extraction well (the "Rose Well") and associated infrastructure in the general area bounded by Rose Street and Pinewood Street as designated on Attachment G or convert former injection well IW-2 to a groundwater extraction well, or both. The decision to install the Rose Well or to convert IW-2 to an extraction well (or to do both) and exact location of the Rose Well if installed will be based on an evaluation of relevant geologic conditions, water quality, and other relevant factors, including access.

ii. Subject to V.A.3.g., below, Defendant shall install an additional groundwater extraction well (the "Parklake Well") and associated infrastructure in the parcel owned by the City of Ann Arbor bounded by Parklake Avenue and Jackson Road as designated on Attachment G (the "City of Ann Arbor-owned parcel"). The exact location of the Parklake Well within the City of Ann Arbor-owned parcel will be based on an evaluation of relevant geologic conditions, water quality, and other relevant factors, including access. Terms

of access to the City of Ann Arbor-owned parcel shall be governed by an access or license agreement between Defendant and the City of Ann Arbor and Defendant's obligation to install and operate the Parklake Well shall be conditioned on negotiation of a mutually acceptable agreement with the City of Ann Arbor.

f. Eastern Area Groundwater Extraction.

i. The Defendant shall operate the Evergreen Subdivision Area extraction wells, LB-4 and either the Rose Well or IW-2, or both (including EGLE-approved replacement well(s)) (collectively, the "Evergreen Wells"), and TW-19 and TW-23 (or EGLE-approved replacement well(s)) (the "Maple Road Wells"), at a combined minimum purge rate of approximately 200 gallons per minute ("gpm") or the maximum capacity of the existing deep transmission pipeline, whichever is less provided Defendant properly maintains the pipeline, in order to reduce the mass of 1,4-dioxane migrating through the Evergreen Subdivision Area and the mass of 1,4-dioxane migrating east of Maple Road, until such time as the Eastern Area Objectives will be met at a reduced extraction rate or without the need to operate these extraction wells. In the event the maximum capacity of the existing deep transmission pipeline is ever reduced to below 180 gpm, Defendant shall repair and/or reconfigure the pipeline and related infrastructure, or take other action, including potentially replacing the pipeline or treating and disposing of some portion of the extracted groundwater at a different location, as needed to once again achieve a capacity of 190 – 200 gpm. Defendant shall have the discretion to adjust the individual well purge rates in order to optimize mass removal and compliance with the Eastern Area Objectives, provided that it shall operate the Evergreen Wells at a combined minimum purge rate of approximately 100 gpm, until such time as the Eastern Area Objectives will be met at a reduced extraction rate without the need to operate these wells. Before

significantly reducing extraction below the minimum purge rates described above or permanently terminating extraction from either the Evergreen Wells or the Maple Road Wells, Defendant shall consult with EGLE and provide a written analysis, together with the data that supports its conclusion that the Eastern Area Objectives can be met at a reduced extraction rate or without the need to operate these extraction wells. EGLE will review the analysis and data and provide a written response to Defendant within 56 days after receiving Defendant's written analysis and data. If Defendant disagrees with the EGLE's conclusion, Defendant may initiate dispute resolution under Section XVI of this Order. The Defendant shall not significantly reduce or terminate extraction from the Evergreen Wells or the Maple Road Wells during the 56-day review period or while Defendant is disputing EGLE's conclusion.

ii. Defendant shall operate the Parklake Well, at a purge rate of approximately 200 gpm, subject to the yield of the aquifer in that area and discharge volume restrictions imposed in connection with the method of water disposal including discharge restrictions during wet weather events, in order to reduce the mass of 1,4-dioxane migrating from that area. Purged groundwater from the Parklake Well shall be treated with ozone/hydrogen peroxide or ultraviolet light and oxidizing agents at the City Ann Arbor-owned parcel. Defendant shall operate this extraction and treatment system until effluent 1,4-dioxane concentrations indicate continued extraction will no longer contribute to beneficial reduction in 1,4-dioxane mass. Before seeking to terminate or significantly reduce extraction, Defendant shall cycle the Parklake Well off and on for several periods of time approved by EGLE to demonstrate that significant concentration rebound is not occurring. Defendant shall not permanently terminate extraction and treatment of water from the Parklake Well before the second anniversary of the date extraction was commenced. Before significantly reducing or terminating

extraction from the Parklake Well (beyond the discharge volume restrictions/variations arising from the approved discharge option/above-described cycling), Defendant shall consult with EGLE and provide a written analysis, together with the data that supports its conclusion that the foregoing conditions have been satisfied. EGLE will review the analysis and data and provide a written response to Defendant within 56 days after receiving Defendant's written analysis and data. If Defendant disagrees with EGLE's conclusion, Defendant may initiate dispute resolution under Section XVI of this Order. The Defendant shall not significantly reduce or terminate extraction from the Parklake Well during the 56-day review period or while Defendant is disputing EGLE's conclusion.

g. Transport and discharge/disposal of treated Parklake Well water.

i. Unless EGLE approves an alternative that satisfies g. ii, below, after groundwater extracted by the Parklake Well is properly treated with ozone/hydrogen peroxide technology, Gelman shall transport the treated water through a pipeline to the Gelman Property where it shall be discharged from Gelman's existing permitted discharge outfall, in accordance with the terms of its existing permit (as same may be amended or replaced). Gelman shall obtain any permits or amendments to permits necessary to authorize such discharge. Gelman shall obtain all necessary permits or authorizations from all applicable state or local governmental authorities necessary to install, maintain and operate a pipeline to transport the treated water from the Parklake Well treatment system to the Gelman Property. Gelman shall install, maintain and operate the pipeline at its sole cost.

ii. Subject to EGLE approval, Gelman may propose and implement alternative means or methods to discharge or dispose of water from the Parklake Well (following treatment with ozone/hydrogen peroxide technology), in lieu of the pipeline described in g.i.,

above. Such an alternative may be approved and permitted by EGLE only if Gelman demonstrates that the alternative will have no adverse impacts or consequences to human health or the environment.

4. Verification Monitoring. Defendant shall amend its Eastern Area System Monitoring Plan dated December 22, 2011 to include the monitoring wells installed under Section V.A.3 within 60 days of their installation. The Eastern Area System Monitoring Plan, as amended (hereinafter the “Verification Plan”), shall be sufficient to meet the objectives of this Section.

a. Objectives of Verification Plan. The Verification Plan shall include the collection of data sufficient to measure the effectiveness of the Remediation and to:

- (i) ensure that any potential migration of Groundwater Contamination outside of the Prohibition Zone is detected before such migration occurs and with sufficient time to allow Defendant to maintain compliance with the Prohibition Zone Containment Objective;
- (ii) verify that the Groundwater-Surface Water Interface Objective is satisfied;
- (iii) track the migration of the Groundwater Contamination to determine the need for additional investigation and monitoring points to meet the objectives in Section V.A.1, including the determination of the fate and transport of Groundwater Contamination when and if it reaches the Allen Creek Drain (including its branches) and the portion of the Huron River that is the easternmost extent of the Prohibition Zone; and
- (iv) evaluate potential changes in groundwater flow resulting from adjustments in extraction rates at different extraction well locations.

The Verification Plan shall be continued until terminated pursuant to Section V.D.

b. Compliance Determination. The Verification Plan shall include the following steps for verifying sampling results and confirming compliance or noncompliance with the Eastern Area Objectives.

i. Verification Process for Sentinel Wells. Defendant shall conduct the Verification Process as defined in Section III.X for each Sentinel Well to verify any exceedance of 7.2 ppb. A verified detection above 7.2 ppb will be considered a “Verified Sentinel Well Exceedance” and Defendant shall take the Response Activities set forth in Section V.A.5.a.

ii. Verification Process for PZ Boundary Wells. Defendant shall conduct the Verification Process as defined in Section III.X for each PZ Boundary Well to verify any exceedance of 4.6 ppb and/or 7.2 ppb. A verified detection above 4.6 ppb will be considered a “Verified PZ Boundary Well Exceedance” and Defendant shall take the Response Activities set forth in Section V.5.b. A verified detection above 7.2 ppb will be considered a “Confirmed PZ Boundary Well Noncompliance” and Defendant shall take the Response Activities set forth in Section V.5.c.

5. Eastern Area Response Activities. Defendant shall take the following Response Activities:

a. Verified Sentinel Well Exceedance. In the event of a Verified Sentinel Well Exceedance, Defendant shall sample that Sentinel Well monthly. If the concentrations of 1,4-dioxane are less than 7.2 ppb in samples from any two successive monthly sampling events, Defendant shall return to sampling that Sentinel Well quarterly. If, however, the concentrations of 1,4-dioxane exceed 7.2 ppb in samples collected from the same Sentinel

Well in any three successive monthly sampling events, Defendant shall take the following actions:

i. If involving a Sentinel Well in the north, installation of up to two additional well clusters near the Prohibition Zone boundary (the location of which shall be determined based on the location of the initial exceedance). If more than one Sentinel Well in the north exceeds the trigger level, Defendant and EGLE will mutually agree on the number of PZ Boundary Wells to be installed. Defendant shall sample the new PZ Boundary Wells monthly until Defendant completes the hydrogeological assessment described in Section V.A.5.a.ii below.

ii. Completion of a focused hydrogeological assessment of the applicable area that analyzes the likelihood that 1,4-dioxane at levels above 7.2 ppb will migrate outside the Prohibition Zone. The assessment shall also opine on the mechanism causing the exceedances and the potential risk of impact to private drinking water wells. Defendant shall provide this assessment to EGLE within 60 days after installation of the new PZ Boundary Well(s). If the focused hydrogeological assessment determines that there is a low potential for the Groundwater Contamination to migrate beyond the Prohibition Zone boundary, normal quarterly monitoring of the Sentinel Well and applicable PZ Boundary Wells will resume. If the focused hydrogeological assessment determines that there is a reasonable likelihood for 1,4-dioxane greater than 7.2 ppb to migrate beyond the Prohibition Zone boundary, the Defendant shall initiate the following Response Activities:

(A) Defendant shall continue to monitor the affected Sentinel Well(s) and the Prohibition Zone Boundary Wells on a monthly basis.



(B) If the Verified Sentinel Well Exceedance occurs in a Sentinel Well to be installed near the northern boundary of the Prohibition Zone, Defendant shall develop a “Remedial Contingency Plan” that identifies the Response Activities that could be implemented to prevent Groundwater Contamination from migrating beyond the Prohibition Zone Boundary. The Remedial Contingency Plan may identify expansion of the Prohibition Zone as an option, subject to Section V.A.2.f. Defendant shall submit the Remedial Contingency Plan to EGLE within 45 days after the focused hydrogeological assessment is completed.

(C) Defendant will review the Municipal Water Connection Contingency Plan, if applicable, and initiate preliminary activities related to provision of municipal water to potentially impacted private drinking water wells. The amount of work to be completed will be based on the anticipated time frame for water extension and the projected time of migration to potential receptors.

b. Verified PZ Boundary Well Exceedance. In the event of a Verified PZ Boundary Well Exceedance, Defendant shall sample that PZ Boundary Well monthly. If the concentrations of 1,4-dioxane are less than 4.6 ppb in samples from any two successive monthly sampling events, Defendant shall return to sampling that PZ Boundary Well quarterly. If, however, the concentrations of 1,4-dioxane exceed 4.6 ppb in samples collected from the same PZ Boundary Well in any three successive monthly sampling events, Defendant shall take the following actions:

i. Defendant, in consultation with EGLE, shall sample select private drinking water wells in the immediate vicinity of the impacted PZ Boundary Well.

ii. Defendant will review the Municipal Water Connection Contingency Plan, and initiate further activities related to potential provision of municipal water

to potentially impacted private drinking water wells as appropriate. The amount of work to be completed will be based on the anticipated time frames for water extension and the projected time of migration to potential receptors.

iii. Subject to Section V.A.2.f, Defendant shall implement the Remedial Contingency Plan as necessary to prevent contaminant levels above 7.2 ppb from migrating beyond the Prohibition Zone Boundary.

c. Confirmed PZ Boundary Well Noncompliance. In the event of a Confirmed PZ Boundary Well Noncompliance, Defendant shall sample that PZ Boundary Well monthly. If the concentrations of 1,4-dioxane are less than 7.2 ppb in samples from any two successive monthly sampling events, Defendant shall return to sampling that PZ Boundary Well quarterly. If, however, the concentrations of 1,4-dioxane exceed 7.2 ppb in samples collected from the same PZ Boundary Well in any four successive monthly sampling events, Defendant shall take the following actions:

i. Defendant shall sample any active drinking water wells in the immediate vicinity of the impacted PZ Boundary Well on a monthly basis.

ii. Defendant will review the Municipal Water Connection Contingency Plan and implement the remaining activities necessary to provide municipal water to properties serviced by private drinking water wells potentially impacted by 1,4-dioxane concentrations above the applicable drinking water cleanup criterion.

iii. Defendant shall connect any such properties to municipal water on a case-by-case basis as determined by EGLE or if requested by the property owner.

iv. Subject to Section V.A.2.f, Defendant shall undertake Response Actions as necessary to reduce concentrations in the affected PZ Boundary Well(s) to less than 7.2 ppb.

d. Bottled Water. At any time, Defendant shall supply the occupants of any property with a threatened drinking water well with bottled water if, prior to connection to municipal water, 1,4-dioxane concentrations in the drinking water well servicing the property exceed 3.0 ppb. This obligation shall terminate if either (i) the 1,4-dioxane concentration in the well drops below 3.0 ppb during two consecutive sampling events or (ii) the property is connected to an alternative water supply.

e. Triangle Property. If a drinking water well is installed on the Triangle Property in the future, Defendant shall take the necessary steps to obtain permission to sample the well on a schedule approved by EGLE. Defendant shall monitor such well(s) on EGLE-approved schedule unless or until that property is included in the Prohibition Zone, at which time, any water well(s) shall be addressed as part of the well identification process described in Section V.A.2.h.

f. Downgradient Investigation. The Defendant shall continue to implement its Downgradient Investigation Work Plan as approved by EGLE on February 4, 2005, as may be amended, to track the Groundwater Contamination as it migrates to ensure any potential migration of Groundwater Contamination outside of the Prohibition Zone is detected before such migration occurs with sufficient time to allow Defendant to maintain compliance with the Prohibition Zone Containment Objective and to ensure compliance with the Groundwater-Surface Water Interface Objective. Defendant shall, as the next phase of this iterative investigation process investigate the area depicted on the map attached as Attachment

G, including the installation of monitoring wells at the following locations subject to access and receipt of any required approvals pursuant to Section VII.D:

- i. A monitoring well nest in the residential area in the general vicinity of intersection of Washington and 7<sup>th</sup> Streets (Location “F” on Attachment G);
- ii. A shallow well in the residential area in the general vicinity of current monitoring well nest MW-98 (Location “G” on Attachment G); and
- iii. A monitoring well nest in the residential area in the general vicinity of Brierwood and Linwood Streets (Location “H” on Attachment G).
- iv. A monitoring well nest in the residential area in the general vicinity south of MW-82s (Location “GG” on Attachment G); and
- v. A monitoring well nest in the residential area (Location “HH” on Attachment G);
- vi. Install and sample two sets of temporary transect borings set in a roughly N-S line, each boring placed with approximately 200 foot lateral spacing, with groundwater samples to be taken at 10 foot vertical intervals in each boring down to bedrock, with samples to be analyzed for 1,4-dioxane concentrations. The lines of transect borings to be located as follows:

- a. Line 1 – along Maple Road, from Dexter Road to Miller Road (with Location as depicted on Attachment G); and
  - b. Line 2 – along Glendale-Grandview-Westwood Streets, near MW-82s (with Location as depicted on Attachment G); and
- vii. Install and sample temporary transect borings on both sides of and closely adjacent to the South Branch of the Allen Creek Drain, with each boring placed with approximately 100 foot lateral spacing, with groundwater samples to be taken at 5 foot vertical intervals in each boring down to 10 feet below the base of the drain, with samples to be analyzed for 1,4-dioxane concentrations. (with Location as depicted on Attachment G). Results of the foregoing shallow groundwater profiling will be used to install a minimum of three shallow groundwater monitoring well nests along each side of the Allen Creek Drain where the presence of groundwater at or above GSI concentrations has been delineated. Each monitoring location should include at least two monitoring wells screened at the equivalent depth of the drain and 5 feet deeper so that a vertical hydraulic gradient can be determined.
- viii. The data from these wells will be used to guide additional

downgradient investigations as necessary to ensure compliance with the Eastern Area Objectives.

g. Exceedance of GSI Criteria in Surface Water.

