AN ALLETE COMPANY

March 29, 2022

Mr. John Sager
Wisconsin Departement of Natural Resouces
Superior Service Center
1701 N 4th Street
Superior, WI 54880

Dear Mr. Sager:

RE: WDNR Comments on *90% Remedial Action Design Report – Upland Area*

The *90% Remedial Action Design Report - Upland Area (RAD)* was prepared by Foth Infrastructure & Environment LLC (Foth) and submitted to Wisconsin Department of Natural Resources (WDNR) on behalf of Superior Water, Light & Power, (SWL&P) on September 14, 2021. WDNR provided comments in a 90% *RAD* approval letter received via email on December 23, 2021.

Many of the WDNR comments question the ability of the WDNR-approved *Remedial Action Options Report – Upland Area* (*RAOR),* Remedial Option #3, to satisfy WDNR requirements and that the path to Site Closure is uncertain. SWL&P hopes the clarifications in our attached comment/response submittal will adequately address the WDNR comments and answer lingering questions.

With respect to resolving WDNR comments, SWL&P is seeking conditional approval to finalize the Final Upland Remedial Action (RA) Design with anticipated WDNR approval of the Final RA Design about September 30, 2022, so the construction preparations can continue with confidence and the RA Construction can begin about mid-April 2023. Some residual issues related to Site Closure Criteria and Process may remain that can be discussed and resolved following receipt of your conditional approval.

Important areas for discussion relative to your conditional approval include:

- Target Concentrations for Upland RA Elements
  - Soil excavation
  - Biosparge
  - Enhanced monitored natural attenuation (MNA)

- Management of Excavated Soil including Soil from Utility Trenching

- Field Sampling Plan for Upland RA Elements
  - Soil excavation (RAO 1)
  - Biosparge and enhanced MNA (RAO 2)
  - Groundwater monitoring to evaluate MNA (RAO 3)

Areas of discussion relative to Site Closure Criteria include:

- Provisions for additional monitoring and RAs
  - Additional investigation and/or additional RAs
  - Contamination on City of Superior Wastewater Treatment Plant property

- Closure Requirements:
  - Adequate source control
  - RA to the extent technically and economically feasible
  - Groundwater compliance within a reasonable period
  - Case closure obligations

To continue with the remedial design and subsequent RA, SWL&P needs support from WDNR of the selected preferred alternative and associated RA Design, agreement on the RAOs, and agreement on the regulatory and technical path for achieving RAOs and Site Closure.

SWL&P requests that WDNR consider this response, meet with us, preferably in-person to discuss and confirm the path to RAO achievement and Site Closure.

If you have any additional questions, please contact me at (218) 355-3191.

Sincerely,

Greg Prom
Senior Environmental Compliance Specialist

Attachments

cc: Jamie Mehle, SWL&P
Joscelyn Skandel, SWL&P
Erin Hughes, Foth
Steve Laszewski, Foth
Brian Symons, Foth
Bob Kick, Foth

Attachment 1
Response to WDNR 90% Design Comments & Standards

Attachment 1a **Response to WDNR 90% Design Comments**

Attachment 1b **Definitions for Standards**

Attachment 1a
Response to WDNR 90% Design Comments

SWL&P RESPONSE TO DNR COMMENTS ON THE 90% REMEDIAL ACTION DESIGN DELIVERABLES

SWL&P Former MGP Site, Superior, Wisconsin

Revised: Tuesday, March 29, 2022

Comment No.	WDNR Comment per December 23, 2021 Letter	SWL&P Response
	General Comments:	
1	The remedial action design for the upland portion of the Site has focused on the three Remedial Action Objectives (RAOs) formulated by SWL&P and Foth during the selection of the remedial action options. RAOs are used in the CERCLA process and are not defined or used as such in Wis. Adm. Code chs. NR700-799. There are many locations in the reviewed reports that reference achievement of the RAOs will result in closure of the Site under Wis. Adm. Code ch. NR726. Although the RAOs established by Foth and SWL&P may include certain obligations required under Wis. Adm. Code chs. NR700-799, the DNR will evaluate the remedial action against all applicable requirements of Wis. Adm. Code chs. NR700-799 for determination of SWL&P's compliance with its responsibility under Wis. Stats. ch. 292. When referencing closure of the Site in the reviewed reports reference the closure requirements of Wis. Adm. Code ch. NR726.	In the context of the RAOR and the RAD, the term "Remedial Action Objectives" (RAOs) is used to specify the contaminants and media of interest, exposure pathways, and preliminary remediation goals. SWL&P would like to continue using the terms RAOs and has linked the RAOs to the NR700-799 Wis. Adm. Code. The RAOs were developed on the basis of chemical-specific residual cleanup levels (RCLs) and enforcement standards (ESs) from Wis. Adm. Code chs. NR-700-799 and NR140 for soil and groundwater, site-specific conditions, and technology considerations. In adopting the RAOs proposed in the RAOR, SWL&P retained WDNR's autonomy and responsibility to apply all applicable requirements of Wis. Adm. Cod chs. NR700-799 and NR140. The applicable RCLs and ESs were listed in Table 2-1 of the FSP as appropriate regulatory standards for the Site. Throughout the 100% RAD, SWL&P will include further clarifying text when the term "RAOs" is used to emphasize WDNR's responsibility to consider NR700-799 and NR140 requirements in making Site closure decisions.
2	The 'target concentrations' developed by SWL&P and Foth are not environmental standards as that term is defined in Wis. Adm. Code § NR720.03(20) nor are they site-specific Wis. Adm. Code ch. NR720 RCLs (RCLs) for the protection from direct contact, groundwater protection, or environmental protection. The various 'target concentrations' developed by SWL&P and Foth are described using various terms. In places it references them as 'Site specific target concentrations', or 'cleanup standards' or 'environmental standards'. Modify all the descriptions of target concentrations in the reviewed reports to standardize the language and make it very clear these are not environmental standards or Wis. Adm. Code ch. NR720 RCLs. It is perhaps better to define the target concentrations as 'action levels' that were developed during design to guide remedial action so that the applicable cleanup levels in Wis. Adm. Code chs. NR140 and NR720 are achieved.	In the 90% RAD, SWL&P took great care to present definitions of all key terms used, including these definitions in footnotes in the locations they are first used in each document (Terminology Table attached). Foth does not and has not claimed that the Site-Specific Excavation Target Concentrations, the Site-Specific Biosparge Target Concentrations, or the Site-Specific MNA Target Concentrations are environmental standards as that term is defined in Wis. Adm. Code NR 720.03(20). Use of the term "action level" is not recommended as it may be confused with the "vapor action levels" defined or referenced in NR700, NR722, and NR726. Instead, SWL&P has further refined the definition of the terms Site-Specific Excavation Target Concentrations, the Site-Specific Biosparge Target Concentrations, or the Site-Specific MNA Target Concentrations to note that they are not Wis. Adm. Code ch. NR700-799 or NR140 environmental standards established for the protection of groundwater and are not closure endpoint concentrations approved by the WDNR.
	Include a table that summarizes all the various target concentrations developed by SWL&P as well as the Wis. Adm. Code ch. NR720 RCLs for all Site contaminants, not benzene alone. This table should include the applicable media for each target concentration, as well as the basis for each target concentration.	FSP, Table 2-1, summarizes the WDNR environmental standards applicable to soil and groundwater at the Site. The Site-Specific Excavation Target Concentrations, the Site-Specific Biosparge Target Concentrations, or the Site-Specific MNA Target Concentrations established using site-specific data analysis and predictive modeling have been added to Table 2-1 for reference. The methodology for establishing these target concentrations is described in Appendix D-1.
	Also, throughout the document SWL&P refers to an industrial 'shallow' soil D-C RCL. Wis. Adm. Code ch. NR720 defines the soil RCLs in terms of land use and not depth. Refer to the RCLs as they are defined in Wis. Adm. Code.	The RAD has been revised to use the term, "industrial soil D-C RCL" consistently, and eliminate the word "shallow" from the term.