Pursuant to V.A.11., if sampling of any of the surface water bodies or drainage systems (with the exception of Third Sister Lake and the South Branch of the Allen Creek Drain downgradient of Maryfield-Wildwood Park) detects the presence of 1,4-dioxane at a concentration greater than 7 ppb, then, within 60 days of receiving such a sampling result, Defendant shall investigate and submit a report to EGLE containing at least the following information: (1) a determination of where and how 1,4-dioxane is likely entering the affected water body; (2) an assessment of the risk that the GSI Cleanup Criterion will be exceeded in the affected water body; (3) proposed Response Activities for preventing 1,4-dioxane from entering the affected water body in a concentration greater than the GSI Cleanup Criterion; and (4) an assessment of the risk that 1,4-dioxane from the affected water body could migrate to groundwater. After receipt and review of Defendant's report, EGLE may require Defendant to undertake additional Response Activities to address the sampling result, including, but not limited to, the installation of additional monitoring wells.

6. Prohibition Zone Boundary Review.

a. Five years after entry of this Order and then every five years thereafter, Defendant and EGLE shall confer and determine whether the boundary of the Prohibition Zone can be contracted without either: (i) posing a current or future risk to the public health and welfare, including maintaining an adequate distance between the Groundwater Contamination and the Prohibition Zone boundary; or (ii) requiring Defendant to undertake additional Response Activities to contain the Groundwater Contamination within the contracted

Prohibition Zone boundary beyond those Response Activities otherwise required immediately before the proposed contraction. This determination will be based on consideration of the totality of all data from existing Eastern Area monitoring wells.

b. If EGLE and Defendant jointly agree that the Prohibition Zone boundary may be contracted under these conditions, the Parties shall move to amend Attachments C and E of this Order for the sole purpose of establishing a revised boundary for the Prohibition Zone. If only one Party concludes that the Prohibition Zone boundary may be contracted under these conditions, that Party may move to amend Attachments C and E of this Order for the sole purpose of establishing a revised boundary for the Prohibition Zone, but must demonstrate by clear and convincing evidence that the above conditions are satisfied. The non-moving Party may oppose or otherwise respond to such motion and the showing required under Section XVI shall not apply to the Court's resolution of the motion.

c. If the Prohibition Zone boundary is contracted under Section V.A.6 and the Parties, either jointly or independently, subsequently determine that based on the totality of the data, the Prohibition Zone boundary should be expanded up to and including back to the boundary established by this Order in order to protect the public health and welfare, the Party(ies) may move to amend Attachments C and E of this Order for the sole purpose of establishing a revised boundary for the Prohibition Zone. Neither Section XVI nor the showing required under Section V.A.2.f shall apply to the Court's resolution of the motion, provided that the expansion sought does not extend beyond the boundary established by this Order.

d. To the extent the Prohibition Zone boundary is contracted under Section V.A.6.a, Defendant shall not be required to undertake Response Activities to contain the

Groundwater Contamination within the contracted boundary beyond those Response Activities required immediately before the Prohibition Zone was contracted.

7. Operation and Maintenance. Subject to Sections V.A.3.f, V.A.9, and reasonably necessary maintenance according to EGLE-approved operation and maintenance plans, Defendant shall operate and maintain the Eastern Area System as necessary to meet the Prohibition Zone Containment Objective until Defendant is authorized to terminate extraction well operations pursuant to Section V.C.1.

8. Treatment and Disposal. Groundwater extracted by the extraction well(s) in the Eastern Area System shall be treated (as necessary depending on the disposal method(s) utilized) with ozone/hydrogen peroxide or ultraviolet light and oxidizing agent(s), or such other method approved by EGLE to reduce 1,4-dioxane concentrations to the required level and disposed of using methods approved by EGLE, including, but not limited to, the following options:

a. Groundwater Discharge. The purged groundwater shall be treated to reduce 1,4-dioxane concentrations to the level required by EGLE, and discharged to groundwater at locations approved by EGLE in compliance with a permit or exemption authorizing such discharge.

b. Sanitary Sewer Discharge. Use of the sanitary sewer leading to the Ann Arbor Wastewater Treatment Plant is conditioned upon approval of the City of Ann Arbor. If discharge is made to the sanitary sewer, the Evergreen and Maple Road Wells shall be operated and monitored in compliance with the terms and conditions of an Industrial User's Permit from the City of Ann Arbor, and any subsequent written amendment of that permit made by the City of Ann Arbor. The terms and conditions of any such permit and any subsequent



amendment shall be directly enforceable by EGLE against Defendant as requirements of this Order.

c. Storm Sewer Discharge. Use of the storm drain or sewer is conditioned upon issuance of an NPDES permit and approval of the appropriate regulatory authority(ies). Discharge to the Huron River via a storm water system shall be in accordance with the relevant NPDES permit and conditions required by the relevant regulatory authority(ies). If a storm drain or sewer is to be used for disposal of purged groundwater, Defendant shall submit to EGLE and the appropriate local regulatory authority(ies) for their review and approval, a protocol under which the purge system shall be temporarily shut down: (i) for maintenance of the storm drain or sewer and (ii) during storm events to assure that the storm water system retains adequate capacity to handle run-off created during such events. Defendant shall not be permitted or be under any obligation under this subsection to discharge purged groundwater to the storm drain or sewer unless the protocol for temporary shutdown is approved by all necessary authorities. Following approval of the protocol, the purge system shall be operated in accordance with the approved protocol.

d. Existing or Additional/Replacement Pipeline to Wagner Road Treatment Facility.

i. The existing deep transmission pipeline, an additional pipeline, or a pipeline replacing the existing deep transmission pipeline may be used to convey purged groundwater from the existing Evergreen Area infrastructure to the Wagner Road Treatment Facility where the purged groundwater shall be treated to reduce 1,4-dioxane concentrations to the level required by NPDES Permit No. MI-0048453, as amended or reissued.

ii. Installation of an additional pipeline or a replacement pipeline from the existing Evergreen Area to the Wagner Road Treatment Facility is conditioned upon approval of such installation by EGLE. If the pipeline is proposed to be installed on public property, the pipeline installation is conditioned upon approval of such installation by the appropriate local authority(ies), if required by statute or ordinance, or by Order of the Court pursuant to the authority under MCL 324.20135a. Defendant shall design and install the pipeline in compliance with all state requirements and install the pipeline with monitoring devices to detect any leaks. If leaks are detected, the system will automatically shut down and notify an operator of the condition. In the event that any leakage is detected, Defendant shall take any measures necessary to repair any leaks and perform any remediation that may be necessary. To reduce the possibility of accidental damage to the pipeline during any future construction, Defendant shall participate in the notification system provided by MISS DIG Systems, Inc., or its successor (“MISS DIG”), and shall comply with the provisions of MCL 460.721, *et seq.*, as may be amended and with the regulations promulgated thereunder. Defendant shall properly mark its facilities upon notice from MISS DIG.

e. Existing, Replacement, or Additional Pipeline from Maple Road Extraction Well(s). Defendant may operate the existing pipeline or install and operate a replacement pipeline or an additional pipeline from the Maple Road Extraction Well(s) to the existing Evergreen area infrastructure to convey groundwater extracted from the Maple Road Extraction Wells to the Wagner Road Treatment Facility, where the purged groundwater shall be treated to reduce 1,4-dioxane concentrations to the level required by NPDES Permit No. MI-0048453, as amended or reissued. Installation and operation of an additional or replacement pipeline from the Maple Road area to Evergreen area is conditioned upon approval of such

installation and operation by EGLE. If the pipeline is proposed to be installed on public property, the pipeline installation is conditioned upon approval of such installation by the appropriate local authorities, if required by statute or ordinance, or Order of the Court pursuant to the authority under MCL 324.20135a. Defendant shall design any such pipeline in compliance with all state requirements and install it with monitoring devices to detect any leaks. In the event any leakage is detected, Defendant shall take any measures necessary to repair any leaks and perform any remediation that may be necessary. To reduce the possibility of accidental damage to the pipeline, Defendant shall participate in the notification system provided by MISS DIG and shall comply with the provisions of MCL 460.721, *et seq.*, as may be amended, and with the regulations promulgated thereunder. Defendant shall properly mark its facilities upon notice from MISS DIG.

f. Pipeline from Rose Well. Installation and operation of a proposed pipeline from the Rose Well to the existing Evergreen area infrastructure is conditioned upon approval of such installation and operation by EGLE. If the pipeline is proposed to be installed on public property, the pipeline installation is conditioned upon approval of such installation by the appropriate local authorities, if required by statute or ordinance, or Order of the Court pursuant to the authority under MCL 324.20135a. Defendant shall design and install any such pipeline in compliance with all state requirements and install it with monitoring devices to detect any leaks. In the event any leakage is detected, Defendant shall take any measures necessary to repair any leaks and perform any remediation that may be necessary. To reduce the possibility of accidental damage to the pipeline, Defendant shall participate in the notification system provided by MISS DIG and shall comply with the provisions of MCL 460.721, *et seq.*, as may be amended, and with the regulations promulgated thereunder. Defendant shall properly mark its

facilities upon notice from MISS DIG. Defendant may operate such pipeline to, among other things, convey groundwater extracted from the Rose Well to the existing Evergreen Area infrastructure and then to the Wagner Road Treatment Facility, where the purged groundwater shall be treated to reduce 1,4-dioxane concentrations to the level required by NPDES Permit No. MI-0048453, as amended or reissued.

g. Transport and discharge/disposal of treated Parklake Well water shall occur as specified in section V.A.3.g.

9. Wagner Road Extraction. The extraction wells currently or in the future located just west of Wagner Road (the “Wagner Road Wells”) shall be considered part of the Eastern Area System even though they are located west of Wagner Road. The Defendant shall initially operate the Wagner Road Wells at a combined 200 gpm extraction rate. The Defendant shall continue to operate the Wagner Road Wells in order to reduce the migration of 1,4-dioxane east of Wagner Road at this rate until such time as the Eastern Area Objectives will be met with a lower combined extraction rate or without the need to operate these wells or that reduction of the Wagner Road extraction rate would enhance 1,4-dioxane mass removal from the Parklake Well and/or the Rose Well/IW-2 and Defendant’s efforts to reduce the mass of 1,4-dioxane migrating east of Maple Road and/or through the Evergreen Subdivision Area. Before significantly reducing or terminating extraction from the Wagner Road Wells, Defendant shall consult with EGLE and provide a written analysis, together with the data that supports its conclusion that the above-objectives can be met at a reduced extraction rate or without the need to operate these extraction wells. EGLE will review the analysis and data and provide a written response to Defendants within 56 days after receiving Defendant’s written analysis and data. If Defendant disagrees with EGLE’s conclusion, Defendant may initiate dispute resolution under

Section XVI of this Order. The Defendant shall not significantly reduce or terminate the Wagner Road extraction during the 56-day review period or while Defendant is disputing EGLE's conclusion.

10. Options Array for Transmission Line Failure/Inadequate Capacity. The Defendant has provided EGLE with documentation regarding the life expectancy of the deep transmission line and an Options Array (attached as Attachment H). The Options Array describes the various options that may be available if the deep transmission line fails or the 200 gpm capacity of the existing deep transmission line that transports groundwater from the Eastern Area System to the treatment system located on the Gelman Property proves to be insufficient to meet the Prohibition Zone Containment Objective.

11. Surface Water Sampling. Defendant shall sample annually: Allen Creek, the Allen Creek Drain, and each of its tributaries including the Main, North, South, and Murray Washington branches, as well as the outflow into the Huron River below Argo Dam; First Sister Lake; Second Sister Lake; Third Sister Lake; West Park Pond; Arbor Landing Pond; Smith Ponds; Little Lake; and Honey Creek and its tributaries. This sampling must be conducted under low flow conditions during the months of August, September, or October, following protocols developed by EGLE as implemented in 2019 and 2020 sampling.

B. Western Area

1. Western Area Non-Expansion Cleanup Objective. The Defendant shall prevent the horizontal extent of the Groundwater Contamination in the Western Area, regardless of the depth (as established under Section V.B.3.b and c), from expanding. Compliance with this objective shall be determined as set forth in Section V.B.4, below. Continued migration of Groundwater Contamination into the Prohibition Zone, as may be modified, shall not be

considered expansion and is allowed. A change in the horizontal extent of Groundwater Contamination resulting solely from the Court's application of a new cleanup criterion shall not constitute expansion. Nothing in this Section prohibits EGLE from seeking additional response activities pursuant to Section XVIII.E of this Order. Compliance with the Non-Expansion Cleanup Objective shall be established and verified by the network of monitoring wells in the Western Area to be selected and/or installed by the Defendant as provided in Sections V.B.3.b and c, below ("Western Area Compliance Well Network") and the Compliance Process set forth in Section V.B.4 ("Western Area Compliance Process"). Except as provided in Section VI.C.1, there is no independent mass removal requirement or a requirement that Defendant operate any particular Western Area extraction well(s) at any particular rate beyond what is necessary to prevent the prohibited expansion, provided that Defendant's ability to terminate all groundwater extraction in the Western Area is subject to Section V.C.1.c and the establishment of property use restrictions as required by Section V.B.3.a. If prohibited expansion occurs, as determined by the Western Area Compliance Well Network and the Western Area Compliance Process, Defendant shall undertake additional response activities to return the Groundwater Contamination to the boundary established by the Western Area Compliance Well Network (such response activities may include groundwater extraction at particular locations).

As part of the Third Amendment to Consent Judgment, EGLE agreed to modify the remedial objective for the Western Area as provided herein to a no expansion performance objective in reliance on Defendant's agreement to comply with a no expansion performance objective for the Western Area. To ensure compliance with this objective, Defendant acknowledges that in addition to taking further response action to return the horizontal extent of Groundwater Contamination to the boundary established by the Compliance Well Network,

Defendant shall be subject to stipulated penalties for violation of the objective as provided in Section XVII. Nothing in this Section shall limit Defendant's ability to contest the assessment of such stipulated penalties as provided in this Order.

2. Western Area Groundwater-Surface Water Interface Objective.

a. Defendant shall prevent 1,4-dioxane from venting into surface waters in the Western Area at concentrations above the Generic GSI Cleanup Criterion, except in compliance with Part 201, including MCL 324.20120e ("Groundwater-Surface Water Interface Objective" for the Western Area).

b. GSI Investigation Work Plan. Within 90 days of entry of this Order, Defendant shall submit to EGLE for its review and approval a work plan for investigation of the groundwater-surface water interface in the Western Area and a schedule for implementing the work plan. Defendant's work plan shall include:

i. An evaluation of the Western Area and identification of any areas where the GSI pathway is relevant, i.e., any areas where 1,4-dioxane in groundwater is reasonably expected to vent to surface water in concentrations that exceed the Generic GSI Criterion based on evaluation of the factors listed in MCL 324.20120e(3); and

ii. A description of the Response Activities Defendant will take to determine whether 1,4-dioxane in groundwater is venting to surface water in any such areas in concentrations that exceed the Generic GSI Criterion.

c. GSI Response Activity Work Plan. With respect to any areas where the above-described GSI investigation demonstrates that 1,4-dioxane in groundwater is venting to surface water in any such areas in concentrations that exceed the Generic GSI Criterion, Defendant shall submit for EGLE review and approval a work plan and a schedule for

implementing the work plan that describes the Response Activities, including any evaluations under MCL 324.20120e, Defendant will undertake to ensure compliance with Groundwater-Surface Water Interface Objective within a reasonable timeframe.

d. Compliance with Groundwater-Surface Water Interface Objective.

Defendant shall undertake such Response Activities and/or evaluations as necessary to achieve compliance with the Groundwater-Surface Water Interface Objective. It shall not be a violation of this Order nor shall Defendant be subject to stipulated penalties unless and until Defendant fails to achieve compliance with the Groundwater-Surface Water Interface Objective within a reasonable timeframe established by EGLE and then only from that point forward. EGLE's determination of a reasonable timeframe for compliance with the Groundwater-Surface Water Interface Objective is subject to dispute resolution under Section XVI.

3. Western Area Response Activities. Defendant shall implement the following response activities:

a. Groundwater Extraction. The Western Area Response Activities shall include the operation of groundwater extraction wells as necessary to meet the objectives described in Section V.B.1 and 2, including operation of the Marshy Area groundwater extraction system described in Defendant's May 5, 2000 Final Design and Effectiveness Monitoring Plan, as subsequently modified and approved by EGLE. Defendant shall also install and operate additional groundwater extraction wells at the Gelman Property as described in Section VI, below, in order to reduce the mass of 1,4-dioxane in the groundwater. Purged groundwater from the Western Area shall be treated with ozone/hydrogen peroxide or ultraviolet light and oxidizing agent(s), or such other method approved by EGLE to reduce 1,4-dioxane concentrations to the level required by NPDES Permit No. MI-0048453, as amended or reissued.



Discharge to the Honey Creek tributary shall be in accordance with NPDES Permit No. MI-0048453, as amended or reissued. The Defendant shall have property use restrictions that are sufficient to prevent unacceptable exposures in place for any properties affected by Soil Contamination or Groundwater Contamination before completely terminating extraction in the Western Area.

b. Western Area Delineation Investigation. Defendant shall install the following additional groundwater monitoring wells pursuant to a schedule approved by EGLE and subject to the accessibility of the locations and obtaining access and any required approvals under Section VII.D at the approximate locations described below and on the map attached as Attachment G to address gaps in the current definition of the Groundwater Contamination and to further define the horizontal extent of Groundwater Contamination in the Western Area:

- i. Commercial area north of Jackson Road (across from April Drive) and south of US-Highway I-94, near MW-40s&d. (Deep well only) (Location “I” on Attachment G);
- ii. Commercial area north of Jackson Road (across from Nancy Drive) and south of US-Highway I-94, east of MW-40s&d and west of the MW-133 cluster (Location “J” on Attachment G);
- iii. Residential area west of West Delhi, north of Jackson Road and south of US-Highway I-94 (Location “K” on Attachment G);

- iv. Residential area southwest of the MW-141 cluster in the vicinity of Kilkenny and Birkdale (Location “L” on Attachment G);
- v. Residential area along Myrtle between Jackson Road and Park Road (Shallow Well only) (Location “M” on Attachment G);  
and
- vi. Residential and vacant area within approximately 250 feet of Honey Creek southwest of Dexter Road (Location “N” on Attachment G).
- vii. Location of former MW-63 well cluster (shown on Attachment G).

This investigation may be amended by agreement of EGLE and the Defendant to reflect data obtained during the investigation. Defendant shall promptly provide the data/results from the investigation to EGLE so that EGLE receives them prior to Defendant’s submission of the Compliance Monitoring Plan described in Subsection V.B.3.c, below. Based on the data obtained from the wells described above, Defendant may propose to install additional monitoring wells to potentially serve as Compliance Wells rather than one or more of the wells identified above. EGLE reserves the right to request the installation of additional borings/monitoring wells, if the totality of the data indicate that the horizontal extent of Groundwater Contamination has not been completely defined.

c. Compliance Well Network and Compliance Monitoring Plan.

Within 30 days of completing the investigation described in Subsection V.B.3.b, above,

Defendant shall amend its Western Area Monitoring Plan dated April 18, 2011, including Defendant's analysis of the data obtained during the investigation for review and approval by EGLE, to identify the network of compliance wells that will be used to confirm compliance with the Western Area Non-Expansion Cleanup Objective (hereinafter referred to as the "Compliance Monitoring Plan"). The Compliance Monitoring Plan shall include the collection of data from a compliance well network sufficient to verify the effectiveness of the Western Area System in meeting the Western Area Non-Expansion Cleanup Objective. The locations and/or number of the Compliance Wells for the Compliance Monitoring Plan will be determined based on the data obtained from the investigation Defendant shall conduct pursuant to Section V.B.3.b, and shall be made up of existing monitoring wells. EGLE shall approve the Compliance Monitoring Plan, submit to Defendant changes in the Compliance Monitoring Plan that would result in approval, or deny the Compliance Monitoring Plan within 35 days of receiving the Compliance Monitoring Plan. Defendant shall either implement the EGLE-approved Compliance Monitoring Plan, including any changes required by EGLE, or initiate dispute resolution pursuant to Section XVI of this Order. Defendant shall implement the EGLE- (or Court)-approved Compliance Monitoring Plan to verify the effectiveness of the Western Area System in meeting the Western Area Non-Expansion Cleanup Objective. Defendant shall continue to implement the current EGLE-approved monitoring plan(s) until EGLE approves the Compliance Monitoring Plan required by this Section. The monitoring program shall be continued until terminated pursuant to Section V.D.

d. Municipal Water Connection Contingency Plan ("MWCCP").

Defendant shall develop a MWCCP addressing the potential provision of township water to

properties using private drinking water wells on Elizabeth Road. The MWCCP will be developed according to a schedule to be approved by EGLE.

4. Compliance Determination for Non-Expansion Objective. The Compliance Monitoring Plan shall include the following steps for verifying sampling results and confirming compliance or noncompliance with the Western Area Non-Expansion Cleanup Objective.

a. Monitoring Frequency/Analytical Method. Defendant will sample groundwater from the Compliance Wells on a quarterly basis unless an alternative schedule is agreed upon with EGLE. Groundwater samples will be submitted to a laboratory owned, operated or contracted by Defendant for 1,4-dioxane analysis.

b. Verification Process. Defendant shall conduct the Verification Process as defined in Section III.X for each Compliance Well to verify any exceedance of 3.5 ppb. A verified detection above 3.5 ppb will be considered a “Verified Compliance Well Exceedance.” If a second sample does not exceed 3.5 ppb, monitoring of the well will increase to monthly until the pattern of exceedances is broken by two successive sampling events below 3.5 ppb. At that point, a quarterly monitoring frequency will resume.

c. Response Activities. In the event of a Verified Compliance Well Exceedance, Defendant shall take the following Response Activities:

i. Sample selected nearby private drinking water wells. Defendant shall sample select private drinking water wells unless otherwise the Parties otherwise agree. Prior to sampling the selected wells, Defendant shall submit a list of the wells to be sampled and other sampling details to EGLE for approval. In selecting wells to be sampled, Defendant shall consider data collected from monitoring and private drinking water wells within

1,000 feet of the Compliance Well(s) that exceeded 3.5 ppb, groundwater flow, hydrogeology and well depth. EGLE shall respond within seven days after receipt of Defendant's list of select private drinking water wells and shall either approve the list or propose alternate or additional wells to be sampled.

ii. If a Verified Compliance Well Exceedance occurs in the same Compliance Well in any two successive monthly sampling events, Defendant shall take the following Response Activities:

(A) Continue to sample the previously selected private drinking water well(s) on a monthly basis unless otherwise agreed upon with EGLE.

(B) Conduct focused hydrogeological investigation to determine whether the Verified Compliance Well Exceedance is a temporary fluctuation or evidence of plume expansion. The investigation shall include the measurement of groundwater levels in relevant monitoring wells in the vicinity of the Compliance Well with the Verified Compliance Well Exceedance. Defendant shall report its findings to EGLE within 30 days of completing the hydrogeological investigation.

(C) Conduct Statistical Analysis. During the eight month period after the second consecutive Verified Compliance Well Exceedance, Defendant shall complete a statistical analysis of the data using a Mann-Kendall Trend Test or other statistical technique approved by EGLE.

(D) Interim Measures Feasibility Study. During the eight month period after the second consecutive Verified Compliance Well Exceedance, Defendant shall evaluate affirmative measures to control expansion of the Groundwater Contamination as necessary to reduce the concentration of 1,4-dioxane in the relevant

Compliance Well to below 3.5 ppb, including adjustments in groundwater extraction rates, the installation of additional groundwater extraction wells or other remedial technologies.

Defendant shall submit to EGLE a feasibility study within 240 days of the Verified Compliance Well Exceedance. The feasibility study shall include an evaluation of the feasibility and effectiveness of all applicable measures to control expansion of the Groundwater Contamination as necessary to reduce the concentration of 1,4-dioxane in the relevant Compliance Well to below 7.2 ppb in light of the geology and current understanding of the fate and transport of the Groundwater Contamination.

iii. If, after conducting the focused hydrogeological investigation and statistical analysis, the totality of the data evidences a reasonable likelihood that the Western Area Non-Expansion Cleanup Objective is not being met, Defendant shall evaluate and, subject to EGLE approval, implement one or more of the potential response activities identified in the feasibility study, or other response activities, as necessary to achieve compliance with the Western Area Non-Expansion Cleanup Objective. Nothing in this Section shall prevent Defendant from implementing response activities as necessary to achieve the Western Area Non-Expansion Cleanup Objective at an earlier time.

d. Stipulated Penalties/Exacerbation. Defendant shall not be subject to stipulated penalties until concentrations in at least four consecutive monthly samples from a given Compliance Well exceed 7.2 ppb, at which point Defendant shall be subject to stipulated penalties for violation of the Western Area Non-Expansion Cleanup Objective as provided in Section XVII, provided, however, that Defendant shall not be subject to stipulated penalties with respect to prohibited expansion of the horizontal extent of the Groundwater Contamination if Defendant can demonstrate by a preponderance of the evidence that the migration of the

Groundwater Contamination is caused in whole or in part by the actions of an unrelated third party that have contributed to or exacerbated the Groundwater Contamination. In such event, although Defendant is not subject to stipulated penalties, Defendant shall remain responsible for mitigating the migration of the Groundwater Contamination. Nothing in this Order shall preclude Defendant from seeking contribution or cost recovery from other parties responsible for or contributing to exacerbation of the Groundwater Contamination.

e. Private Drinking Water Well Response Activities. If, after conducting the focused hydrogeological investigation and statistical analysis, the totality of the data evidences a reasonable likelihood that 1,4-dioxane will be present at concentrations above 7.2 ppb in a residential drinking water well and/or at concentrations above 350 ppb in an active non-residential drinking water well, Defendant shall evaluate and, if appropriate, implement response activities, including, without limitation, the following:

i. Sampling of at risk drinking water well(s) on a monthly basis;

ii. Implementation of affirmative interim measures to mitigate the expansion of 1,4-dioxane at concentrations above the applicable drinking water standard toward the drinking water well(s) as determined in the feasibility study described in Section V.B.4.c.ii.(D);

iii. Evaluation of land use restrictions and/or institutional controls to eliminate drinking water exposures to 1,4-dioxane in the groundwater at concentrations above the applicable drinking water standard; and

iv. Evaluation of water supply alternatives including, but not limited to, providing bottled water, a township water connection, installation of a new drinking

water well completed in an uncontaminated portion of the subsurface, and point-of-use treatment systems.

v. If at any time 1,4-dioxane is detected in an active private drinking water well above 3.0 ppb, Defendant shall promptly at its expense, offer the occupants of the property the option of receiving bottled water and shall sample the well monthly. These obligations shall terminate if either (i) the 1,4-dioxane concentration in the well drops below 3.0 ppb during two consecutive sampling events or (ii) the property is connected to a permanent alternative water supply. Furthermore, Defendant shall work with EGLE and municipal authorities to evaluate long-term and economically reasonable water supply options.

vi. If 1,4-dioxane is detected at concentrations above 7.2 ppb in an active residential drinking water well and/or at concentrations above 350 ppb in an active non-residential drinking water well, Defendant shall conduct the Verification Process as defined in Section III.X for each such private drinking water well. If the detection above 7.2 ppb is verified, Defendant shall monitor each such private drinking water well on a monthly basis if not already doing so and shall continue monthly monitoring until the well is no longer considered at risk under Section V.B.4.e.i. If 1,4-dioxane is detected at concentrations above 7.2 ppb in four consecutive monthly samples or any seven monthly samples in any 12 month period, Defendant shall provide at its expense a long-term alternative water supply to the property serviced by the affected well. Such long-term alternative water supply may be in the form of a township water connection, installation of a new drinking water well completed in an uncontaminated portion of the subsurface, or a point-of-use treatment system, or other long-term drinking water supply option approved by EGLE. Defendant shall also provide at its expense bottled water to the property owner until the property is serviced by a long-term alternative water supply.