SWL&P RESPONSE TO DNR COMMENTS ON THE 90% REMEDIAL ACTION DESIGN DELIVERABLES

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Comment No.	WDNR Comment per December 23, 2021 Letter	SWL&P Response
3	The DNR believes the contaminated soil that contains concentrations of contamination greater than the Wis. Adm. Code ch. NR720 RCLs for the protection of groundwater is a threat to the environment due to the potential leaching of contaminants to groundwater resulting in further Wis. Adm. Code NR140 Enforcement Standards exceedances (Wis. Adm. Code § NR718.12(1)(c)7). **The DNR is not granting an exemption (Wis. Adm. Code § NR718.12(1)(d)) to the location standards contained in Wis. Adm. Code § NR718.12(1)(c). Therefore, soil contaminated at concentrations greater than the Wis. Adm. Code ch. NR720 RCLs for the protection of groundwater is not to be returned to the excavation.** Edit all subsequent reports to reflect this requirement. The DNR informed you the DNR was not approving replacement of contaminated soil in excavations in its April 16, 2021 letter reviewing the 60% RAD. Based on our December 23, 2021 discussion we understand that you will implement the project complying with these requirements. The DNR will not approve a final RAD if this is carried forward again.	Excavated soil from the former MGP gas holder, former Hortonsphere, or former MGP discharge area excavations will not be used as backfill in on-Site excavations. See Sections 1.5.1, 2.2.1, 2.2.1.1, 2.6.1, 2.6.2, 2.10, 3.1.1, and 4.1.1. This approach added about 1,500 cy of soil to the off-site soil disposal volume, but no pre-treatment would be necessary as these soils have benzene concentration <10 mg/kg. Excavated soil does not include soil removed/replaced during installation of pipe trenches or from general site grading.
4	Throughout the reviewed reports Foth states Site closure can be achieved by excavating soil exceeding the target concentration of 5 mg/kg benzene in the Hortonsphere and Gas Holder Area and actively remediating other areas of the site to other target concentrations. The DNR has not approved the use of 5 mg/kg benzene or the other 'target concentrations' as site specific Wis. Adm. Code ch. NR720 RCLs for this site. Leaving contaminated soil in place or returning excavated contaminated soil back into the excavation at concentrations greater than the Wis. Adm. Code NR720 RCLs for the protection of groundwater may lead to excessive groundwater contamination remaining after the remedial action. Therefore, the DNR is not approving natural attenuation as a final remedial action until a full and complete assessment of remaining contamination both horizontal and vertical in all affected media is conducted following the active remedial action. This includes the Hortonsphere and Gas Holder area.	See Response to Comment #5.
5	In multiple places in the reviewed report Foth asserts natural attenuation will remediate remaining contamination and the Site will close under Wis. Adm Code ch. NR726 following the remedial action. The DNR does not approve this remedial action as the final remedial action for the Site nor will it assume further remedial action is not necessary or is not technically or economically feasible until after active remedial action is completed and adequate monitoring of the Site and assessment of remaining contamination is completed.	The process for monitoring the Site and assessment of remaining contamination is outlined in the RAD including the summary provided in Section 1.5 and Table 1-1, the FSP, and the OM&M Plan. It is understood that WDNR will not approve Site closure until the proposed remedial action and monitoring to achieve RAOs and NR 726 closure requirements have been completed, WDNR has reviewed the monitoring results, and any necessary contingency actions have been completed. Appropriate contingency actions are described in Section 1.6 of the RAD and Section 7 of the OM&M Plan.
6	Throughout the reviewed reports, when referencing calculations used to establish target concentrations, remediation time frames, etc., Foth references information contained in the appendices without giving a specific page or section reference. A brief explanation of the methodology including the assumptions used to derive the target concentrations would greatly improve the text of the report and we suggest including some additional explanatory text in the final RAD.	The requested discussion is provided in the RAOR, Appendix A and the RAD, Appendix D-1 and a brief explanation has been added to the final RAD text. To aid in referencing information in Section 1.5.2 to Appendix D-1, all tables and figures in the appendices have been numbered, labeled, and given a unique page number.

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SWL&P Former MGP Site, Superior, Wisconsin

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Comment No.	WDNR Comment per December 23, 2021 Letter	SWL&P Response
7	Throughout the reviewed reports, Foth uses the terms such as 'non-impacted material' or 'soil' (or similar) to mean soil that is contaminated at concentrations below the Wis. Adm. Code ch. NR720 RCLs for protection from direct contact. Also, Foth does not clearly define the terms 'impacted', 'non-impacted', and 'overburden'. As stated in the DNR's April 16, 2021 letter reviewing the 60% design report, Wis. Admin. Code § NR718.03(5) defines the term 'contaminated soil'. Soil with any detections of contaminants is considered by the DNR to be contaminated. Reference all soil that is contaminated at any concentrations 'impacted' and clearly define what is meant by the terms 'impacted', 'non-impacted', and 'overburden' and standardize the language in all the reviewed reports.	For clarity and consistency, the terms non-impacted and overburden have been removed from all RAD documents including appendices. The following terminology is more consistently used: 1) impacted soil <10 mg/kg benzene, a landfill acceptance limit; and 2) impacted soil >10 mg/kg benzene. References to the industrial soil D-C RCL and the Site-Specific Excavation Target Concentration are not relevant to final disposition of excavated materials.
7	Correct all calculations and models that do not consider the mass of contaminants in the 'non-impacted soil' or 'overburden'.	Calculations and models have been reviewed and revised, as needed, to consider the mass of contaminants within the Limits of Contamination that includes areas with soil concentrations >5.1 ug/kg benzene, which is the groundwater protection RCL, and/or with groundwater concentrations > 5 ug/L, which is the groundwater enforcement standard. See RAD, Appendix B-1, Figure B-1.
	Specific Comments:	
	90% Design Upland Area Remedial Action Design Report	
8	Section 1.1, page 2, last paragraph: This paragraph discusses numeric soil targets based on protection of groundwater but not human health risk from direct contact with soil. Add discussion on this.	The paragraph as been modified as follows: The RD utilized soil data from historic sampling events as a design basis. These soil data are tabulated and illustrated in Appendix B-1. The locations of these soil and groundwater sampling locations are shown on Figure B-1. The data are summarized in tables provided in Attachment 1 which also include applicable references and comparisons to the groundwater protection residual contaminant level (RCL[1]), the Industrial Soil Direct Contact RCL[2], and the NR 140 enforcement standard (ES)[3]. The limits of contamination shown on Figure B-1 for the RA were defined as the area where groundwater concentrations are greater than 5 ug/L (the groundwater ES for benzene) and/or soil concentrations exceeding the groundwater protection RCL for benzene of 5.1 ug/kg. Since the industrial soil D-C RCL for benzene is 7,070 ug/kg which is greater than 5.1 ug/kg, the limits of contamination shown on Figure B-1 also include soil exceeding the industrial soil D-C RCL for benzene. Also, as shown on Figure B-1, the limits of contamination also encompass the soil exceeding the industrial soil D-C RCL for naphthalene (24,100 ug/kg) and benzo(a)pyrene (2,119 ug/kg) which are the other two reference chemicals of concern that effect the overall limits of contamination.
9	Section 1.1 page 2, last sentence: Please explain why the geometric mean is used to characterize average soil concentration rather than the arithmetic mean or the 95% upper confidence limit (UCL) of the arithmetic mean. The use of a geometric mean could lead to underestimating the average soil concentrations. Also, if geometric means were used to determine compliance for soil cleanup, to calculate treatment rates, or to calculate degradation rates, the resulting calculations will also likely result in an underestimate of time to achieve cleanup criteria and ultimately Site closure. See additional comments with further explanation: Appendix B-1, second page, Average Soil Concentrations.	See response to comment #68. Additional statistical analysis was performed and will be provided in Appendix B-1. Average values will be used except for the Biosparge/SVE area where highly variable data better support use of a geometric mean. In the Biosparge/SVE area the geometric mean is utilized due to the degree of variability in the soil data, the relatively small sample size, and the biased sampling scheme. Text in Section 1.1 and the appendices will be updated accordingly.
10	Section 1.1, page 2, footnote 2: The Wis. Adm. Code ch. NR720 RCL for groundwater protection is not based on human health risk from direct contact with soil, it is based on protection of groundwater. This footnote is incorrect and needs to be corrected.	The footnote will be corrected as follows: [1] **Groundwater Protection RCL (NR 720.10)** – A numerical value expressing the concentration of a substance in soil which is based on the anticipated residual contaminant levels in soil being protective of groundwater. These

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Comment No.	WDNR Comment per December 23, 2021 Letter	SWL&P Response
11	Section 1.2 page 3, first paragraph, sixth sentence: This sentence is worded so it appears Option 3 was the DNR's preferred alternative. The DNR provided conditional approval to SWL&P's and Foth's preferred Option 3. Change this sentence to state the remedial option selected is the preferred alternative of SWL&P and Foth.	The text has been modified as follows: provided conditional approval of the *RAOR* on January 28, 2021 (WDNR, 2021) with Option 3 as the preferred remedial option of SWL&P and Foth for the Site with conditional approval from WDNR. The remedial design (RD) process has begun with this *RA Design Report* in accordance
12	Section 1.3 page 4, bullet point "RAO 2" When the asymptotic rate of mass removal is reached using the selected active remedial option, it does not necessarily demonstrate that active remedial action is completed. If contaminant concentrations are not adequately reduced another active remedy may need to be considered.	Sites with residual soil contaminant concentrations that equal or exceed residual contaminant levels (RCLs), as determined under Wis. Admin. Code ch. NR 720, may be granted case closure if: • soil contamination was adequately characterized for all pathways of concern, per Wis. Admin. Code § NR 726.09(2); • there is no threat to human health or the environment per Wis. Admin. Code § NR 726.05(4); and • remediation has been completed to the extent technically and economically feasible per Wis. Admin. Code ch. NR 722
13	Section 1.4, page 5, bulleted list: Wis. Adm. Code § NR726.05(6)(b) requires that natural attenuation will bring the groundwater into compliance with Wis. Adm. Code ch. NR 140 groundwater quality standards within a reasonable period of time, considering the criteria in Wis. Adm. Code § NR722.07 is a requirement for Site closure with remaining groundwater contamination. Add demonstration of reasonable timeframe to achieve groundwater quality standards as a bullet.	The following bullet has been added to Section 1.4, per this request. The performance modeling for biosparge, enhanced MNA, and MNA effectiveness indicates the time to achieve the groundwater ES would be about 15 to 30 years. The quantitative trend toward this long-term goal could be determined using 8 quarterly groundwater sampling events. • The post-active RA groundwater monitoring program will provide data to demonstrate whether the groundwater ES for COCs can be achieved through MNA in a reasonable time frame.
14	Section 1.4, page 5, third bullet: It has not been shown that cleanup to the requirements of Wis. Adm. Code ch. NR140 groundwater quality standards is not technically or economically feasible at this Site. The DNR agrees that attainment of the Wis. Adm. Code ch. NR140 groundwater quality standards may not be achievable with the selected active remedial action, however, adequate monitoring following the active remedial action may show that attainment of the Wis. Adm. Code ch. NR140 groundwater quality standards are achievable through natural attenuation or another remedial action.	It has been shown in the RAOR that cleanup to the requirements of NR140 groundwater quality standards is not technically or economically feasible at this Site. We agree that attainment of the Wis. Adm. Code ch. NR140 groundwater quality standards may not be achievable and that WDNR's statement is accurate, however we would also like WDNR to acknowledge the other closure options provided in NR720. "The DNR agrees that attainment of the Wis. Adm. Code ch. NR140 groundwater quality standards may not be achievable with the selected active remedial action, however, adequate monitoring following the active remedial action may show that attainment of the Wis. Adm. Code ch. NR140 groundwater quality standards are achievable through natural attenuation, another remedial action, or *another closure option provided in NR720."*