5. Groundwater Contamination Delineation. Additional delineation of the extent of Groundwater Contamination, including within the plume boundary, and/or characterization of source areas shall not be required except as provided in Section V.B.3.c. EGLE reserves the right to petition the Court to require additional work if there are findings that EGLE determines warrant additional Groundwater Contamination delineation.

C. Termination of Groundwater Extraction Systems

1. Defendant may only terminate the Groundwater Extraction Systems listed below as provided below:

a. Termination Criteria for Evergreen Wells/Maple Road Wells/Wagner Road Wells. Except as otherwise provided pursuant to Section V.C.2, Defendant may only reduce (below the stated minimum purge rates) or terminate operation of the Evergreen Wells/Maple Road Wells as provided in Section V.A.3.f.i. and of the Wagner Road Wells as provided in Section V.A.9.

b. Termination Criteria for Parklake Well. Except as otherwise provided pursuant to Section V.C.2, Defendant may reduce or terminate operation of the Parklake Well as provided in Section V.A.3.f.ii.

c. Termination Criteria for Western Area. Defendant may terminate the groundwater extraction described in Section VI.C.1 as provided in that Section. Except as otherwise provided pursuant to Section V.C.2, and subject to Section V.B.1., Defendant shall not terminate all groundwater extraction in the Western Area until all of the following are established:

i. Defendant can establish to EGLE’s satisfaction that groundwater extraction is no longer necessary to prevent the expansion of Groundwater Contamination prohibited under Section V.B.1;

ii. Defendant’s demonstration shall also establish that groundwater extraction is no longer necessary to satisfy the Groundwater-Surface Water Interface Objective under Section V.B.2; and

iii. Defendant has the land use or resource use restrictions described in Section V.B.3.a in place.

Defendant’s request to terminate extraction in the Western Area must be made in writing for review and approval pursuant to Section X of this Order. The request must include all supporting documentation demonstrating compliance with the termination criteria. Defendant may initiate dispute resolution pursuant to Section XVI of this Order if EGLE does not approve the Defendant’s request/demonstration. Defendant may terminate Western Area groundwater extraction upon: (i) receipt of notice of approval from EGLE; or (ii) receipt of notice of a final decision approving termination pursuant to dispute resolution procedures of Section XVI of this Order.

2. Modification of Termination Criteria/Cleanup Criteria. The termination criteria provided in Section V.C.1. and/or the definition of “Groundwater Contamination” or “Soil Contamination” may be modified as follows:

a. After entry of this Order, Defendant may propose to EGLE that the termination criteria be modified based upon either or both of the following:

i. a change in legally applicable or relevant and appropriate regulatory criteria since the entry of this Order; for purposes for this Subsection, “regulatory

criteria” shall mean any promulgated standard criterion or limitation under federal or state environmental law specifically applicable to 1,4-dioxane; or

ii. scientific evidence newly released since the date of the United States Environmental Protection Agency’s IRIS risk assessment for 1,4-dioxane (August 11, 2010), which, in combination with the existing scientific evidence, establishes that different termination criteria/definitions for 1,4-dioxane are appropriate and will assure protection of public health, safety, welfare, the environment, and natural resources.

b. Defendant shall submit any such proposal in writing, together with supporting documentation, to EGLE for review.

c. If the Defendant and EGLE agree to a proposed modification, the agreement shall be made by written Stipulation filed with the Court pursuant to Section XXV of this Order, subject to the ongoing rights of the Intervenors under Section XXI of this Order.

d. If EGLE disapproves the proposed modification, Defendant may invoke the dispute resolution procedures contained in Section XVI of this Order. Alternatively, if EGLE disapproves a proposed modification, Defendant may seek to have the dispute resolved pursuant to Subsection V.C.3.

3. If the Defendant invokes the procedures of this Subsection, Defendant and EGLE shall prepare a list of the items of difference to be submitted to a scientific advisory panel for review and recommendations. The scientific advisory panel shall be comprised of three persons with scientific expertise in the discipline(s) relevant to the items of difference. No member of the panel may be a person who has been employed or retained by either Party, except persons compensated solely for providing peer review of the Hartung Report, in connection with the subject of this litigation.

a. If this procedure is invoked, each Party shall, within 14 days, select one member of the panel. Those two members of the panel shall select the third member. Defendant shall, within 28 days after this procedure is invoked, establish a fund of at least \$10,000.00, from which each member of the panel shall be paid reasonable compensation for their services, including actual and necessary expenses. If EGLE and Defendant do not agree concerning the qualifications, eligibility, or compensation of panel members, they may invoke the dispute resolution procedures contained in Section XVI of this Order.

b. Within a reasonable period of time after selection of all panel members, the panel shall confer and establish a schedule for acceptance of submissions from EGLE and the Defendant completing review and making recommendations on the items of difference.

c. The scientific advisory panel shall make its recommendations concerning resolution of the items of difference to EGLE and the Defendant. If both EGLE and Defendant accept those recommendations, the termination criteria shall be modified in accordance with such recommendations. If EGLE and the Defendant disagree with the recommendations, EGLE's proposed resolution of the dispute shall be final unless Defendant invokes the procedures for judicial dispute resolution as provided in Section XVI of this Order. The recommendation of the scientific advisory panel and any related documents shall be submitted to the Court as part of the record to be considered by the Court in resolving the dispute.

D. Post-Termination Monitoring

1. Eastern Area

a. Prohibition Zone Containment Objective. Except as otherwise provided pursuant to Section V.C.2, Defendant shall continue to monitor the Groundwater Contamination as it migrates within the Prohibition Zone until all approved monitoring wells are below 7.2 ppb or such other applicable criterion for 1,4-dioxane for six consecutive months, or Defendant can establish to EGLE's satisfaction that continued monitoring is not necessary to satisfy the Prohibition Zone Containment Objective. Defendant's request to terminate monitoring must be made in writing for review and approval pursuant to Section X of this Order. Defendant may initiate dispute resolution pursuant to Section XVI of this Order if EGLE does not approve its termination request.

b. Groundwater-Surface Water Interface Objective. Except as provided in Section V.D.1.a, for Prohibition Zone monitoring wells, post-termination monitoring is required for Eastern Area wells for a minimum of ten years after purging is terminated under Section V.C.1.a with cessation subject to EGLE approval. Defendant's request to terminate monitoring must be made in writing for review and approval pursuant to Section X of this Order. Defendant may initiate dispute resolution pursuant to Section XVI of this Order if EGLE does not approve its termination request.

2. Western Area. Post-termination monitoring will be required for a minimum of ten years after termination of extraction with cessation subject to EGLE approval. Except as otherwise provided pursuant to Section V.C.2, Defendant shall continue to monitor the groundwater in accordance with approved monitoring plan(s), to verify that it remains in compliance with the Non-Expansion Cleanup Objective set forth in Section V.B.1 and the Groundwater-Surface Water Interface Objective set forth in Section V.B.2. If any exceedance is

detected, Defendant shall immediately notify EGLE and take whatever steps are necessary to comply with the requirements of Section V.B.1, or V.B.2, as applicable.

E. Quality Assurance Project Plan (QAPP). Defendant previously voluntarily submitted to EGLE for review and approval a QAPP, which is intended to describe the quality control, quality assurance, sampling protocol, and chain of custody procedures that will be used in carrying out the tasks required by this Order. EGLE shall review, and Defendant shall revise accordingly, the QAPP to ensure that it is in general accordance with the United States Environmental Protection Agency's ("U.S. EPA" or "EPA") "Guidance for Quality Assurance Project Plans," EPA QA/G-5, December 2002; and American National Standard ANSI/ASQC E4-2004, "Quality Systems For Environmental Data And Technology Programs – Requirements With Guidance For Use."

## **VI. GELMAN PROPERTY RESPONSE ACTIVITIES**

A. Gelman Property Objectives. The objectives for the Gelman Property shall be to prevent the migration of 1,4-dioxane from contaminated soils on the Gelman Property into any aquifer at concentrations or locations that cause non-compliance with the Western Area objectives set forth in Sections V.B.1 and V.B.2.

B. Response Activities.

1. Remedial Systems. Defendant shall design and implement remedial systems at the Gelman Property as necessary to achieve the Gelman Property Objectives.

2. Monitoring. Defendant shall implement an EGLE-approved Compliance Monitoring Plan to verify that the Gelman Property Soil Contamination does not cause or contribute to non-compliance with the Western Area objectives set forth in Sections V.B.1 and V.B.2, and to verify the effectiveness of any implemented remedial system.

3. Within 180 days of entry of this Order, Gelman shall submit to EGLE for its review and approval a plan to verify the effectiveness of the phytoremediation installations.

At a minimum, the plan shall include:

(i) procedures to determine or reliably estimate rates of biodegradation and transpiration for 1,4-dioxane in both the Former Pond and Marshy Areas;

(ii) measurement of 1,4-dioxane concentrations in groundwater beneath the Former Pond and Marshy Areas;

(iii) groundwater logging throughout the tree plots to verify expected dewatering;

(iv) verification of the extent to which trees planted in caissons have root systems that penetrate lower aquifers containing high concentrations of 1,4-dioxane;

(v) a modeled estimate of the impact of the tree plots on the availability and migration of 1,4-dioxane from the phytoremediation areas;

(vi) an evaluation of the 1,4-dioxane content of the trees for categorization purposes once disposal becomes necessary,

(vii) monitoring points along the Honey Creek Tributary to determine compliance with the GSI criterion, and

(viii) any additional monitoring criteria Gelman and EGLE deem appropriate.

C. Additional Source Control. Defendant shall implement the following Response Activities to reduce the mass of and/or exposure to 1,4-dioxane present in the soils and/or shallow groundwater on the Gelman Property subject to receipt of any required approvals pursuant to Section VII.D:

1. Additional Groundwater Extraction. Defendant shall install and operate six extraction wells (one of which was previously installed) at the general locations depicted in

the attached Attachment I to enhance control and mass removal of 1,4-dioxane from this area of shallow groundwater contamination. Defendant shall operate these extraction wells at a combined purge rate of approximately 150 gpm, subject to aquifer yield. Defendant shall have the discretion to adjust the individual well purge rates in order to optimize mass removal. Subject to Defendant's ability to adjust individual well purge rates, Defendant shall continue to extract a combined purge rate of approximately 150 gpm, subject to aquifer yield, from this system until the effluent 1,4-dioxane concentrations from each of these extraction wells indicate continued extraction will no longer contribute to the beneficial reduction in 1,4-dioxane mass and, once this has occurred for all six of the wells, Defendant shall cycle those wells off and on for several periods of time approved by EGLE to demonstrate that significant concentration rebound is not occurring. Before otherwise significantly reducing or terminating extraction from this system, Defendant shall consult with EGLE and provide a written analysis, together with the data that supports its conclusion that continued extraction will no longer contribute to the beneficial reduction in 1,4-dioxane mass, as stated above. EGLE will review the analysis and data and provide a written response to Defendants within 56 days after receiving Defendant's written analysis and data. If Defendant disagrees with EGLE's conclusion, Defendant may initiate dispute resolution under Section XVI of this Order. The Defendant shall not significantly reduce or terminate the extraction from this system during the 56-day review period or while Defendant is disputing EGLE's conclusion.

Based on the performance achieved from the above initial six extraction wells, the Parties shall evaluate whether installation and operation of additional extraction wells would accelerate mass removal to a degree that meaningfully benefits the Remediation. If EGLE determines that additional mass removal of 1,4-dioxane from additional wells would be beneficial, Defendant



shall, subject to its right to invoke Dispute Resolution under Section XVI, install and operate these additional wells pursuant to a work plan approved by EGLE.

Groundwater extracted from the extraction wells described in this subparagraph will be conveyed to the Wagner Road Treatment Facility for treatment and disposal pursuant to Defendant's NPDES Permit No. MI-0048453, as amended or re-issued.

2. Phytoremediation—Former Pond 1 and 2 Area. Defendant shall apply phytoremediation techniques in the treatment area depicted on Attachment I to reduce the potential mass flux of 1,4-dioxane from vadose zone soils in this area to the groundwater aquifers. Defendant shall plant and maintain trees in the treatment area in order to: (i) remove 1,4-dioxane mass by via biodegradation and transpiration; and (ii) extract and reduce the volume of shallow perched groundwater in this area. Defendant shall install and maintain the trees in a healthy state and replace trees as necessary to assure continued success of the phytoremediation system. Defendant shall continue to operate the phytoremediation system as set forth above until it determines that the further reduction of the mass flux of 1,4-dioxane from the vadose zone soils to the groundwater aquifers is not necessary to achieve compliance with the Gelman Property Objectives. Before significantly reducing or terminating phytoremediation in the Former Pond 1 and 2 area, Defendant shall consult with EGLE and provide a written analysis, together with the data that supports its conclusions. EGLE will review the analysis and data and provide a written response to Defendants within 56 days after receiving Defendant's written analysis and data. If Defendant disagrees with EGLE's conclusion, Defendant may initiate dispute resolution under Section XVI of this Order. The Defendant shall not significantly reduce

or terminate the phytoremediation during the 56-day review period or while Defendant is disputing EGLE's conclusion.

3. Phytoremediation—Marshy Area. Defendant will undertake actions to reduce the percolation/infiltration of 1,4-dioxane from Marshy Area to the underlying groundwater through the application of phytoremediation techniques in the area depicted in Attachment I. The initial phase of these Response Activities may include further investigation of the Marshy Area as needed to complete the phytoremediation design regarding methods of enabling roots from trees grown in the Marshy Area to extend into deeper soils containing elevated concentrations of 1,4-dioxane. Defendant shall install and maintain the trees in a healthy state as necessary to assure continued success of the phytoremediation system. Defendant shall continue to operate the phytoremediation system as set forth above until it determines that the further reduction of the percolation/infiltration of 1,4-dioxane from the Marshy Area to the underlying groundwater is not necessary to achieve compliance with the Gelman Property Objectives. Before significantly reducing or terminating phytoremediation in the Marshy Area, Defendant shall consult with EGLE and provide a written analysis, together with the data that supports its conclusions. EGLE will review the analysis and data and provide a written response to Defendants within 56 days after receiving Defendant's written analysis and data. If Defendant disagrees with EGLE's decision to reduce or terminate the phytoremediation in the Marshy Area, Defendant may initiate dispute resolution under Section XVI of this Order. The Defendant shall not significantly reduce or terminate the phytoremediation in the Marshy Area during the 56-day review period or while Defendant is disputing EGLE's conclusion.

4. Former Burn Pit Area. Defendant shall undertake the following Response Activities with respect to the former Burn Pit area depicted on Attachments I and J:

a. Install, operate, and maintain a Heated Soil Vapor Extraction System (“HSVE System”). The HSVE System shall be designed to reduce the mass of 1,4-dioxane present in the soils in the portion of the former Burn Pit area identified as “Heated Soil Vapor Extraction” on Attachment J. Defendant shall operate the HSVE system until 1,4-dioxane concentrations in the HSVE System’s effluent/exhaust has been reduced to levels that indicate that continued operation of the HVSE system will no longer contribute to meaningful reduction of 1,4-dioxane mass in the Former Burn Pit Area Soils or the Soil Contamination in the treatment area is eliminated, whichever occurs first. Defendant shall cycle the HSVE System off and on for several periods of time approved by EGLE to demonstrate that significant concentration rebound is not occurring. Before significantly reducing or terminating operation of the HSVE system, Defendant shall consult with EGLE and provide a written analysis, together with the data that supports its conclusion, that one or both of the above conditions has been satisfied. EGLE will review the analysis and data and provide a written response to Defendant within 56 days after receiving Defendant’s written analysis and data. If Defendant disagrees with EGLE’s conclusion, Defendant may initiate dispute resolution under Section XVI of this Order. The Defendant shall not significantly reduce or terminate operation of the HSVE system during the 56-day review period or while Defendant is disputing EGLE’s conclusion.

As part of the installation of the HSVE System, Defendant shall install an impervious barrier over the HSVE Treatment Area to limit infiltration of surface air and inhibit water from percolating through the soils in the former Burn Pit Area. Defendant shall maintain the impervious barrier in place until Soil Contamination is no longer present in the underlying soils.

b. Cap the portion of the former Burn Pit area identified as “Capped Area” on Attachment J with an impervious barrier to inhibit water from percolating through the

soils in the former Burn Pit area. Defendant shall maintain the impervious barrier in place until Soil Contamination is no longer present in the underlying soils.

5. After completing installation of the Response Activity systems listed in Sections VI.C.2, VI.C.3 and VI.C.4, the Defendant shall submit a separate installation report (i.e., as-built report) for each of the systems. The reports shall describe the systems as installed including, but not limited to, components of a system, location of components within the specific areas, depths of components of a system, and operational specifications of components of a system.

6. Required Approvals. Notwithstanding the above, Defendant's obligation to implement any of the additional source control Response Activities described in Section VI.C is conditioned upon receipt of any required approvals pursuant to Section VII.D.

## **VII. COMPLIANCE WITH OTHER LAWS AND PERMITS**

A. Defendant shall undertake all activities pursuant to this Order in accordance with the requirements of all applicable laws, regulations, and permits.

B. Defendant shall apply for all permits necessary for implementation of this Order including, without limitation, surface water discharge permit(s) and air discharge permit(s).

C. Defendant shall include in all contracts entered into by the Defendant for Remedial Action required under this Order (and shall require that any contractor include in all subcontracts), a provision stating that such contractors and subcontractors, including their agents and employees, shall perform all activities required by such contracts or subcontracts in compliance with and all applicable laws, regulations, and permits. Defendant shall provide a copy of relevant approved work plans to any such contractor or subcontractor.

D. The Plaintiffs agree to provide reasonable cooperation and assistance to the Defendant in obtaining necessary approvals and permits for Remedial Action. Plaintiffs shall not unreasonably withhold or delay any required approvals or permits for Defendant's performance of Remedial Action. Plaintiffs expressly acknowledge that one or more of the following permits and approvals may be a necessary prerequisite for one or more of the Response Activities set forth in this Order:

1. Renewal of NPDES Permit No. MI-0048453 with respect to the discharge of treated groundwater to the unnamed tributary of Honey Creek.

2. An NPDES Permit that authorizes the discharge of groundwater to First Sister Lake in connection with operation of the Parklake Well following treatment with ozone/hydrogen peroxide technology that has effluent limitations, discharge limits (other than volume), and other conditions no more restrictive than those included in Defendant's 2014 NPDES Permit.

3. Negotiation and execution of an access agreement between Defendant and the City of Ann Arbor providing reasonable and necessary access to the City-owned parcel at Parklake Avenue and Jackson Road with respect to installation and operation of an extraction well, operation and maintenance of a groundwater treatment unit, and disposal of treated groundwater.

4. An Air Permit for discharges of contaminants to the atmosphere for vapor extraction systems, including the HSVE system described in Subsection VI.C.4, under terms reasonably acceptable to Defendant and as necessary if such systems are part of the remedial design.

5. Wetlands Permit(s) from EGLE and/or Scio Township if necessary for the response activities described in Section VI.C.3 with terms reasonably acceptable to Defendant.

6. An Industrial User's Permit to be issued by the City of Ann Arbor for use of the sewer to dispose of treated or untreated purged groundwater from the Evergreen and/or Maple Road Wells. Plaintiffs have no objection to receipt by the Ann Arbor Wastewater Treatment Plant of the purged groundwater extracted pursuant to the terms and conditions of this Order, and acknowledge that receipt of the purged groundwater would not necessitate any change in current and proposed residual management programs of the Ann Arbor Wastewater Treatment Plant.

7. Permit(s) or permit exemptions to be issued by EGLE to authorize the reinjection of purged and treated groundwater in the Eastern Area and Western Area.

8. Surface water discharge permit(s) for discharge into surface waters in the area of Little Lake, if necessary.

9. Approval of the City of Ann Arbor and the Washtenaw County Drain Commissioner to use storm drains or sewers for the remedial programs.

10. Washtenaw County permits as necessary for the installation of extraction wells, monitoring wells, and borings.

### **VIII. SAMPLING AND ANALYSIS**

Defendant shall make available to EGLE the results of all sampling, tests, and/or other data generated in the performance or monitoring of any requirement under this Order. Sampling data generated consistent with this Order shall be admissible in evidence in any proceeding related to enforcement of this Order without waiver by any Party of any objection as to weight or relevance. EGLE and/or their authorized representatives, at their discretion, may take split or

duplicate samples and observe the sampling event. EGLE shall make available to Defendant the results of all sampling, tests, and/or other data generated in the performance or monitoring of any requirement under this Order. Defendant will provide EGLE with reasonable notice of changes in the schedule of data collection activities included in the progress reports submitted pursuant to Section XII.

### **IX. ACCESS**

A. From the effective date of this Order, EGLE, its authorized employees, agents, representatives, contractors, and consultants, upon presentation of proper identification, shall have the right at all reasonable times to enter the Site and any property to which access is required for the implementation of this Order, to the extent access to the property is owned, controlled by, or available to the Defendant, for the purpose of conducting any activity authorized by this Order, including, but not limited to:

1. Monitoring of the Remedial Action or any other activities taking place pursuant to this Order on the property;
2. Verification of any data or information submitted to EGLE;
3. Conduct of investigations related to 1,4-dioxane concentrations at the Site;
4. Collection of samples;
5. Assessment of the need for, or planning and implementing of, Response Activities at the Site; and
6. Inspection and copying of non-privileged documents including records, operating logs, contracts, or other documents required to assess Defendant's compliance with this Order.

All Parties with access to the Site or other property pursuant to this Section shall comply with all applicable health and safety laws and regulations.

B. To the extent that the Site or any other area where Remedial Action is to be performed by the Defendant under this Order is owned or controlled by persons other than the Defendant, Defendant shall use its best efforts to secure from such persons access for Defendant, EGLE, and their authorized employees, agents, representatives, contractors, and consultants. Defendant shall provide EGLE with a copy of each access agreement secured pursuant to this Section. For purposes of this Section, “best efforts” includes, but is not limited to, seeking judicial assistance to secure such access pursuant to MCL 324.20135a.

#### **X. APPROVALS OF SUBMISSIONS**

Upon receipt of any plan, report, or other item that is required to be submitted for approval pursuant to this Order, as soon as practicable, but in no event later than 56 days after receipt of such submission, EGLE will: (1) approve the submission or (2) submit to Defendant changes in the submission that would result in approval of the submission. EGLE will (1) approve a feasibility study or plan that proposes a risk based cleanup or a remedy that requires public comment, or (2) submit to Defendant changes in such submittal that would result in approval in the time provided under Part 201. If EGLE does not respond within 56 days, Defendant may submit the matter to dispute resolution pursuant to Section XVI. Upon receipt of a notice of approval or changes from EGLE, Defendant shall proceed to take any action required by the plan, report, or other item, as approved or as may be modified to address the deficiencies identified by EGLE. If Defendant does not accept the changes proposed by EGLE, Defendant may submit the matter to dispute resolution pursuant to Section XVI.

#### **XI. PROJECT COORDINATORS**



A. Plaintiffs designate Daniel Hamel as EGLE's Project Coordinator. Defendant designates Lawrence Gelb as Defendant's Project Coordinator. Defendant's Project Coordinator shall have primary responsibility for implementation of the Remedial Action at the Site. EGLE's Project Coordinator will be the primary designated representative for Plaintiffs with respect to implementation of the Remedial Action at the Site. All communication between Defendant and EGLE, including all documents, reports, approvals, other submissions, and correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be directed through the Project Coordinators. If any Party changes its designated Project Coordinator, that Party shall provide the name, address, email address and telephone number of the successor in writing to the other Party seven days prior to the date on which the change is to be effective. This Section does not relieve Defendant from other reporting obligations under the law.

B. EGLE may designate other authorized representatives, employees, contractors, and consultants to observe and monitor the progress of any activity undertaken pursuant to this Order. EGLE's Project Coordinator shall provide Defendant's Project Coordinator with the names, addresses, telephone numbers, positions, and responsibilities of any person designated pursuant to this Section.

## **XII. PROGRESS REPORTS AND UPDATED PLUME MAPS**

A. Defendant shall provide to EGLE written quarterly progress reports that shall: (1) describe the actions which have been taken toward achieving compliance with this Order during the previous three months; (2) describe data collection and activities scheduled for the next three months; and (3) include all results of sampling and tests and other data received by Defendant, its consultants, engineers, or agents during the previous three months relating to Remedial

Action performed pursuant to this Order. Defendant shall submit the first quarterly report to EGLE within 120 days after entry of this Order, and by the 30th day of the month following each quarterly period thereafter, as feasible, until termination of this Order as provided in Section XXVI.

B. Gelman shall utilize all available existing monitoring well data to determine by appropriate hydro-geologic techniques the extent of various concentrations of 1,4-dioxane in groundwater in concentration intervals that are approved by EGLE, which shall include down to concentrations of 1 ppb, 7.2 ppb and 280 ppb and Gelman shall graphically depict plume maps showing those extents of 1,4-dioxane on maps that shall be publicly disclosed. Gelman shall re-determine the extent of the 1,4-dioxane at various concentrations in groundwater semi-annually and shall prepare and publicly disclose updated plume maps with the same concentration intervals as above.

### **XIII. RESTRICTIONS ON ALIENATION**

A. Defendant shall not sell, lease, or alienate the Gelman Property until: (1) it places an EGLE-approved land use or resource use restrictions on the affected portion(s) of the Gelman Property; and (2) any purchaser, lessee, or grantee provides to EGLE its written agreement providing that the purchaser, lessee, or grantee will not interfere with any term or condition of this Order. Notwithstanding any purchase, lease, or grant, Defendant shall remain obligated to comply with all terms and conditions of this Order.

B. Any deed, title, or other instrument of conveyance regarding the Gelman Property shall contain a notice that Defendant's Property is the subject of this Order, setting forth the caption of the case, the case number, and the court having jurisdiction herein.

#### **XIV. FORCE MAJEURE**

Any delay attributable to a Force Majeure shall not be deemed a violation of Defendant's obligations under this Order.

A. "Force Majeure" is defined as an occurrence or nonoccurrence arising from causes beyond the control of Defendant or of any entity controlled by the Defendant performing Remedial Action, such as Defendant's employees, contractors, and subcontractors. Such occurrence or nonoccurrence includes, but is not limited to: (1) an Act of God; (2) untimely review of permit applications or submissions; (3) acts or omissions of third parties for which Defendant is not responsible; (4) insolvency of any vendor, contractor, or subcontractor retained by Defendant as part of implementation of this Order; and (5) delay in obtaining necessary access agreements under Section IX that could not have been avoided or overcome by due diligence. "Force Majeure" does not include unanticipated or increased costs, changed financial circumstances, or nonattainment of the treatment and termination standards set forth in Sections V and VI.

B. When circumstances occur that Defendant believes constitute Force Majeure, Defendant shall notify EGLE by telephone of the circumstances within 48 hours after Defendant first believes those circumstances to apply. Within 14 working days after Defendant first believes those circumstances to apply, Defendant shall supply to EGLE, in writing, an explanation of the cause(s) of any actual or expected delay, the anticipated duration of the delay, the measures taken and the measures to be taken by Defendant to avoid, minimize, or overcome the delay, and the timetable for implementation of such measures. Failure of Defendant to comply with the written notice provisions of this Section shall constitute a waiver of Defendant's right to assert a claim of Force Majeure with respect to the circumstances in question.

C. A determination by EGLE that an event does not constitute Force Majeure, that a delay was not caused by Force Majeure, or that the period of delay was not necessary to compensate for Force Majeure may be subject to dispute resolution under Section XVI of this Order.

D. EGLE shall respond, in writing, to any request by Defendant for a Force Majeure extension within 30 days of receipt of the Defendant's request. If EGLE does not respond within that time period, Defendant's request shall be deemed granted. If EGLE agrees that a delay is or was caused by Force Majeure, Defendant's delays shall be excused, stipulated penalties shall not accrue, and EGLE shall provide Defendant such additional time as may be necessary to compensate for the Force Majeure event.