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Revised: Tuesday, March 29, 2022

Comment No.	WDNR Comment per December 23, 2021 Letter	SWL&P Response
15	Section 1.4, page 5, first paragraph, third sentence: The DNR does not agree that the contamination detected in the area of the City of Superior Wastewater Treatment Plants is "likely due to facility construction and fill activities unrelated to MGP operations". This has not been shown to be the case through the SI activities conducted to date. The DNR does concur that the infrastructure in this area of the Site limits options for active remedial action. Further monitoring during and following active remedial action will be used to evaluate this area of the Site to determine what additional actions, if any, are warranted for compliance with Wis. Adm. Code chs. NR700-799 and Wis. Stats. ch. 292. Remove the phrase "likely due to facility construction and fill activities unrelated to MGP operations".	The referenced phrase was not removed from the document. The available figures and data do not show connection of discontinuous and anomalous contaminants between the MGP site and the City's WWTP. The City constructed the WWTP about 1974 with fill. The source and quality of that fill has not been provided to SWL&P in any available documentation. Furthermore, there has been no documentation that no other chemical releases on City WWTP property have occurred that would account for the anomalous contaminants. (See revised Figure 1 - Limits of Soil and Groundwater Contamination)
16	Section 1.5, page 6, title: Retitle this section to include monitoring to achieve Wis. Adm. Code ch. NR726 closure requirements.	Section title has been updated as requested: **1.5 Monitoring to Achieve RAOs and NR 726 Closure Requirements**
17	Section 1.5 page 7, first bullet, last two sentences: The statements that the RA will leave "limited residual contamination" and "the residual subsurface soils impacts will not present an unacceptable groundwater contaminant risk" are based on modeled predictions and not actual results as measured post-remediation. Modify these statements in the RAD to clarify that they are predictions based on pre-remedial modeling, unless adequate quantification of expected residual impacts can be stated with certainty and include documentation of the specific data used to make these assumptions. A section needs to be added to the RAD to discuss this topic in detail. This section should include information on post-remediation monitoring that will be done to confirm residual contaminant concentrations after the active remedial action is complete.	"The basic elements of the approach for achieving the RAOs and site closure, summarized in Table 1-1, are further described below [in Sections 1.5.1 to 1.5.3]. (90% RAD, p.8) Further detail on the monitoring approach to achieving the RAOs and NR 726 closure requirements are included in the FSP. The following text was modified: to human health and the environment. Based on pre-remedial modeling predictions, the RAs will leave limited residual contamination consistent with NR 725 and NR 726. Moreover, as summarized below and based on pre-remedial modeling predictions, the residual subsurface soils impacts will not present unacceptable groundwater contaminant risk.

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Comment No.	WDNR Comment per December 23, 2021 Letter	SWL&P Response
18	Section 1.5, page 7, second bullet, second sentence: Compliance with the requirements of Wis. Adm. Code ch. NR140 is required. Remove "and unnecessary" from this sentence. Wis. Adm. Code § NR726.05(6)(b) states "natural attenuation will bring the groundwater into compliance with ch. NR140 groundwater quality standards within a reasonable period of time, considering the criteria in s. NR722.07". In order to comply with this requirement, monitoring data, collected following active remedial action activities, will need to be used to evaluate the timeframe to achieve groundwater standards, prior to the DNR granting closure of this Site. Also, the DNR does not concur that compliance with the PALs/ESs is technically and economically infeasible. Ultimately, compliance with Wis. Adm. Code ch. NR140 may be possible using natural attenuation as a final remedial action which may be technically and economically feasible. This, however, must be shown through adequate long-term monitoring following the active remedial action.	The requested "and unnecessary" text was removed and remaining text modified to: RAO 3: Site Performance Standards[14] (e.g., natural attenuation) are predicted to achieve a stable/receding extent of groundwater impact. **As discussed with WDNR, attaining groundwater PALs/ESs may be technically and economically infeasible at this Site.** The Site use is heavy industrial, the Site is underlain with the low-permeability Miller Creek Clay Formation and the City of Superior receives drinking water from Lake Superior. There are no complete groundwater contaminant exposure pathways. Furthermore, extensive Site investigation data from the last few years demonstrates the groundwater concentrations, area, and mass, for benzene and select PAHs, are receding or stable. Following the soils remediation as part of the RA, operations, maintenance, and monitoring (OM&M) data will determine if the groundwater contamination is shrinking and poses no unreasonable human health or environmental risk considering property use and human health exposure pathways and evaluate the timeframe to achieve groundwater standards, prior to the DNR granting closure of this Site. WDNR concurred during development of the *RAOR* and also during the *RAOR* call/meeting and in the conditional approval letter on January 28, 2021, that groundwater ESs and PALs may not be achieved at this Site utilizing the selected RA, and furthermore directed SWL&P to NR140 regulations that highlight an approach when it is technically and economically not feasible to attain ESs and PALs (NR140.24 and 140.26 Table 6, Response 8). Based on the approved *RAOR*, this alternative groundwater approach in the RD was also included as a potential approach to Site closure. The WDNR does not currently concur that compliance with the PALs/ESs is technically and economically infeasible but suggests compliance with Wis. Adm. Code ch. NR140 may be possible using natural attenuation as a final remedial action which may be technically and economically feasible. Evidence documenting Site conditions and the effectiveness of the selected RA and MNA will be gathered through adequate long-term monitoring following the active remedial action to evaluate Site conditions.
19	Section 1.5, page 7, second bullet, third sentence: Groundwater contaminated at concentrations greater than the Wis. Adm. Code ch. NR140 groundwater quality standards are an impact to the environment. Remove the statement that Site groundwater is not a threat to the environment. It is acceptable to discuss property use and human health exposure pathways. The Miller Creek formation is known to contain sand and gravel seams, particularly in proximity to the Superior harbor of Lake Superior, and may not be as protective as implied here. Adequate monitoring of the remedial action may show protectiveness, but this has not been demonstrated in the work conducted to date. Change this sentence to reflect this.	See response to Comment 18 above. The statement that Site groundwater is not a threat to the environment was removed and replaced with statement on property use and human health exposure pathways. The long-term groundwater monitoring network is illustrated on Drawing A-8 and the program to monitor the remedial action to evaluate protectiveness, including groundwater monitoring well construction and sampling, is provided in the FSP. The text was modified to change the word impermeable to lower-permeability.
20	Section 1.5, page 7, second bullet, fourth sentence: This sentence says that following the active remedial action data "will confirm the groundwater contamination is shrinking and poses no unreasonable human health or environmental risk". The DNR does not concur with this statement. This is not known, nor has it been demonstrated, at this time. Evidence documenting Site conditions will need to be gathered following the active remedial action to evaluate Site conditions. Change this sentence to state monitoring will be conducted to demonstrate the effectiveness of the selected remedial action and natural attenuation.	See response to Comment 18 and 19 above.

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Comment No.	WDNR Comment per December 23, 2021 Letter	SWL&P Response
21	Section 1.5, page 7, second bullet, fifth sentence: The DNR concurred during the development of the RAOR that compliance with the Wis. Adm. Code ch. NR140 ESs and PALs may not be achievable utilizing the selected active remedial action. The use of natural attenuation as a final remedial action may ultimately result in compliance with the ESs and PALs but this will need to be shown through monitoring following active remedial action at this Site. Remove the statement saying the DNR concurred that the ESs and PALs could not be achieved at this Site.	See response to Comment 18 above. The statement about WDNR "concurrence" was removed.
22	Section 1.5, page 7, second bullet, last sentence: The DNR conditionally approved the RAOR on the basis that the DNR would require additional remedial action if the selected remedial action was not effective at remediating the Site to Wis. Adm. Code requirements. Reference the conditional approval letter of January 28, 2021 in this sentence.	See response to Comment 18 above.
23	Section 1.5, page 8, first paragraph: This paragraph appears to say that Foth's Site-Specific target concentration of 5 mg/kg benzene and Foth's Site Specific MNA target concentration of 250 µg/L in groundwater will not be met. The DNR was on the understanding that Foth's target concentration for excavation and MNA would be met during the active remedial action. This needs further explanation. Also, Foth's target concentration of 5 mg/kg is 1000 times higher than the Wis. Adm. Code NR720 Residual Contaminant Level (RCL) for protection of groundwater. Leaving high concentrations of contamination in place following the active remedial action may make natural attenuation ineffective as a final remedial action.	See General Comment #3. The following text was modified for clarification. COCs are above standards. The Site-specific excavation target concentration and the Site-Specific biosparge target concentration[15] will be met during initial RA activities (excavation, ORC amendment, biosparge/SVE) but the Site-Specific MNA Target Concentrations[17] will be addressed through MNA following completion of active RAs. Success of the full-scale remedy will be determined based on achieving the RAOs adopted in the *RAOR* and other applicable requirements.
24	Section 1.5, page 7, second bullet, second sentence: The DNR has not approved the Site-Specific Excavation target concentration as an applicable cleanup level at the Site. The Wis. Adm. Code ch. NR 720 RCLs for direct contact and groundwater will be used to determine compliance for soil remedial actions. Achieving the RAOs established by Foth and SWL&P does not necessarily mean the Site will close under Wis. Adm. Code ch. NR726. See General Comments #1.	See General Comment #1 and #12. The following text was modified. RAO 2: Targeted excavation of soil (*RAOR*, Option 3) for a total of 10,600 cy in-place and biosparge/SVE until an asymptotic condition is met. **As discussed with WDNR during *RAOR* development, and as presented in the approved *RAOR*, excavation results in a significant mass of contaminants removed in the areas of concern (i.e., approximately 95% in the former Hortonsphere and former gas holder areas and approximately 60% in the MGP discharge area)**. In consultation with WDNR, SWL&P selected a combination of RAs for soils to achieve restoration of this Site to the extent technically and economically feasible. Agreement on the extent of the excavations based on the Site-Specific Excavation Target Concentration[13] was guided by the technical and economic feasibility of RA at this Site, given its low risk to human health and the environment. The Site-Specific Excavation target concentration is a short-term action level for excavation and not the NR 720 RCL for direct contact or groundwater protection that will be used to evaluate long-term compliance for residual soil and groundwater at the Site including a range of closure options in NR 726. The Wis. Adm. Code ch. NR 720 RCLs for direct contact and groundwater will be used to determine compliance for soil remedial actions. Based on pre-remedial modeling predictions, the RAs will leave limited residual contamination consistent with NR 725 and NR 726. Moreover, as summarized below residual subsurface soils impacts are not predicted to present unacceptable groundwater contaminant risk.