E. Delay in achievement of any obligation established by this Order shall not automatically justify or excuse delay in achievement of any subsequent obligation unless the subsequent obligation automatically follows from the delayed obligation.

**XV. REVOCATION OR MODIFICATION OF LICENSES OR PERMITS**

Any delay attributable to the revocation or modification of licenses or permits obtained by Defendant to implement remediation actions as set forth in this Order shall not be deemed a violation of Defendant's obligations under this Order, provided that such revocation or modification arises from causes beyond the control of Defendant or of any entity controlled by the Defendant performing Remedial Action, such as Defendant's employees, contractors, and subcontractors.

A. Licenses or permits that may need to be obtained or modified by Defendant to implement the Remedial Actions are those specified in Section VII.D. and licenses, easements,

and other agreements for access to property or rights of way on property necessary for the installation of remedial systems required by this Order.

B. A revocation or modification of a license or permit within the meaning of this Section means withdrawal of permission, denial of permission, a limitation or a change in license or permit conditions that delays the implementation of all or part of a remedial system. Revocation or modification due to Defendant's violation of a license or permit (or any conditions of a license or permit) shall not constitute a revocation or modification covered by this Section.

C. When circumstances occur that Defendant believes constitute revocation or modification of a license or permit, Defendant shall notify EGLE by telephone of the circumstances within 48 hours after Defendant first believes those circumstances to apply. Within 14 working days after Defendant first believes those circumstances to apply, Defendant shall supply to EGLE, in writing, an explanation of the cause(s) of any actual or expected delay, the anticipated duration of the delay, the measures taken and the measures to be taken by Defendant to avoid, minimize, or overcome the delay, and the timetable for implementation of such measures. Failure of Defendant to comply with the written notice provisions of this Section shall constitute a waiver of Defendant's right to assert a claim of revocation or modification of a license or permit with respect to the circumstances in question.

D. A determination by EGLE that an event does not constitute revocation or modification of a license or permit, that a delay was not caused by revocation or modification of a license or permit, or that the period of delay was not necessary to compensate for revocation or modification of a license or permit may be subject to dispute resolution under Section XVI of this Order.

E. EGLE shall respond, in writing, to any request by Defendant for a revocation or modification of a license or permit extension within 30 days of receipt of the Defendant's request. If EGLE does not respond within that time period, Defendant's request shall be deemed granted. If EGLE agrees that a delay is or was caused by revocation or modification of a license or permit, Defendant's delays shall be excused, stipulated penalties shall not accrue, and EGLE shall provide Defendant such additional time as may be necessary to compensate for the revocation or modification of a license or permit.

F. Delay in achievement of any obligation established by this Order shall not automatically justify or excuse delay in achievement of any subsequent obligation unless the subsequent obligation automatically follows from the delayed obligation.

#### **XVI. DISPUTE RESOLUTION**

A. Except as otherwise provided in this Order, the dispute resolution procedures of this Section shall be the exclusive mechanism to resolve disputes arising under this Order and, except as specifically provided to the contrary, shall apply to all provisions of this Order, whether or not particular provisions of this Order in question make reference to the dispute resolution provisions of this Section. Any dispute that arises under this Order initially shall be the subject of informal negotiations among the Parties, including the Intervenors. The period of negotiations shall not exceed ten working days from the date of written notice by EGLE or the Defendant or one or more of the Intervenors that a dispute has arisen. This period may be extended or shortened by agreement of EGLE, the Intervenors and the Defendant.

B. Immediately upon expiration of the informal negotiation period (or sooner if upon agreement of the parties), EGLE shall provide to Defendant and the Intervenors a written statement setting forth EGLE's proposed resolution of the dispute. Such resolution shall be final

unless, within 15 days after receipt of EGLE's proposed resolution (clearly identified as such under this Section), Defendant or an Intervenor files a petition for resolution with the Washtenaw County Circuit Court setting forth the matter in dispute, the efforts made by the Parties and the Intervenors to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of this Order.

C. Within ten days of the filing of the petition, EGLE, Defendant or an Intervenor may file a response to the petition, and unless a dispute arises from the alleged failure of EGLE to timely make a decision, EGLE will submit to the Court all documents containing information related to the matters in dispute, including documents provided to EGLE by Defendant or the Intervenors. In the event of a dispute arising from the alleged failure of EGLE to timely make a decision, within ten days of filing of the petition, each party shall submit to the Court correspondence, reports, affidavits, maps, diagrams, and other documents setting forth facts pertaining to the matters in dispute. Those documents and this Order shall comprise the record upon which the Court shall resolve the dispute. Additional evidence may be taken by the Court on its own motion or at the request of either party or an Intervenor if the Court finds that the record is incomplete or inadequate. Review of the petition shall be conducted by the Court and shall be confined to the record. The review shall be independent of any factual or legal conclusions made by the Court prior to the date of entry of this Order.

D. The Court shall uphold the decision of EGLE on the issue in dispute unless the Court determines that the decision is any of the following:

1. Inconsistent with this Order;
2. Not supported by competent, material, and substantial evidence on the whole record;

- 3. Arbitrary, capricious, or clearly an abuse or unwarranted exercise of discretion; or
- 4. Affected by other substantial and material error of law.

E. The filing of a petition for resolution of a dispute shall not by itself extend or postpone any obligation of Defendant under this Order, provided, however, that payment of stipulated penalties with respect to the disputed matter shall be stayed pending resolution of the dispute. Notwithstanding the stay of payment, stipulated penalties shall accrue as provided in Section XVII. Stipulated penalties that have accrued with respect to the matter in dispute shall not be assessed by the Court and shall be dissolved if Defendant prevails on the matter. The Court may also direct that stipulated penalties shall not be assessed and paid as provided in Section XVII upon a determination that there was a substantial basis for Defendant’s position on the disputed matter.

**XVII. STIPULATED PENALTIES**

A. Except as otherwise provided, if Defendant fails or refuses to comply with any term or condition in Sections IV, V, VI, VII, or VIII, or with any plan, requirement, or schedule established pursuant to those Sections, then Defendant shall pay stipulated penalties in the following amounts for each working day for every failure or refusal to comply or conform:

<u>Period of Delay</u>	<u>Penalty Per Violation Per Day</u>
1st through 15th Day	\$ 1,000
15th through 30th Day	\$ 1,500
Beyond 30 Days	\$ 2,000

B. Except as otherwise provided if Defendant fails or refuses to comply with any other term or condition of this Order, Defendant shall pay to EGLE stipulated penalties of \$500.00 per working day for each and every failure to comply.



C. If Defendant is in violation of this Order, Defendant shall notify EGLE of any violation no later than five working days after first becoming aware of such violation, and shall describe the violation.

D. Stipulated penalties shall begin to accrue upon the next day after performance was due or other failure or refusal to comply occurred. Penalties shall continue to accrue until the final day of correction of the noncompliance. Separate penalties shall accrue for each separate failure or refusal to comply with the terms and conditions of this Order. Penalties may be waived in whole or in part by EGLE or may be dissolved by the Court pursuant to Section XVII.

E. Stipulated penalties shall be paid no later than 14 working days after receipt by Defendant of a written demand from EGLE. Defendant shall make payment by transmitting a check in the amount due, payable to the "State of Michigan," addressed to the Revenue Control Unit; Finance Section, Administration Division; Michigan Department of Environment, Great Lakes, and Energy; P.O. Box 30657; Lansing, MI 48909-8157. The check shall be transmitted via Courier to the Revenue Control Unit; Finance Section, Administration Division; Michigan Department of Environment, Great Lakes, and Energy; Constitution Hall, 5th Floor South Tower; 525 West Allegan Street; Lansing, MI 48933-2125. To ensure proper credit, Defendant shall include the settlement ID - ERD1902 on the payment.

F. Plaintiffs agree that, in the event that an act or omission of Defendant constitutes a violation of this Order subject to stipulated penalties and a violation of other applicable law, Plaintiffs will not impose upon Defendant for that violation both the stipulated penalties provided under this Order and the civil penalties permitted under other applicable laws. EGLE reserves the right to pursue any other remedy or remedies to which they may be entitled under

this Order or any applicable law for any failure or refusal of the Defendant to comply with the requirements of this Order.

**XVIII. RIGHTS RESERVED TO PLAINTIFFS**

A. Notwithstanding any other provision in this Order, the following rights are reserved to EGLE, and Intervenors' rights to intervene remain in effect relative to these rights reserved to EGLE: (1) the right to institute proceedings in this action or in a new action seeking to require Defendant to perform any additional response activity at the Site; and (2) the right to institute proceedings in this action or in a new action seeking to reimburse EGLE for response costs incurred by the State of Michigan relating to the Site. EGLE's reserved rights under Sections XVIII.E.1 and E.2 apply if the following conditions are met:

1. For proceedings prior to EGLE's certification of completion of the Remedial Action concerning the Site,
  - a. (i) conditions at the Site, previously unknown to EGLE, are discovered after entry of this Order, (ii) new information previously unknown to EGLE is received after entry of this Order, or (iii) EGLE adopts one or more new, more restrictive cleanup criteria for 1,4-dioxane pursuant to Part 201 after entry of this Order; and
  - b. these previously unknown conditions, new information, and/or change in criteria indicate that the Remedial Action is not protective of the public health, safety, welfare, and the environment; and
2. For proceedings subsequent to EGLE's certification of completion of the Remedial Action concerning the Site,
  - a. (i) conditions at the Site, previously unknown to EGLE, are discovered after certification of completion by EGLE, (ii) new information previously unknown

to EGLE is received after certification of completion by EGLE, or (iii) EGLE adopts one or more new, more restrictive cleanup criteria for 1,4-dioxane pursuant to Part 201, after certification of completion by EGLE; and

b. these previously unknown conditions, new information, and/or change in criteria indicate that the Remedial Action is not protective of the public health, safety, welfare, and the environment.

If EGLE adopts one or more new, more restrictive, cleanup criteria, EGLE's rights in Sections XVIII.E.1 and E.2 shall also be subject to Defendant's right to seek another site-specific criterion(ia) that is protective of public health, safety, welfare, and the environment and/or to argue that EGLE has not made the demonstration(s) required under this Section.

B. Nothing in this Order shall in any manner restrict or limit the nature or scope of Response Activities that may be taken by EGLE in fulfilling its responsibilities under federal and state law, and this Order does not release, waive, limit, or impair in any manner the claims, rights, remedies, or defenses of EGLE against a person or entity not a party to this Order.

C. Except as expressly provided in this Order, EGLE reserves all other rights and defenses that they may have, and this Order is without prejudice, and shall not be construed to waive, estop, or otherwise diminish EGLE's right to seek other relief with respect to all matters other than Covered Matters.

### **XIX. RIGHTS RESERVED TO DEFENDANT**

A. Notwithstanding any other provision in this Order, in the event Plaintiffs institute proceedings as allowed under Section XVIII.A., and except to the extent decided by this Order,

Defendant reserves all rights, defenses, or counterclaims that it may have with respect to proceedings instituted by Plaintiffs as allowed under Section XVIII.A.

**XX. INDEMNIFICATION, INSURANCE, AND FINANCIAL ASSURANCE**

A. Defendant shall indemnify and save and hold harmless the State of Michigan and its departments, agencies, officials, agents, employees, contractors, and representatives from any and all claims or causes of action arising from, or on account of, acts or omissions of Defendant, its officers, employees, agents, and any persons acting on its behalf or under its control in carrying out Remedial Action pursuant to this Order. EGLE shall not be held out as a party to any contract entered into by or on behalf of Defendant in carrying out activities pursuant to this Order. Neither the Defendant nor any contractor shall be considered an agent of EGLE. Defendant shall not indemnify or save and hold harmless Plaintiffs from their own negligence pursuant to this Section.

B. Prior to commencing any Remedial Action on the Gelman Property, Defendant shall secure, and shall maintain for the duration of the Remedial Action, comprehensive general liability insurance with limits of \$1,000,000.00, combined single limit, naming as an additional insured the State of Michigan. If Defendant demonstrates by evidence satisfactory to EGLE that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering the same risks but in a lesser amount, then with respect to that contractor or subcontractor, Defendant need provide only that portion, if any, of the insurance described above that is not maintained by the contractor or subcontractor.

C. Financial Assurance

1. Defendant shall be responsible for providing and maintaining financial assurance in a mechanism approved by EGLE in an amount sufficient to cover the estimated cost to assure performance of the response activities required to meet the remedial objectives of this Order including, but not limited to, investigation, monitoring, operation and maintenance, and other costs (collectively referred to as “Long-Term Remedial Action Costs”). Defendant shall continuously maintain a financial assurance mechanism (“FAM”) until EGLE’s Remediation and Redevelopment Division (“RRD”) Chief or his or her authorized representative notifies it in writing that it is no longer required to maintain a FAM.

2. The Letter of Credit provided in Attachment K is the initial FAM approved by EGLE. Defendant shall be responsible for providing and maintaining financial assurance in a mechanism acceptable to EGLE to assure the performance of the Long Term Remedial Action Costs required by Defendant’s selected remedial action.

3. The FAM shall remain in an amount sufficient to cover Long Term Remedial Action Costs for a 30-year period. Unless Defendant opts to use and satisfies the Financial Test or Financial Test/Corporate Guarantee as provided in Section XX.C.8, the FAM shall remain in a form that allows EGLE to immediately contract for the response activities for which financial assurance is required in the event Defendant fails to implement the required tasks, subject to Defendant’s rights under Sections XIV and XVI.

4. Within 120 days of the Effective Date of this Order, Defendant shall provide EGLE with an estimate of the amount of funds necessary to assure Long Term Remedial Action Costs for the following 30-year period based upon an annual estimate of costs for the response activities required by this Order as if they were to be conducted by a person under

contract to EGLE (the “Updated Long Term Remedial Action Cost Estimate”). The Updated Long Term Remedial Action Cost Estimate shall include all assumptions and calculations used in preparing the cost estimate and shall be signed by an authorized representative of Defendant who shall confirm the validity of the data. Defendant may only use a present worth analysis if an interest accruing FAM is selected. Within 60 days after Defendant’s submittal of the Updated Long Term Remedial Action Cost Estimate, Defendant shall capitalize or revise the FAM in a manner acceptable to EGLE to address Long Term Remedial Action Costs unless otherwise notified by EGLE. If EGLE disagrees with the conclusions of the Updated Long Term Remedial Action Cost Estimate, Defendant shall capitalize the FAM to a level acceptable to EGLE within 30 days of EGLE notification, subject to Dispute Resolution under Section XVI.

5. Sixty days prior to the 5-year anniversary of the Effective Date of this Order and each subsequent 5-year anniversary, Defendant shall provide to EGLE a report containing the actual Long Term Remedial Action Costs for the previous 5-year period and an estimate of the amount of funds necessary to assure Long Term Remedial Action Costs for the following 30-year period given the financial trends in existence at the time of preparation of the report (“Long Term Remedial Action Cost Report”). The cost estimate shall be based upon an annual estimate of maximum costs for the response activities required by this Order as if they were to be conducted by a person under contract to EGLE, provided that, if Defendant is using the Financial Test or Corporate Guarantee/Financial Test under Section XX.C.8, below, Defendant may use an estimate on its internal costs to satisfy the Financial Test. The Long Term Remedial Action Cost Report shall also include all assumptions and calculations used in preparing the necessary cost estimate and shall be signed by an authorized representative of

Defendant who shall confirm the validity of the data. Defendant may only use a present worth analysis if an interest accruing FAM is selected.

6. Within 60 days after Defendant's submittal of the Long Term Remedial Action Cost Report to EGLE, Defendant shall capitalize or revise the FAM in a manner acceptable to EGLE to address Long Term Remedial Action Costs consistent with the conclusions of the Long Term Remedial Action Cost Report unless otherwise notified by EGLE. If EGLE disagrees with the conclusions of the Long Term Remedial Action Cost Report, Defendant shall capitalize the FAM to a level acceptable to EGLE within 30 days of EGLE notification, subject to dispute resolution under Section XVI. If, at any time, EGLE determines that the FAM does not secure sufficient funds to address Long Term Remedial Action Costs, Defendant shall capitalize the FAM or provide an alternate FAM to secure any additional costs within 30 days of request by EGLE, subject to dispute resolution under Section XVI.

7. If, pursuant to the Long Term Remedial Action Cost Report, Defendant can demonstrate that the FAM provides funds in excess of those needed for Long Term Remedial Action Costs, Defendant may request a modification in the amount. Any requested FAM modifications must be accompanied by a demonstration that the proposed FAM provides adequate funds to address future Long Term Remedial Action Costs. Upon EGLE approval of the request, Defendant may modify the FAM as approved by EGLE. Modifications to the FAM pursuant to this Section shall be approved by EGLE RRD Chief or his or her authorized representative, subject to dispute resolution under Section XVI.

8. If Defendant chooses to use the Financial Test or Corporate Guarantee/Financial Test attached as Attachment L (hereinafter, the term "Financial Test" refers to both an independent financial test or a financial test utilized in conjunction with a corporate

guarantee), Defendant shall, within 90 days after the end of Defendant's next fiscal year and the end of each succeeding fiscal year, submit to EGLE the necessary forms and supporting documents to demonstrate to the satisfaction of EGLE that Defendant can continue to meet the Financial Test requirements. If Defendant can no longer meet the financial test requirements, Defendant shall submit a proposal for an alternate FAM to satisfy its financial obligations with respect to this Order.

9. If the Financial Test is being used as the FAM, EGLE, based on a reasonable belief that Defendant may no longer meet the requirements for the Financial Test, may require reports of financial condition at any time from Defendant, and/or require Defendant to submit updated Financial Test information to determine whether it meets the Financial Test criteria. Defendant shall provide, with reasonable promptness to EGLE, any other data and information that may reasonably be expected to materially adversely affect Defendant's ability to meet the Financial Test requirements. If EGLE finds that Defendant no longer meets the Financial Test requirements, Defendant shall, within 30 days after notification from EGLE, submit a proposal for an alternate FAM to satisfy its financial obligations with respect to this Order, subject to dispute resolution under Section XVI.

10. If the Financial Test/Corporate Guarantee is used as the FAM, Defendant shall comply with the terms of the Corporate Guarantee. The Corporate Guarantee shall remain in place until Long-Term Remedial Action Costs are no longer required or Defendant establishes an alternate FAM acceptable to EGLE.

11. If Defendant wishes to change the type of FAM or establish a new FAM, Defendant shall submit a request to EGLE for approval. Upon EGLE approval of the request, Defendant may change the type of FAM or establish the new FAM as approved by EGLE.



Modifications to the FAM pursuant to this Section shall be approved by EGLE RRD Chief or his or her authorized representative, subject to dispute resolution under Section XVI.

12. If Defendant dissolves or otherwise ceases to conduct business and fails to make arrangements acceptable to EGLE for the continued implementation of all activities required by this Order, all rights under this Order regarding the FAM shall immediately and automatically vest in EGLE in accordance with the FAM.

### **XXI. ONGOING ROLE AND RIGHTS OF INTERVENORS**

A. Termination of Response Activities. Before terminating or significantly reducing the response activities described in Sections V.A.3.f (Evergreen/Parklake), V.A.9 (Wagner Road), V.C.1 (Termination of Groundwater Systems), and VI.C.1–4 (Gelman Property Source Control) of this Order:

1. Defendant shall provide each Intervenor with its analysis supporting its position that the relevant response activity can be terminated or significantly reduced under the criteria listed in those 2021 Order Sections when Defendant provides that analysis to EGLE;
2. EGLE shall consult with the Intervenors and consider in good faith their comments and concerns with respect to the proposed termination/reduction of the response activities;
3. After such consultation, EGLE shall provide each of the Intervenors its written response to Defendant’s analysis when it provides that response to Defendant; and
4. Any Intervenor may invoke dispute resolution under Section XVI of this Order if it disagrees with EGLE’s response, and may fully participate in any

dispute resolution process invoked by Defendant under Section XVI of this Order.

B. Prohibition Zone Boundary Modification. With regard to modification of the boundaries of the Prohibition Zone established by Section V.A.2, by application of either Sections V.A.2.f (Prohibition Zone Expansion) or V.A.6 (Prohibition Zone Boundary Review):

1. The Parties shall provide each Intervenor with all court filings filed pursuant to Sections V.A.2.f and/or V.A.6;
2. EGLE shall consult with Intervenors and consider in good faith their comments and concerns with respect to the proposed modification of the Prohibition Zone boundaries prior to filing any such filings with the Court; and
3. Any Intervenor may participate fully in the court proceedings, including filing briefs and other documents to inform the Court of their comments and concerns.

C. Modification of Termination or Cleanup Criteria. With regard to modification of the termination or cleanup criteria under Section V.C:

1. Defendant shall provide each Intervenor with any proposal prepared pursuant to Section V.C.2.b when it provides the proposal to EGLE, together with all supporting documentation;
2. EGLE shall consult with Intervenors and consider in good faith their comments and concerns with respect to the proposed modification of the termination or cleanup criteria;

3. Following such consultation, EGLE shall provide Intervenors its response to Defendant's proposal when it provides the response to Defendant;
4. Any Intervenor may invoke the dispute resolution procedures described in Section XVI of this Order if it disagrees with EGLE's position. Moreover, any Intervenor may participate fully in any dispute resolution process initiated by Defendant under Section XVI of this Order; and
5. If Defendant invokes the procedures set forth in Section V.C.3:
  - a. EGLE shall consult with Intervenors with respect to EGLE's selection of its panel member under Section V.C.3.a;
  - b. Intervenors may provide the scientific advisory panel with any submissions requested by the panel under Section V.C.3.b;
  - c. EGLE shall provide to Intervenors their response to the scientific advisory panel's recommendations when it provides said response to Defendant pursuant to Section V.C.3.c; and
  - d. Any Intervenor may invoke the dispute resolution procedures described in Sections V.C.3.c and XVI of this Order if it disagrees with EGLE's position and may participate fully in any dispute resolution process invoked by Defendant under Sections V.C.3.c and XVI of this Order.

D. Termination of Post-Termination Monitoring. With regard to termination of post-termination monitoring under Section V.D of this Order:

1. Defendant shall provide a copy of any request to terminate post-termination monitoring under V.D to each Intervenor when it submits its request to EGLE;
  2. EGLE shall consult with Intervenors and consider in good faith their comments and concerns with respect to the proposed termination of the post-termination monitoring;
  3. Following such consultation, EGLE shall provide to Intervenors its written response to any request to terminate post-termination monitoring under V.D when it provides the response to Defendant; and
  4. Any Intervenor may invoke dispute resolution under Section XVI of this Order if it disagrees with EGLE's response and may participate fully in any dispute resolution process invoked by Defendant under Section XVI.
- E. Groundwater-Surface Water Work Plans. To the extent Defendant is required to submit a work plan(s) describing Response Activities and/or evaluations to be implemented/undertaken to address any area where groundwater is venting to surface water with 1,4-dioxane in concentrations that exceed the Generic GSI Criterion with respect to either the Eastern Area or Western Area, EGLE shall consult with Intervenors and consider in good faith their comments and concerns with respect to the adequacy of the proposed Response Activities and/or evaluations.
- F. Groundwater-Stormwater System Work Plans. To the extent Defendant is required to submit a work plan(s) describing Response Activities and/or evaluations to be implemented/undertaken to address any area where groundwater with 1,4-dioxane

at a detectible level is venting to or infiltrating into a municipal stormwater or storm sewer system, including drains of the Washtenaw County Water Resources Commission, EGLE shall consult with Intervenors and consider in good faith their comments and concerns with respect to the adequacy of the proposed Response Activities and/or evaluations.

G. Financial Assurance Mechanism (“FAM”) Requirements. If EGLE is required to make a decision under Section XX.C of this Order, including but not limited to a determination as to the adequacy of the amount of the FAM submitted by the Defendant, approval of Defendant’s periodic calculation of long-term cleanup costs, approval of a conversion of the form of the FAM, or a determination that Defendant is no longer required to maintain a FAM:

1. EGLE shall notify and consult with the Intervenors and consider in good faith their comments and concerns with respect to the determination being made by EGLE; and
2. Any Intervenor may invoke dispute resolution under Section XVI of this Order if it disagrees with EGLE’s determination, and may participate fully in any dispute resolution process invoked by Defendant under Section XVI related to a determination by EGLE under Section XX.C.

H. Certification and Termination. When Defendant submits its Notification of Completion and draft final report under Section XXVI.A:

1. Defendant shall provide a copy of its Notification of Completion and draft final report to each Intervenor when it submits these documents to EGLE;

2. EGLE shall consult with Intervenors and consider in good faith their comments and concerns with respect to the Notice of Completion and draft final report;
  3. After such consultation, EGLE shall provide its Certificate of Completion to each Intervenor when it provides the Certificate to Defendant;
  4. Any Intervenor may invoke dispute resolution under Section XVI of this Order if it disagrees with EGLE's issuance of a Certificate of Completion, and may fully participate in any dispute resolution process invoked by Defendant under Section XVI related to EGLE's failure to issue such Certificate.
- I. Modification of this Order. This Order may not be modified by stipulation, under Section XXV or otherwise, unless each of the Intervenors stipulates to the modification.
- J. Use of Public Lands and Rights-of-Way by Defendant. Because Defendant must continue to occupy properties and public rights-of-way owned or under the control of one or more of the Intervenors for wells and other facilities, and will be required to place additional wells and other facilities on properties and public rights-of-way owned or under the control of one or more of the Intervenors, and because Intervenors require Defendant to get and comply with the others of permits and/or licenses to occupy those lands for those purposes, Defendant or an Intervenor may invoke dispute resolution under Section XVI of this Order to resolve disputes related to Defendant's use of the Intervenor's properties and/or public rights-of-way for its facilities.

K. Participation in any Dispute Resolution under Section XVI. Except as otherwise provided herein, if any dispute arises between any of the Intervenor and either Plaintiff or Defendant regarding matters covered by this Order, the matter will be subject to the dispute resolution procedures under Section XVI of this Order. The Intervenor also shall be notified and shall have the right to participate fully and shall be provided all documents and other matters exchanged in any dispute resolution proceeding under Section XVI regarding any dispute that arises under this Order between Plaintiff and Defendant, and in any subsequent petitions or other proceedings before the court.

## **XXII. RECORD RETENTION**

Defendant, Plaintiff, and their representatives, consultants, and contractors shall preserve and retain, during the pendency of this Order and for a period of ten years after its termination, all records, sampling or test results, charts, and other documents that are maintained or generated pursuant to any requirement of this Order, including, but not limited to, documents reflecting the results of any sampling or tests or other data or information generated or acquired by Plaintiff or Defendant, or on their behalf, with respect to the implementation of this Order. After the ten-year period of document retention, the Defendant and its successors shall notify EGLE, in writing, at least 90 days prior to the destruction of such documents or records, and upon request, the Defendant and/or its successor shall relinquish custody of all records and documents to EGLE.

### **XXIII. ACCESS TO INFORMATION**

A. Upon request, EGLE and Defendant shall provide to each other copies of or access to all non-privileged documents and information within their possession and/or control or that of their employees, contractors, agents, or representatives, relating to activities at the Site or to the implementation of this Order, including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information related to the Remedial Action. Upon request, Defendant shall also make available to EGLE, their employees, contractors, agents, or representatives with knowledge or relevant facts concerning the performance of the Remedial Action. The Plaintiffs shall treat as confidential all documents provided to Plaintiffs by the Defendant marked “confidential” or “proprietary.”

B. Within 60 days of entry of this Order and to the extent not previously provided, Defendant shall provide EGLE with all technical analyses and environmental or engineering studies or reports related to its Response Activities at the Site. This information shall include, but it is not limited to, the following: a) pump test results and capture zone analysis for all extraction wells; b) analytical results from all soil and groundwater testing at the Site; c) all reports and analysis of groundwater flow and modeling; d) all maps depicting the current Site area, delineation of soil and groundwater contamination, Prohibition Zone boundary and all monitoring and extraction well locations; e) Defendant’s 1,4-dioxane transport model, including underlying assumptions regarding advective movement, retardation (adsorption), degradation, diffusion and dispersion; f) all results of pilot tests for any remedial activity; g) all hydrogeological assessments/investigations or contingency plans created by Defendant; h) all



GSI compliance plans; and i) all remedial design data and related assumptions and analyses. The information provided by Defendant shall be promptly posted by EGLE on its Gelman website.

C. Within 60 days of entry of this Order, Defendant shall establish a cloud-based database designed specifically for the storage and validation of data and information associated with all monitoring wells, extraction wells and NPDES treatment and discharge activity. The data shall include identifying information for each well, including address, GPS, X and Y coordinates, top of casing and ground elevations, well logs and lithology, well and screen depths and survey information. This database will be identical to the database maintained by Gelman and will include all historical as well as future information. The information should be available for read-only electronic download in one or more native Excel files (or in a successor program to Excel provided that when the data are migrated to a new program, no data are lost). The database shall be updated by Defendant on a monthly basis. Defendant is required to investigate and remedy any data gaps or discrepancies identified by the Intervenors or members of the public. If information needed to fill data gaps is not available, Defendant will explain why the information is not available.