SWL&P RESPONSE TO DNR COMMENTS ON THE 90% REMEDIAL ACTION DESIGN DELIVERABLES

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Revised: Tuesday, March 29, 2022

Comment No.	WDNR Comment per December 23, 2021 Letter	SWL&P Response
25	Section 1.5.1, page 8, first paragraph, fourth sentence: The DNR allows averaging of soil sample results, with prior approval of a proposed sampling plan and analysis methodology. This approval has not been requested, nor would DNR likely approve averaging for the stated purpose. The individual discrete sample results will be compared to the Wis. Admin. Code ch. NR720 Residual contaminant levels. The DNR **is not** approving the use of averaging of soil contaminant concentrations at this Site for the purpose of compliance with Wis. Adm. Code ch. NR720, comparison of Site conditions to environmental standards as defined in Wis. Adm. Code ch. NR700.03(20), or any other requirement of Wis. Adm. Code chs. NR700-799 or Wis. Adm. Code ch. NR140.	NR 726 Closure options will be fully evaluated during closure. When evaluating the soil concentrations, the individual discrete sample results will be compared to the Wis. Admin. Code ch. NR720 RCLs. Excavated soil from the former MGP gas holder, former Hortonsphere, or former MGP discharge area excavations will not be used as backfill in on-Site excavations.
26	Section 1.5.1, page 8, footnote 12: 250 µg/l benzene in groundwater is not an environmental standard established by the DNR nor has this concentration been approve by the DNR as an acceptable endpoint for the remedial action. The remedial action must comply with the requirements of Wis. Adm. Code chs. NR140 and NR700-NR799. The DNR will evaluate groundwater concentrations against the Wis. Adm. Code NR140 Groundwater Quality Standards.	The site-specific enhanced MNA target concentration is a short-term action level to be achieved after 4 years of enhanced MNA after mixing ORC into the 1-foot soil layer beneath the excavation. Compliance will be evaluated using groundwater monitoring wells located beneath the former MGP gas holder and former Hortonsphere excavation limits. See Response to Comment #2. [19] **Site-Specific Enhanced MNA Target Concentration** – a post excavation target concentration that approaches 1 mg/L benzene remaining in groundwater associated with deep soil (>4 ft bgs) following enhanced MNA over time. This target concentration was determined based on a site conditions and modeled results. This is not an environmental standard established by the WDNR. The long-term remedial action must comply with the requirements of Wis. Adm. Code chs. NR140 and NR700-NR799. The DNR will evaluate groundwater concentrations against the Wis. Adm. Code NR140 Groundwater Quality Standards.
27	Section 1.5.1, page 9, first paragraph: See General Comment #3.	This paragraph has been deleted.
28	Section 1.5.1, page 9, third paragraph: The information and assumptions used in the modeling in Appendix D-1 provide the rationale for developing the 5 mg/kg target concentration. However, the predictive modeling results will need to be verified by actual Site conditions during the monitoring phase after the active remedial action is complete.	Comment noted and text was modified as follows: benzene concentrations in the biosparge/SVE area are anticipated to be negligible. The predictive modeling results provided in Appendix D-1 will be verified by actual Site conditions during the monitoring phase after the active remedial action is complete.
29	Section 1.5.1, page 9, fourth paragraph See General Comment #3.	
30	Section 1.5.1, page 9, fourth paragraph last two sentences: Foth has indicated in Section 1.5, page 8, first paragraph, that the Site-Specific Excavation target concentrations would not be met. Here it states the excavation limits were established based on the target concentrations. This is contradictory language. Edit to clearly state what is being used to establish the limits of the excavations.	See response to Comment 24. The Site-Specific Excavation target concentrations will be met through excavation/removal in the Former Gas Holder and Hortonsphere areas.
31	Section 1.5.2, page 10, second paragraph and footnote: The Site-Specific Biosparge target concentration of 1 mg/kg benzene is not a Wis. Adm. Code ch. NR720 RCL established for the protection of groundwater and it is not an endpoint concentration approved by the DNR.	Comment noted and text was modified as follows: [19] **Site-Specific Biosparge Target Concentration** – a target concentration of 1 mg/kg benzene remaining in deep soil (>4 ft bgs) following excavation and biosparging within the Limits of Active Remediation. This target concentration was determined based on a site conditions and modeled results of the biosparge system performance. The Site-Specific Biosparge target concentration of 1 mg/kg benzene is not a Wis. Adm. Code ch. NR720 RCL established for the protection of groundwater and it is not an endpoint concentration approved by the DNR.

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32	Section 1.5.2, page 10, second paragraph: This paragraph discusses benzene acting as a solvent for the other BTEX and PAH compounds. In the last sentence Foth explains that the "inert tarry material" is acting as a carbon source reducing the benzene concentration in groundwater. Remove "inert" from the term "inert tarry material". These compounds are mainly PAHs and other organic compounds and are not "inert". Additional detail is necessary explaining this relationship and its effect on remediation and estimated remediation timeframes.	Comment noted and text was modified as follows: **and PAHs near 95%.** At an average TOC of 4%, biosparging would result in residual groundwater concentrations near 0.25 milligrams per liter (mg/L) in 4 years. As described in Appendix D-1, the TOC, associated with tarry material and woody material (0.15%), would result in reduced groundwater concentrations (compared to low TOC soil) by about a factor of 4 modeled at leaving residual groundwater concentrations near 0.06 mg/L in 4 years.
33	Section 1.5.2, page 10, third paragraph, third sentence: Add text indicating the DNR will make decisions at this Site by evaluating the analytical results against the Wis. Adm. Code ch. NR720 residual contaminant levels for the both the direct contact pathway as well as the groundwater pathway.	Text has been added as requested, with additional reference to the NR726 closure options. of these variables. WDNR will make final closure decisions at this Site by evaluating the analytical results against the Wis. Adm. Code ch. NR720 residual contaminant levels for the both the direct contact pathway and the groundwater pathway, but closure decisions will be based on all allowable NR726 closure options.
34	Section 1.5.2, page 10, third paragraph, last sentence: When referencing the modeling done in Appendix D-1 and the methodology used to derive the Site Specific Biosparge target concentration, it would be helpful to provide additional discussion in this section. Instead of simply listing the variables used, provide information on how they impact the remedial timeframe, and a summary of the analysis done to determine remedial timeframe and establish the remedial target. See General Comment #6.	See response to General Comment #6.
35	Section 1.7, page 11 first paragraph, last sentence: See General Comment #1.	We assume the reference is to Section 1.6.4, page 13. A focus on achieving the three key RAOs does not preclude consideration of environmental standards as part of the Site closure process. See response to General Comment #1.
36	Section 1.7, page 14, third paragraph: Residual soil contamination causing exceedances of Wis. Adm. Code ch. NR140 groundwater quality exceedances is a completed pathway and an ongoing threat to the environment. Also, due to the significant contamination in the slip it is unknown at this time what, if any, concern there is for ecological or human receptors for the remaining contamination. Further evaluation is needed following active remedial action while assessing natural attenuation as a final remedial action.	See response to General Comment #5. The FSP and OM&M Plan provides a plan for post-remedial action monitoring and evaluation.
37	Section 1.7, page 14, fourth paragraph, third sentence: The DNR required establishing Continuing Obligations (COs) as part of the remedial action design in the RAOR conditional approval letter dated January 28, 2021. The DNR does not intend to approve a final design without these COs established and a GIS package submitted to the DNR. See "Continuing Obligations" near the end of this letter. Also, continuing obligations remain in effect on a property until it can be shown that the remaining contamination, in any affected media, is below environmental standards established by the DNR (e.g. Wis. Adm. Code ch. NR720 RCLS for soil and NR140 groundwater quality standards for groundwater).	See response to "Continuing Obligations" at end of letter. The CO's will be revised and resubmitted and the GIS package will also be submitted to the DNR with the 100% RD.
38	Section 2.1.5, page 19, first paragraph: The DNR requested additional groundwater monitoring wells and piezometers be installed to provide further information on groundwater quality during and following active remedial action activities. The DNR requested piezometers, nested with monitoring wells MW-3R and MW-4R, monitoring wells directly downgradient of the Hortonsphere and gas holder excavations and an additional monitoring well located near the City of Superior building in the area of SLIF-33.	The additional groundwater monitoring wells will be installed as requested. See Drawing A-8 for the locations of the two new monitoring wells and one relocated well.

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	This RAD does not include the requested piezometers. The DNR will not approve a final design without all the requested monitoring wells included in the RAD. DNR wants the replacement monitoring wells MW-3R and MW-4R installed as water table observation wells screened within the excavation backfill only and piezometers installed with 5-foot well screens installed at approximately 596 to 601ft MSL and adjusted to intersect any sand and gravel seams encountered near this depth. The screen and filter pack for the piezometers is not to extend into the excavation and an adequate seal placed so groundwater from the backfilled excavation does not migrate through the filer pack or well casing into the piezometer. Also, Foth depicts the location of an additional monitoring well MW-29, further east than the DNR would prefer. The DNR wants a well installed near the location of SLIF-33 to be nearer the active remedial action area to be able to assess groundwater quality near the active remedial action system. Install the well screen to intersect the depths of elevated LIF values.	Drawings B-5 and B-6 for illustration of the relative depths of the two monitoring well nests in the former MGP gas holder and former Hortonsphere excavations. The location of MW-29 has been modified on Drawing A-8 as requested.
39	Section 2.2.1.1, page 21, first paragraph, third sentence: See General Comment #7.	See General Comment #7.
40	Section 2.2.1.1, page 22, first paragraph, last sentence: See General Comment #3.	See response to Comment #3 above.
41	Section 2.2.1.2, page 22, first paragraph, first bullet: "Soil" does not describe the contamination present. See General Comment #7.	See General Comment #7.
42	Section 2.3, page 23: Section 2.3 should specify that the vented soil pile construction will comply with the requirements of Wis. Adm. Code NR718. Also, although the liquid drainage sump location is identified in Drawing B-8, the drainage sump design is not illustrated as indicated in the narrative.	Text has been updated as requested: Soil with concentrations of benzene greater than 10 mg/kg will be treated in vented soil piles. The location of the vented soil piles is shown on Drawing B-1. The vented soil pile construction will comply with the requirements of Wis. Adm. Code NR718. The vented soil pile containment is shown on Drawing B-8 and the liquid drainage sump design is shown on Drawing B-11. This comment is not clear. The data appear correct.
43	Section 2.6.1, page 26, second bullet: The 5 mg/kg Site-Specific Excavation target concentration is not a concentration developed under Wis. Adm. Code NR720 and it is not a Residual Contaminant Level approved by the DNR. See General Comment #2.	See response to General Comment #2 and 24 above. No revision to the referenced text was made based on providing a clarification to the Site-Specific Excavation Concentration in Section 1.5.
44	Section 2.6.1, page 26 second paragraph, third sentence: See general Comment #3.	See General Comment #3. chemical impacts for verification sampling. Excavated soil containing benzene near 10 mg/kg, a landfill acceptance limit, will be stockpiled for further characterization. If the soil stockpile sample results meet the landfill acceptance limits, as detailed in Table 2-3 of the *FSP,* it will be
45	Section 2.6.1, page 27, second paragraph, first sentence: The "standards" established in the Field Sampling plan were not developed using Wis. Adm. Code ch NR720 and therefore are not considered RCLs protective of groundwater quality.	See response to Comment #2.

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46	Section 2.6.2, page 27, second paragraph, second sentence: See General Comment #3.	The FSP will be updated consistent with revisions to the RAD. To the extent possible, excavated soil will be loaded directly in haul vehicles and transported directly to the off-site landfill for disposal or directly to the vented pile for further treatment. Some soil with benzene near 10 mg/kg, a landfill acceptance limit, will be stockpiled at the Material Management Pad for further characterization. Based on rapid field screening results during excavation for benzene using a field GC such as a FROG 5000, excavated soil near 10 mg/kg, a landfill acceptance limit, will be stockpiled in one or more segregated stockpiles based on excavation location and visual chemical impacts for verification sampling and off-site laboratory analysis. If the soil stockpile sample results meet the landfill acceptance limits, as
47	Section 2.10, page 33, second paragraph, second sentence: See General Comment #3.	See General Comment #3. The reference to using excavated soil as backfill has been deleted.
48	Section 2.11, page 35, second paragraph: The description of the systems in this paragraph is unclear in part due to the terminology used and the lack of or incorrect references to drawings. For example, Drawing F-2 does not appear to be the correct reference for the SVE system elements described. Does the system have 16 or 17 horizontal wells? Are the terms bioventing well and biosparging well being used interchangeably? Please revise the paragraph to clearly and concisely describe the individual system components and design parameters.	There are 17 horizontal SVE wells. These 17 horizontal SVE wells are parallel to 17 rows of vertical biosparge wells. (Reference to 16 horizontal SVE wells was revised to 17 in Section 4.3.3.) Drawing F-1 provides a layout for the biosparge and SVE systems within a single 2-room enclosure. No bioventing wells are part of the RAD, references to bioventing wells has been changed to biosparging well or SVE well for clarity. Reference to Drawing F-2 was revised to F-1. P&ID drawings showing the referenced biosparge and SVE equipment are shown on Drawings F-5 and F-6. (Some of the system details will change based on manufacturer proprietary construction while maintaining conformance with the RAD design criteria and specifications).
49	Section 2.12, page 36: This section describes the "potential" use of chemical oxidants as a backfill amendment. The DNR understands that the use of chemical oxidants is planned for backfill placed beneath the water table. Change this section to state how chemical oxidants are to be used.	Chemical oxidants (solid ORC and liquid hydrogen peroxide) will be used for amendment of backfill soils and suppression of VOC vapors during excavation, respectively. Added to end of paragraph: "However, other emission suppressants such as Rusmar foam or water may be more appropriate during excavation and stockpiling, depending on the level of VOC vapor emissions present."
50	Section 2.14, first paragraph: See General Comment #5.	See response to General Comment #5 No change to text was made since no specific revision to this section has been requested and the response to Comment #5 cites the proposed monitoring program.
51	Section 3.1.1, page 37, second sentence: See General Comment #3.	Text has been revised as follows: Impacted soil containing benzene less than the landfill acceptance limit of 10 mg/kg, and impacted soil greater than the landfill acceptance limit of 10 mg/kg benzene will be generated during excavation. Waste management of these materials are further described in Section 2.2.1. Impacted soil less than the landfill acceptance limits will be loaded directly into haul vehicles and transported to an off-site Subtitle D (non-hazardous material) landfill. Soil near the landfill acceptance limit of 10 mg/kg benzene would be temporarily stockpiled to allow characterization sampling and analysis and then loaded in haul vehicles and transported to an off-site Subtitle D (non-hazardous material) landfill (if benzene is < 10 mg/kg) or transported to the vented pile for further treatment (if benzene is >10 mg/kg). Excavated soils above 10 mg/kg benzene will be

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52	Section 3.1.3, page 38: Air emission standards are not included in Wis. Admin. Code NR 700. Please use the correct code reference.	The correct reference to air emission standards is provided in the AMP and is Wis. Admin. Code NR 445. List of standards is provided in AMP, Table 3-1. treatment. If air stripping is used as a wastewater treatment process and air emissions levels are above acceptable Wis. Admin. Code NR 445 standards shown in Table 3-1 of the *AMP*, associated air emissions would be treated using GAC.
53	Section 4.1.3 page 45, second paragraph, third sentence: See General Comment #1.	See response to General Comments #1, #18, and #19 above. The revisions to Section 1.5 clarify how achievement of RAO 3 will be evaluated.
54	Section 4.2.1, page 46: Drawing references are incorrect. Wastewater treatment system component labels are inconsistent with narrative. Correct this section.	Reference to Drawings D-3 and D-4 were switched when the drawings were re-numbered and the text was not revised. This revision has been made to the text.
55	Section 4.3.3 page 50, second paragraph: See comments on Section 1.5.2, page 10, second paragraph and footnote and Section 1.5, page 10, third paragraph, last sentence.	Site-Specific Biosparge Target Concentration and RAOs have not been met, and if no other contingency actions to achieve the residual soil and groundwater RAOs are feasible, the area under the gravel piles will represent a structural impediment relative to continuing obligations.
56	Section 4.3.3 page 50: Please describe the placement and construction of horizontal wells used for soil vapor extraction including: • Range of depths from ground surface and the potential for short circuiting, • Well screen/perforation density and distribution, • Potential for freezing condensate in pipes during winter	As shown on Drawing E-10, the base of the horizontal SVE wells is 45 inches below ground surface. As shown on Drawing A-13 water levels are 4 ft to 10 ft below ground surface in the biosparging area ignoring the gravel piles. Compaction of native fill and placement of low-permeability clay/silty clay in the backfilled trenches is expected to reduce short-circuiting. SVE system testing was completed as shown in Appendix D-2 such that the design could be completed to minimize short-circuiting by managing the distance between SVE wells and biosparge wells. Lastly, short-circuiting will be evaluated during biosparge/SVE system performance testing which includes measurement of the unsaturated soil vacuum distribution and air flow rates. Further optimization of air injection and air extraction rates can be made to address location-specific variability as described in the OM&M Plan. This information will be provided by the construction contractor as the procurement process proceeds and will be included with the construction submittals. Freezing condensation in pipes during winter is a particular concern for exposed air injection or SVE piping. Some heat tracing of piping to the vented piles has been included and additional heat tracing will be included, as needed, based upon the Contractor's submittal for the biosparge/SVE systems and associated piping. To minimize risks of freezing, the biosparge/SVE system will not run between November 15 and April 15, unless freezing weather is not anticipated. No additional winterization is needed. This will not change the biosparge/SVE performance estimates.