#### **XXIV. NOTICES**

Whenever under the terms of this Order notice is required to be given or a report, sampling data, analysis, or other document is required to be forwarded by one Party to the other, such notice or document shall be directed to the following individuals at the specified addresses or at such other address as may subsequently be designated in writing:

For Plaintiffs:

Daniel Hamel  
Project Coordinator  
Michigan Department

For Defendants:

Lawrence Gelb  
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642 South Wagner Road

of Environment, Great  
Lakes, and Energy,  
Remediation and Redevelopment  
Division  
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and

and

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Ann Arbor, Michigan 48104  
(734) 662-4426

Any party may substitute for those designated to receive such notices by providing prior written notice to the other parties.

#### **XXV. MODIFICATION**

The Response Activities and Remedial Actions required by this Order are not static, but are initial requirements based on the current scientific and technical understanding of 1,4-dioxane that is present at and that has migrated from the Gelman Property. As more information and data become available in the future, it may be appropriate to modify this Order to increase or decrease the required Response Activities and Remedial Actions. As examples: Data from monitoring wells required herein may show the need for additional monitoring wells or other investigations to define the extent and subsurface transport of 1,4-dioxane; or Data from extraction wells or related to other Remedial Actions may show that added extraction or Remedial Actions may be needed in some areas and less may be appropriate in other areas. Any such modifications to this Order may be proposed by Plaintiff, by Defendant or by one or more of the Intervenor, and shall be subject to the dispute resolution provisions in Section XVI.

This Order may not be modified except by order of this Court. Remedial Plans, work plans, or other submissions made pursuant to this Order may be modified by mutual agreement of the Defendant and EGLE, subject to the ongoing rights of the Intervenor under Section XXI of this Order.

#### **XXVI. CERTIFICATION AND TERMINATION**

A. When Defendant determines that it has completed all Remedial Action required by this Order, Defendant shall submit to EGLE a Notification of Completion and a draft final report. The draft final report must summarize all Remedial Action performed under this Order and the performance levels achieved. The draft final report shall include or refer to any supporting documentation.

B. Upon receipt of the Notification of Completion, EGLE will review the Notification of Completion and the accompanying draft final report, any supporting documentation, and the actual Remedial Action performed pursuant to this Order. After conducting this review, and not later than three months after receipt of the Notification of Completion, EGLE shall issue a Certificate of Completion upon a determination by EGLE that Defendant has completed satisfactorily all requirements of this Consent Decree, including, but not limited to, completion of all Remedial Action, achievement of all termination and treatment standards required by this Order, compliance with all terms and conditions of this Order, and payment of any and all stipulated penalties owed to EGLE. If EGLE does not respond to the Notification of Completion within three months after receipt of the Notification of Completion, Defendant may submit the matter to dispute resolution pursuant to Section XVI. This Order shall terminate upon motion and order of this Court after issuance of the Certificate of Completion. Upon issuance, the Certificate of Completion may be recorded.

**XXVII. EFFECTIVE DATE**

The effective date of this Order is the date it is entered by the Court.

**XXVIII. SEVERABILITY**

The provisions of this Order shall be severable. Should any provision be declared by a court of competent jurisdiction to be inconsistent with federal or state law, and therefore unenforceable, the remaining provisions of this Order shall remain in full force and effect.

# *EXHIBIT N*

Gelman Sciences Inc	Washnetaw	GELSC	3663 ELIZABETH	LLJ08442	6/17/2020 10:53:00 AM	6/18/2020 3:39:38 PM	DIOXANE,1,4- 123-91-1	CXPDJ	0.001	0.002	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washnetaw	GELSC	3663 ELIZABETH	LLJ19690	8/24/2020 11:46:00 AM	8/25/2020 8:32:33 AM	DIOXANE,1,4- 123-91-1	CXPDJ	0.001	0.002	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washnetaw	GELSC	3674 ELIZABETH	LLJ08452	6/17/2020 10:35:00 AM	6/18/2020 3:39:42 PM	DIOXANE,1,4- 123-91-1	CXPDJ	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washnetaw	GELSC	3674 ELIZABETH	LLJ19699	8/24/2020 12:00:00 PM	8/25/2020 8:32:32 AM	DIOXANE,1,4- 123-91-1	CXPDJ	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washnetaw	GELSC	3686 ELIZABETH	LLJ08458	6/17/2020 10:32:00 AM	6/18/2020 3:39:45 PM	DIOXANE,1,4- 123-91-1	CXPDJ	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washnetaw	GELSC	3686 ELIZABETH	LLJ19693	8/24/2020 11:25:00 AM	8/25/2020 8:32:35 AM	DIOXANE,1,4- 123-91-1	CXPDJ	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washnetaw	GELSC	3600 ELIZABETH	LLJ19702	8/24/2020 11:17:00 AM	8/25/2020 8:32:42 AM	DIOXANE,1,4- 123-91-1	CXPDJ	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washnetaw	GELSC	3639 ELIZABETH	LLJ08466	6/17/2020 10:10:00 AM	6/18/2020 3:39:39 PM	DIOXANE,1,4- 123-91-1	CXPDJ	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washnetaw	GELSC	3639 ELIZABETH	LLJ19695	8/24/2020 10:41:00 AM	8/25/2020 8:32:29 AM	DIOXANE,1,4- 123-91-1	CXPDJ	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washnetaw	GELSC	3652 ELIZABETH	LLJ08460	6/17/2020 10:08:00 AM	6/18/2020 3:39:46 PM	DIOXANE,1,4- 123-91-1	CXPDJ	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washnetaw	GELSC	3652 ELIZABETH	LLJ19697	8/24/2020 10:47:00 AM	8/25/2020 8:32:38 AM	DIOXANE,1,4- 123-91-1	CXPDJ	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washnetaw	GELSC	3669 ELIZABETH	LLJ08460	6/17/2020 9:34:00 AM	6/18/2020 3:39:41 PM	DIOXANE,1,4- 123-91-1	CXPDJ	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.

Gelman Sciences Inc	Washitenaw	GELSC	3669 ELIZABETH	LLJ19705	8/24/2020	8/25/2020	DIOXANE, 1,4-	123-91-1	CXPDX	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washitenaw	GELSC	3786 ELIZABETH	LLJ08440	6/17/2020	6/18/2020	DIOXANE, 1,4-	123-91-1	CXPDX	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washitenaw	GELSC	3786 ELIZABETH	LLJ19688	8/24/2020	8/25/2020	DIOXANE, 1,4-	123-91-1	CXPDX	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washitenaw	GELSC	3789 ELIZABETH	LLJ08448	6/17/2020	6/18/2020	DIOXANE, 1,4-	123-91-1	CXPDX	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washitenaw	GELSC	3789 ELIZABETH	LLJ19699	8/24/2020	8/25/2020	DIOXANE, 1,4-	123-91-1	CXPDX	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washitenaw	GELSC	3666 ELIZABETH - NEW	LLJ08453	6/17/2020	6/18/2020	DIOXANE, 1,4-	123-91-1	CXPDX	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washitenaw	GELSC	3666 ELIZABETH - NEW	LLJ19696	8/24/2020	8/25/2020	DIOXANE, 1,4-	123-91-1	CXPDX	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washitenaw	GELSC	3500 ELIZABETH - NEW	LLJ08472	6/17/2020	6/18/2020	DIOXANE, 1,4-	123-91-1	CXPDX	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washitenaw	GELSC	3500 ELIZABETH - NEW	LLJ19698	8/24/2020	8/25/2020	DIOXANE, 1,4-	123-91-1	CXPDX	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washitenaw	GELSC	3601 ELIZABETH - NEW	LLJ08457	6/17/2020	6/18/2020	DIOXANE, 1,4-	123-91-1	CXPDX	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washitenaw	GELSC	3601 ELIZABETH - NEW	LLJ19694	8/24/2020	8/25/2020	DIOXANE, 1,4-	123-91-1	CXPDX	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washitenaw	GELSC	3573 ELIZABETH - NEW	LLJ08452	6/17/2020	6/18/2020	DIOXANE, 1,4-	123-91-1	CXPDX	0.001	0.002	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.



Gelman Sciences Inc	Washhenaw	GELSC	3673 ELIZABETH - NEW 164FT	LLJ19691	8/24/2020 11:40:00 AM	8/25/2020 8:32:34 AM	DIOXANE,1,4	123-91-1	CXPDJ	0.001	0.002	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washhenaw	GELSC	3550 ELIZABETH - NEW 165FT WELL	LLJ08445	6/17/2020 10:48:00 AM	6/18/2020 3:39:39 PM	DIOXANE,1,4	123-91-1	CXPDJ	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washhenaw	GELSC	3550 ELIZABETH - NEW 165FT WELL	LLJ19695	8/24/2020 11:33:00 AM	8/25/2020 8:32:37 AM	DIOXANE,1,4	123-91-1	CXPDJ	0.001	0.001	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washhenaw	GELSC	3627 ELIZABETH - NEW 170FT WELL	LLJ08451	6/17/2020 12:00:00 AM	6/18/2020 3:39:42 PM	DIOXANE,1,4	123-91-1	CXPDJ	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washhenaw	GELSC	3627 ELIZABETH - NEW 170FT WELL	LLJ19700	8/24/2020 10:52:00 AM	8/25/2020 8:32:47 AM	DIOXANE,1,4	123-91-1	CXPDJ	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washhenaw	GELSC	3630 ELIZABETH - NEW 196FT WELL	LLJ08444	6/17/2020 10:58:00 AM	6/18/2020 3:39:38 PM	DIOXANE,1,4	123-91-1	CXPDJ	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washhenaw	GELSC	3750 ELIZABETH - NEW 79FT WELL	LLJ08459	6/16/2020 10:01:00 AM	6/18/2020 3:39:46 PM	DIOXANE,1,4	123-91-1	CXPDJ	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washhenaw	GELSC	3750 ELIZABETH - NEW 79FT WELL	LLJ19701	8/24/2020 10:15:00 AM	8/25/2020 8:32:42 AM	DIOXANE,1,4	123-91-1	CXPDJ	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washhenaw	GELSC	3615 ELIZABETH - NEW 96FT WELL	LLJ08441	6/17/2020 10:20:00 AM	6/18/2020 3:39:37 PM	DIOXANE,1,4	123-91-1	CXPDJ	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washhenaw	GELSC	3615 ELIZABETH - NEW 96FT WELL	LLJ19687	8/24/2020 11:05:00 AM	8/25/2020 8:32:30 AM	DIOXANE,1,4	123-91-1	CXPDJ	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washhenaw	GELSC	3618 ELIZABETH - NEW WELL	LLJ08443	6/17/2020 10:22:00 AM	6/18/2020 3:39:38 PM	DIOXANE,1,4	123-91-1	CXPDJ	0.001	ND	mg/L 8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Gelman Sciences Inc	Washhenaw	GELSC	3618 ELIZABETH - NEW WELL	LLJ08782	6/17/2020 2:00:30 PM	6/22/2020 8:56:00 AM	PCB (arodcls)	136-36-3	CXPT3	0.0001	ND	mg/L EPA 525.3	
Gelman Sciences Inc	Washhenaw	GELSC	3618 ELIZABETH - NEW WELL	LLJ08782	6/17/2020 2:00:30 PM	6/22/2020 8:56:00 AM	METHOXYCH	72-43-5	CXPT3	0.0001	ND	mg/L EPA 525.3	
Gelman Sciences Inc	Washhenaw	GELSC	3618 ELIZABETH - NEW WELL	LLJ08782	6/17/2020 2:00:30 PM	6/22/2020 8:56:00 AM	HEXACHLOR TADIENE	77-47-4	CXPT3	0.0002	ND	mg/L EPA 525.3	

Geiman Residential Well Sampling - Thru May 2019

Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	DICHLOROPROPENE,1,3-	10061-01-5	CXV02	0.0005	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	CIS	108-98-3	CXV02	0.0005	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	CHLOROBENZENE	108-90-7	CXV02	0.0005	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	DICHLOROPROPANE,1,3-	142-28-9	CXV02	0.0005	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	DICHLOROETHYLENE,1,2-TRANS	156-50-5	CXV02	0.0005	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	DICHLOROBENZENE,1,3-	541-73-1	CXV02	0.0005	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	CARBON	56-23-6	CXV02	0.0005	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	TETRACHLORIDE	563-58-6	CXV02	0.0005	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	DICHLOROPROPENE,1,1-	594-20-7	CXV02	0.0005	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	DICHLOROPROPANE,2,2-	67-66-3	CXV02	0.0005	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	CHLOROFORM	74-87-3	CXV02	0.0005	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	TRICHLOROETHANE,1,1,1-	74-55-6	CXV02	0.0005	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	CHLOROMETHANE	74-87-3	CXV02	0.0005	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	VINYL CHLORIDE	75-01-4	CXV02	0.0005	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	TRICHLOROETHANE,1,1,2-	79-00-5	CXV02	0.0005	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	HEXACHLOROBUTADIENE	87-68-3	CXV02	0.0005	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	TRIMETHYLBENZENE,1,2,	95-63-6	CXV02	0.0005	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	TRICHLOROPROPANE,1,2,	98-18-4	CXV02	0.0005	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	XYLENE,meta-&para-	XYLMP-00-C	CXV02	0.0005	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	METHYL TERT-BUTYL	1634-04-4	CXV02	0.001	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	ETHER	75-69-4	CXV02	0.001	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	FLUOROTRICHLOROMET	75-71-8	CXV02	0.001	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	DICHLORODIFLUOROMET	109-99-9	CXV02	0.005	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4628 BREEZEWOOD	LL137193	5/7/2019 3:28:00 PM	5/10/2019 9:01:41 AM	TETRAHYDROFURAN	123-91-1	CXV02	0.001	ND	mg/L	EPA 524.2	
Geiman Sciences Inc	Washnetaw	GELSC	4670 BREEZEWOOD	LL137163	5/7/2019 3:35:00 PM	5/10/2019 9:00:56 AM	DIOXANE,1,4-	123-91-1	CXV02	0.001	ND	mg/L	8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.
Geiman Sciences Inc	Washnetaw	GELSC	4709 BREEZEWOOD	LL137165	5/7/2019 3:25:00 PM	5/10/2019 9:00:57 AM	DIOXANE,1,4-	123-91-1	CXV02	0.001	0.001	mg/L	8260 SIM	This analysis is performed using selected ion monitoring (SIM). Due to the nature of 1,4-dioxane, results reported below 0.005 mg/L should be considered estimated.