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57	Section 7, page 59, first paragraph: Wis. Adm. Code § NR712.07(2) requires that submittals prepared to satisfy the requirements of Wis. Adm. Code ch. NR724 be jointly prepared by or under the supervision of both and professonial engineer and a hydrogeologist. Submittal certification requirements are contained in Wis. Adm. Code ch. NR712.09.	Heather Hallett is a Foth Professional Geologist that is assisting with preparation and supervision of the RAD. She and Brian Symons, P.E., certified the 90% RAD submittal. Design documents will be certified by a Professional Engineer and a Professional Geologist licensed in the state of Wisconsin. The design either will consist of specified methods, materials, and sequences or will be performance-based for some activities as identified in the design, with Foth responsible for the performance of the design.
58	Table 1-1, left column, Shallow Soil Excavation, Evaluate Soil Data: See General Comment #3.	See General Comment #3.
59	Table 1-1, left column, Deep Soil Excavation, Evaluate Soil Data: See General Comment #3.	See General Comment #3.
60	Table 1-1, Center Column, Evaluate SVE Recovered Air Data: Explain in text and reference in table how it was determined that a one-week shutdown of the system is sufficient for determination of rebound.	"The one-week shutdown period to assess rebound of COCs in air was selected based on the volatility of the BTEX and experience monitoring rebound during SVE shut-down at other sites. If the initial monitoring suggest sufficient time has not been allowed to assess rebound, the rebound monitoring period will be extended appropriately."
61	Table 1-1, Center Column, Evaluate Soil Data: See comment for Section 1.5.1, page 8, first paragraph, fourth sentence. The DNR will not utilize averaged sample results for Wis. Adm. Code chs. NR700-799 compliance decisions.	See comments Section 1.5.1.
62	Table 1-1, Right Column, Monitored Natural Attenuation, Monitor Long Term Groundwater Network: The DNR will not use groundwater samples collected during the operation of the air sparge/SVE system for natural attenuation evaluation. Change text to make it clear that natural attenuation monitoring will begin following shutdown of the air spare/SVE system.	Natural attenuation monitoring will begin in and downgradient of the Biosparge Area following shutdown of the air sparge/SVE system. Natural attenuation monitoring will begin at the former MGP gas holder and former Hortonsphere areas following excavation and backfill of those areas.
63	Table 1-1, Right Column, Evaluate Groundwater Data, Evaluate Groundwater Data Results: The DNR considers an increasing contaminant concentration in a well to be indicative of an unstable or increasing groundwater contaminant plume and depending on the specific circumstances the DNR may require additional remediation, continued monitoring, or additional investigation. If this situation arises the DNR may not concur that RAO #3 is achieved. Edit Table 1-1 to reflect this.	An increasing contaminant concentration in a well may indicate fluctuating groundwater levels that may not represent an increase in overall plume size, mass, or even mass flux. Multiple lines of evidence (as noted for evaluating achievement of RAO 3) are needed to fully assess the long-term trends and overall significance of an increase in contaminant concentration at a single well. Thus, it is inappropriate to assess overall plume stability based solely on a potential increase in contaminant concentration at a single well. The plume stability evaluation includes multiple lines of evidence.
64	Figure A-7, Typical Temporary Fence Detail: According to Wis. Adm. Code § NR714.07(4), Department issued signs are required to be posted at various locations at the Site as required in Wis. Adm. Code § NR 714.07(4)(a) and contain the information required in Wis. Adm. Code § NR714.07(4)(b). Per Wis. Adm. Code ch. NR714.07(4)(c) the DNR is requiring signs at the locations specified in Wis. Adm. Code § NR714.07(4)(a) 1.-4. and at 100-foot intervals along construction fences.	The required signage has been added to Figure A-7.
65	Figure C-2, Typical Railroad Section: This figure mentions the railroad bed being “impermeable”. It is highly unlikely the railroad bed, which was originally built on pilings in open water and later filled in is “impermeable”. The DNR has investigated this railroad bed for another investigation near this Site and found crushed rock fill beneath the tracks. It appears the assumption the railroad bed is “impermeable” was used in other construction calculations. This should be corrected unless it is known the railroad bed is in fact “impermeable”.	Foth has assumed in its groundwater flow and pumping modeling that the railbed is a leaky barrier that has some permeability. The text referring to impermeable soil beneath the railbed will be removed.

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66	Appendix B-1, General Comments: Label all tables and figures with a distinct number and title for easy reference.	See response to Comment #6. To aid in referencing information in Section 1.5.2 to Appendix D-2, all tables and figures in the appendices have been numbered, labeled, and given a page unique page number.
67	Appendix B-1, PDF page 144, Average Soil Concentrations: Provide an explanation for the City of Superior area not being included in the Average Soil Concentrations. Add explanation for the highlighting or bold figures in the table. See comment for Section 1.5.1, page 8, first paragraph, fourth sentence for comment on the use of averaging.	Additional statistical analysis was performed to demonstrate that the average soil concentrations on the City of Superior are insignificant.
68	Appendix B-1 PDF page 144, Average Soil Concentrations Tables: Section 1.1 explains that the geometric mean is used to characterize the average soil concentrations for shallow and deep soil. Please explain why the geometric mean is used to characterize average soil concentration rather than the arithmetic mean or the 95% upper confidence limit (UCL) of the arithmetic mean. The use of a geometric mean could lead to underestimating the average soil concentrations. The use of a 95% UCL of the arithmetic mean, assuming there is sufficient data to calculate one, may produce more reliable values for Site averages. In instances where not enough data exist to calculate a reliable mean, the maximum concentration should be used. In addition, when conducting averaging of soil results, please provide a table of the data used in each calculation, and summarize the data along with other statistical measure such as mean, median, max, 95%ile, 95% UCL, and any other useful measures used to describe the dataset. Also describe how non-detects are handled in any calculations. For example, when using the benzene concentration data summarized in the "Summary of Shallow Soil Analytical Results" included in Appendix B, the soil concentrations for locations outside of the 'Former Hortonsphere' excavation area generate a maximum concentration of 114 µg/kg, 95%ile of 85 µg/kg, and a 95% UCL of 50 µg/kg. It is apparent that the 15 µg/kg listed in the "Average Soil Concentrations" Table in Appendix B-1 is an underestimate of what is likely the average soil concentration for this area. Similarly, for the shallow soil benzene concentrations inside the excavation area for the 'Former Hortonsphere', the maximum concentration is 366,000 µg/kg, 95%ile of 315,600 µg/kg, and a 95% UCL of 275,623 µg/kg. Again, the geometric mean calculated for this area (79,982 µg/kg) is likely underestimating the average concentration within the excavation area. Although the 'Former Hortonsphere' shallow soil concentration data is the only portion of the Site which the Department checked to evaluate the effect of utilizing different methods of calculating the mean to characterize Site soils, it is likely that the average calculations for all the Site sub-areas are underestimates of average soil concentrations if the geometric mean was utilized to characterize average soil concentrations. If these geometric means are used to determine compliance for soil cleanup, to calculate treatment rates, or to calculate degradation rates, the resulting calculations will likely underestimate contaminant concentration and mass and also result in an underestimate of time to achieve cleanup criteria and ultimately Site closure.	Additional statistical analysis was performed and will be provided in Appendix B-1. Average values will be used except for the Biosparge/SVE area where highly variable data better support use of a geometric mean.
69	Appendix B-1, PDF page 153, Summary of Shallow Soil Analytical Results and Summary of Deep Soil Analytical Results: 1. Bold font is used to highlight NR 720 Industrial Direct Contact exceedances in the "Shallow Soil" tables; there are instances where some values in bold are not exceedances, and some instances where exceedances are not in bold. Please revise and correct these errors.	Revisions to Appendix B-1 will be completed.

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	2. Bold font is used to highlight NR 720 Groundwater pathway exceedances in the "Deep Soil" tables; there are instances where some values in bold are not exceedances, and some instances where exceedances are not in bold. Please revise and correct these errors.	Revisions to Appendix B-1 will be completed.
	3. Tables should also use italics or other means to distinguish NR 720 groundwater pathway exceedances.	Revisions to Appendix B-1 will be completed.
	4. When listing non-detect values in the tables, the associated detection limit should be used, not 'ND'.	The detection limits will be noted for ND results if they are readily available.
	5. Explain why some samples are listed as "Missing on Map" – are they truly samples where the location is unknown, or are they simply not depicted on the figure included in Appendix B-1? Explain how or if these sample concentrations are used in the averages calculated for each sub-area.	Revisions to Appendix B-1 will be completed.
70	Appendix B-1, PDF page 196, Summary of 2017 and 2020 Groundwater Analytical Results: The table does not have a key to indicate why bold and italic text is used to highlight certain results. Presumably it is used to highlight exceedance of the Wis. Adm. Code ch. NR 140 PALs and ESs, but if so, there are many errors. Please revise and correct.	Revisions to Appendix B-1 will be completed.
71	Appendix B-2, Material Management Flow Diagram: This diagram appears to show ORC being mixed with the 'Non-Impacted' soil. The text of the RAD does not state this is planned. If excavated contaminated soil is treated with ORC it will have to be shown through analysis that contaminant concentrations are below the Wis. Adm. Code ch. NR720 RCLs for the protection of groundwater and meet the other requirements of Wis. Adm. Code ch. NR718 prior to returning the soil to the excavation. See General Comment #3.	ORC will only be mixed with clean, low-permeability off-site borrow material. Use of any on-site excavated material, however low in COC concentrations, as backfill will not be permitted as noted in response to Comment #3.
72	Appendix B-2, PDF page 211, Former MGP Gas Holder Excavation: This sheet appears to say that of the 3,695 cubic yards of excavation volume, 134.3 cubic yards is 'impacted'. The Gas Holder Soil Ratios indicate that 85% of the soil is 'impacted'. 134.3 cubic yards is not 85% of 3,695 cubic yards. This is an example of where information in the appendices is not explained or presented clearly. Information on this sheet and subsequent sheets needs explanation and clarification.	See response to Comment #3. Appendix B-2 will be revised accordingly to quantify: • Impacted Soil <10 mg/kg benzene, a landfill acceptance limit for direct off-site disposal • Impacted Soil for Vented Pile Treatment (> 10 mg/kg benzene)
73	Appendix B-2, PDF page 216, Biosparging Performance Summary" Tables: 1. No units are given for the columns containing chemical concentrations. Edit all tables to show units. 2. One of the tables lists the average overburden concentrations. Define how these average values were derived. Values of 16,000 for benzene (no units given). Assuming the units are µg/kg, these average overburden concentrations exceed both the Wis. Adm Code ch. NR720 groundwater pathway and direct contact RCLs. Why is this material called overburden? Please define how the term 'overburden' is used here and in the rest of the RAD. See General Comment #7.	All tables will be edited to show units. Also see response to Comment #6. See response to General Comment #7. Revisions to Appendix B-2 are in process.
74	Appendix B-3, Table B.2 Vented Pile 3 & 4: 1. This table includes parameters in both metric and imperial units. Please clearly label all columns with the appropriate units.	Recalculated Vented pile volume based on location change and we have space for 4,960 cy approximately. This does not account for piping network within the piles. From the MGP Discharge alone we have a volume of 4,000 cy estimated to be >10 mg/kg Benzene. Each vented pile bin will hold 1,240 cubic yards, See B-5. Units are provided based on performance model input and output data units. The values for Kd, Koc, Ko, and Kh will be added to Table B.2.

SWL&P RESPONSE TO DNR COMMENTS ON THE 90% REMEDIAL ACTION DESIGN DELIVERABLES

SWL&P Former MGP Site, Superior, Wisconsin

Revised: Tuesday, March 29, 2022

Comment No.	WDNR Comment per December 23, 2021 Letter	SWL&P Response
	2. Soil pH affects soil K_{oc}. Was the potential impact of significant cement plant fines from the cement plant activity or the 'lime like material' encountered during the site investigation assessed? 3. '% Removed' columns – why don't the percentages listed in the column sum to 100%, or in some cases exceed 100%?	Soil pH affects solubility of metals and other anionic/cationic chemicals, but not BTEX and PAHs. Soil pH can effect the biodegradability of BTEX and PAHs, but this does not appear to be significant based on the biotreatability results including microbial populations presented in the RAOR. A footnote will be added to Table B.2. "The column percentages are not additive down the column since the removal percentages are chemical specific. The yellow highlighted column is the % removed by bioventing including the mechanisms of degradation and volatilization. The percentage remaining after bioventing is not shown, so the columns for each COC do not add to 100%. That percentage of mass remaining is 100 - % removed by venting."
75	Appendix D-1, Summary of Calculations for Biosparge and MNA Performance, Methodology and Approach: MNA must show that natural attenuation will achieve compliance with the Wis. Adm. Code ch. NR140 Groundwater Quality Standards in a reasonable period of time not the "Site-specific biosparge and MNA target concentration" endpoint selected by SWL&P and Foth (Wis. Adm. Code § NR726.05(6)6.(b). Include calculations to indicate the estimated time necessary to achieve Wis. Adm. Code ch. NR140 Groundwater Quality Standards.	Calculations to indicate the estimated time necessary to achieve Wis. Adm. Code ch. NR140 Groundwater Quality Standards were provided in the first draft of the RAD, but were revised at the request of WDNR due to skepticism in the estimated time to achieve the NR140 groundwater quality standards. Updated calculations will be presented in Appendix D-1 and summarized in Table 2-1 as predicted Site-Specific MNA Target Concentrations.
76	Appendix D-1, PDF page 344, Table 1-1 Total Estimated Mass on Site (Benzene >5 mg/L): This table is not referenced in the text of this section and it is not clear how it supports the methodology and analysis in this section. It is also labeled "Benzene > 5 mg/L". it is unclear if this table is discussing mass of contaminants in soil or water or both. It may be this concentration is supposed to be 5 mg/kg? Please correct this or explain the purpose of this table in the text of this section. Not accounting for mass of contaminants with concentrations from the Wis. Adm. Code ch. NR720 groundwater pathway RCL and the Site specific 5 mg/L (5 mg/kg?) will underestimate the quantity of contaminants present and the Site and result in modeled natural attenuation predictions concluding the Site will achieve cleanup levels more rapidly. Provide a calculation of the total estimated mass including all contaminant mass greater than the Wis. Adm. Code ch NR720 groundwater pathway RCLs or the Wis. Adm. Code ch. NR140 Groundwater quality standards for comparison to the calculations provided in this section.	Calculation of the total estimated mass including all contaminant mass greater than the Wis. Adm. Code ch NR720 groundwater pathway RCLs or the Wis. Adm. Code ch. NR140 Groundwater quality standards was provided in the RAOR, Appendix A.1 for comparison to the calculations provided in this section. [A comparison of the mass balance from the RAOR to the mass balance in Tale 1-1 is provided in response to Comment #68.]
77	Appendix D-1, PDF page 357, Section 5, Calculation of Mass Flux Rate: It is not clear how the mass flux area was measured. Referencing the cross sections without an explanation and justification for the values chosen is not adequate. Provide the sample results and other observations used to support this calculation. It appears the 100-foot length would only cover the contamination in the Hortonsphere area, not both the Hortonsphere and gas holder area.	The referenced scenarios is based on a typical 100-ft unit cross section and is not intended to represent a site-wide cross-section. This was considered an acceptable cross section segment and control volume to evaluate the effects of conductivity, total organic carbon, and benzene concentrations in soil relative to benzene mobility. See response to Comment #68 for an evaluation of benzene concentrations in soil at the former MGP gas holder and former Hortonsphere areas. Measured or estimated aquifer conductivity values are provided in Appendix C-1. TOC concentrations in soil are presented in Appendix D-1, Attachment 5 - Site-Specific Partition Coefficients.
78	Appendix D-1, Section 7, PDF page 361, Biosparge and MNA Effectiveness and Time Frame, second bullet: The ORC in the deep fill material may help remediate benzene and other contaminants leaching from the remaining soil contamination but due to the low permeability of the clay soil it is suspected the ORC will not remediate remaining contamination beneath and outside of the area of excavation. Groundwater monitoring will provide information on the effectiveness of the ORC.	See response to Comment #5. Additional ORC material will be blended into the top 1-foot of soil beneath the excavation limits to enhance biodegradation of residual COCs in residual soil. Groundwater monitoring will provide information on the effectiveness of the ORC.

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79	Appendix D-2, page 449: SVE pilot testing concluded that the actual ROI for a vertical well was 15 feet as opposed to the theoretical 30 feet. With implementation of an engineered low-permeability surface cover, the ROI is anticipated to expand to approximately 20 feet. Discuss whether these conclusions hold true for a shallow horizontal well and if so, provide specifications for the engineered low-permeability cover that will provide the additional ROI and prevent short circuiting.	See response to Comment #50. A specification for engineered permeable cover will be included in Section 31 05 10.
80	Appendix E, PDF page 660, Specifications, Section 02 61 13, Part 2 Products, 2.1 Barrier Fence: This section should include appropriate warning signs required in Wis. Adm. Code ch. NR714.07(4). See comment on Figure A-7.	The following has been added to Section 02 61 13/2.1 C: According to Wis. Adm. Code § NR714.07(4), Department issued signs are required to be posted at various locations at the Site as required in Wis. Adm. Code § NR 714.07(4)(a) and contain the information required in Wis. Adm. Code § NR714.07(4)(b). Per Wis. Adm. Code ch. NR714.07(4)(c) the DNR is requiring signs at the locations specified in Wis. Adm. Code § NR714.07(4)(a) 1.-4. and at 100-foot intervals along construction fences."
81	Attachment 3 Calculations, PDF page 820, Aqtesolv Summary Output: See comment for Figure C-2, Typical Railroad Section.	See response to comment for Figure C-2, Typical Railroad Section.
82	Attachment 3 Calculations, PDF page 821, Aquifer Parameter Summary Table: Hydraulic conductivity measurements were not conducted at the MW-3 and MW-4 location. The DNR expects hydraulic conductivity testing will be conducted at the location of MW-3R, MW-4R and the piezometers installed with MW-3R and MW-4R for natural attenuation evaluation.	Hydraulic conductivity testing will be conducted at the location of MW-3R, MW-4R and the piezometers installed with MW-3R and MW-4R for natural attenuation evaluation. This testing will be reflected in the *FSP* .
	Construction Quality Assurance Plan	
83	Construction Quality Assurance Plan, PDF page 859, Table 4-1, Groundwater well abandonment: Construction Acceptance Criteria for the groundwater well abandonment includes both Wis. Adm. Code § NR 812.26 and Wis. Adm. Code § NR141.25. All reference to Wis. Adm. Code in this table should be labeled as Wis. Adm. Code. Table 4-1, Construction Acceptance Criteria for Vented soil pile construction should include Wis. Adm. Code ch. NR718. Table 4-1, Construction Acceptance Criteria for Excavation material confirmation sampling should not label that soil < industrial shallow soil RCL is non-impacted material. The DNR considers this material contaminated as that term is defined in Wis. Adm. Code NR700.03(7). See General Comment #7. Table 4-1 Construction Acceptance Criteria for Backfill of non-impacted material and clean fill: The DNR is not granting an exemption to the location standards contained in Wis. Adm. Code ch. NR718.12(1)(c). Therefore, soil contaminated at concentrations greater than the Wis. Adm. Code ch. NR720 RCLs for the protection of groundwater is not to be returned to the excavation. See General Comment #3.	Construction Acceptance Criteria for the groundwater well abandonment includes both Wis. Adm. Code § NR 812.26 and Wis. Adm. Code § NR141.25. All reference to Wis. Adm. Code in this table will be labeled as Wis. Adm. Code. Table 4-1, Construction Acceptance Criteria for Vented soil pile construction will include Wis. Adm. Code ch. NR718. See response to General Comment #7. See response to General Comment #3. Excavated soil from the former MGP gas holder, former Hortonsphere, or former MGP discharge area excavations will not be used as backfill in on-Site excavations.
84	Construction Quality Assurance Plan, PDF page 862, Section 5.1: Daily inspection reports should also contain records of any public complaints received and follow-up taken to correct the situation.	Daily inspection reports will also contain records of any public complaints received and follow-up taken to correct the situation.
85	Construction Quality Assurance Plan, PDF page 862, Section 5.3: The DNR will not review this Site for closure until it can be shown that the requirements of case closure contained in Wis. Adm. Code ch. NR726.05 are met. Adequate post-construction and post-operation monitoring will be necessary to document compliance with Wis. Adm. Code. See General Comment #1.	See General Comment #1.

SWL&P RESPONSE TO DNR COMMENTS ON THE 90% REMEDIAL ACTION DESIGN DELIVERABLES

SWL&P Former MGP Site, Superior, Wisconsin

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Comment No.	WDNR Comment per December 23, 2021 Letter	SWL&P Response
	Remedial Action Operations, Maintenance, and Monitoring Plan	
86	Section 1.1 and 1.2, PDF page 883-886, Overview and Purpose: See General Comment #1-8 and specific comments above.	See General Comment #1-8.
87	Section 2.4, PDF page 892, first paragraph, second to last sentence: See comment: Table 1-1, Center Column, Evaluate SVE Recovered Air Data above.	Table 1-1 will be revised as noted above for the same table included in the RAD.
88	Table 1-1, PDF page 927, Performance Monitoring to Achieve Remedial Action Objectives: See comments: Table 1-1, Left Column, Shallow Soil Excavation, Evaluate Soil Data above. Table 1-1, Left Column, Deep Soil Excavation, Evaluate Soil Data above. Table 1-1, Center Column, Evaluate SVE Recovered Air Data above. Table 1-1, Center Column, Evaluate Soil Data above. Table 1-1, Right Column, Monitored Natural Attenuation, Monitor Long Term Groundwater Network above. Table 1-1, Right Column, Evaluate Groundwater Data, Evaluate Groundwater Data Results above.	 Table 1-1 will be revised as noted above for the same table included in the RAD. Table 1-1 will be revised as noted above for the same table included in the RAD. Table 1-1 will be revised as noted above for the same table included in the RAD. Table 1-1 will be revised as noted above for the same table included in the RAD. Table 1-1 will be revised as noted above for the same table included in the RAD. Table 1-1 will be revised as noted above for the same table included in the RAD.
	Erosion Control and Storm Water Management Plan	
89	The DNR RR Program will rely on the DNR's Wastewater Program and the City of Superior to comment and provide permit approval for the Erosion Control and Storm Water Management Plan.	SWL&P is working with WDNR's Wastewater Program and the City of Superior to finalize the Erosion Control and Stormwater Management Plan. The stormwater issue might need regulatory and/or legal review if the property owners do not agree to it.
	Field Sampling Plan	
90	Section 2, PDF page 1223-1224, Objectives: See General Comment #1-8 and specific comments above.	See response to General Comments #1-8.
91	Section 2.2, PDF page 1224, Monitoring Approach, first sentence: The RAOR developed target concentrations for the remedial action which are not consistent with the term Environmental Standards in Wis. Adm. Code § NR700.03 (20) referenced in the footnote on page 2 of the Field Sampling Plan. The exception to this is removing soil with direct contact exceedances of the Wis. Adm. Code ch. NR720 industrial RCLs. Clarify this sentence.	See response to Comment #2.
92	Section 2.3, PDF page 1225, Monitored Natural Attenuation: See General Comment #5.	See response to General Comment #5.
93	Section 4.3, PDF page 1231, Soil Excavation Confirmation: The DNR is not approving using soil with contamination above the Wis. Adm. Code ch. NR720 groundwater RCLs to be placed back into the excavation. See General Comment #3. Also, a clear definition of the term 'overburden' is not included in any of the reports reviewed for this letter. See General Comment #7. Section 4.3 requires modification.	See response to General Comment #3. Excavated soil from the former MGP gas holder, former Hortonsphere, or former MGP discharge area excavations will not be used as backfill in on-Site excavations. See General Comment #7. The term "overburden" is no longer used in the RAD documents.
94	Section 4.4, PDF page 1232, Backfill Confirmation: See General Comment #3. Section 4.4 requires modification.	See response to General Comment #3.
95	Section 4.8.1, PDF page 1235, Well Network: See comment Section 2.1.5, page 19, first paragraph above.	See response to comment Section 2.1.5, page 19, first paragraph. The groundwater monitoring well network will be revised to include two additional wells and relocating MW-29.
96	Section 4.9.1 PDF page 1237, Perimeter Air Monitoring, first paragraph: This paragraph mentions the COCs being measured include particulate matter, naphthalene and benzene whereas the Air Management Plan appears to include all BTEX compounds being monitored. This discrepancy needs clarification or correction.	The air management plan provides the correct COCs to be measured and the FSP will be updated accordingly.
97	Section 4.10, PDF Page 1238, Biosparge/ SVE Monitoring: See General Comment #2.	See response to General Comment #2.
98	Section 7, PDF Page 1251, Methods for Evaluating Compliance with RAOs: Modify this section to include comparison of results to the Wis. Adm. Code ch. NR720 Residual Contaminant Levels for the protection of groundwater.	See response to General Comment #1.

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Comment No.	WDNR Comment per December 23, 2021 Letter	SWL&P Response
99	Section 8. PDF page 1252, Contingency Plan for Non-Compliance: In addition to extended monitoring to meet SWL&P's and Foth's 'remediation goals', add to this section that extended monitoring may be needed to meet the requirements for Site closure under Wis. Adm. Code ch. NR726.	Text has been updated to state that extended monitoring may be needed to meet the requirements for Site closure under Wis. Adm. Code ch. NR726. This possibility is considered in the Contingency Plan described in RAD, Section 1.6 and in the OM&M Plan, Section 7, and associated Table 1-1. The performance modeling for biosparge, enhanced MNA, and MNA effectiveness indicates the time to achieve the groundwater ES would be about 15 to 30 years. The quantitative trend toward this long-term goal could be determined using 8 quarterly groundwater sampling events. Additional monitoring events will be conducted if the decreasing groundwater trend cannot be statistically verified in 8 quarters of monitoring.
100	Section 8.2, PDF page 1252, Excavation Extents and Confirmation: Add a description of actions to be taken if confirmation samples concentrations are greater than SWL&Ps and Foth's Excavation target concentration of 5 mg/kg benzene.	If confirmation samples concentrations are greater than SWL&Ps and Foth's Excavation target concentration of 5 mg/kg benzene additional soil will be excavated if safely possible. Identification of soil >5 mg/kg benzene will be performed using the field GC.
101	Table 2-1, PDF page 1257, Footnote 4: The definition of Groundwater Protection RCLs is incorrect. A residual contaminant level based on the protection of groundwater is a numerical value expressing the concentration of a substance in soil which is considered protective of groundwater quality not protective of human health from direct contact. Correct this footnote.	See response to Comment #10.
102	Table 8-1, PDF page 1265, Verification Sample Results Evaluation Matrix, Non-impacted Soil: See General Comment #3.	See response to General Comment #3.
103	Table 8-1, PDF page 1265, Verification Sample Results Evaluation Matrix, Impacted Material: Is the reference to Impacted Material (benzene or naphthalene >100 ppm) supposed to be >10 ppm? If >100 ppm is correct this needs explanation in the table as well as in the text of the reports.	The landfill acceptance limit for benzene is 10 mg/kg which is the criteria to be used for verification sample results evaluation matrix, impacted material. The >100 ppm value will be revised to > 10 mg/kg value.
	Remedial Action Quality Assurance Plan	
104	No Comments	No changes required.
	Air Management Plan	
105	Section 2.10.1, PDF page 1452, Field Documentation: This subject needs further detail. What is the process for registering a complaint? What outreach will be conducted over what area to notify businesses and residents of the work that is occurring and how to register a complaint? When a complaint is received what is the process for investigation and resolution of the complaint?	Community outreach procedures will be discussed in the Communication Plan including the process for registering a complaint, outreach to be conducted over what area to notify businesses and residents of the work that is occurring and when a complaint is received what the process will be for investigation and resolution of the complaint.
106	Section 5, PDF page 1462, Public Communication, First Paragraph, Last Sentence: The DNR requests copies of all information supplied during this effort as well as a listing of business and properties contacted as well as detailed documentation of these efforts. The Douglas County Health Department should also be contacted and copied on the same information presented to the public. Add to this section that the DNR will be copied on any complaint received.	WDNR will receive copies of all information supplied during this effort as well as a listing of business and properties contacted as well as detailed documentation of these efforts. The Douglas County Health Department will also be contacted and copied on the same information presented to the public. WDNR will be copied on any complaint received.

SWL&P RESPONSE TO DNR COMMENTS ON THE 90% REMEDIAL ACTION DESIGN DELIVERABLES

SWL&P Former MGP Site, Superior, Wisconsin

Revised: Tuesday, March 29, 2022

Comment No.	WDNR Comment per December 23, 2021 Letter	SWL&P Response
	Continuing Obligations	
107	The DNR received copies of the notifications to affected off Site properties on December 1, 2021 from SWL&P. The notification submitted to the DNR did not contain figures or the cover letters. The DNR subsequently received copies of the entire submittals from the City of Superior and Graymont. The notifications provided to Graymont and the City of Superior are inadequate for the following reasons and will need to be resubmitted:	The notifications will be resubmitted with these changes implemented and new copies will be provided to DNR.
	• The cover letter to the notifications indicate they are draft.	DRAFT stamp will be deleted from documents.
	• The notifications are not signed by SWL&P.	Documents will be signed by SWL&P.
	• The notifications do not include a proper description of the extent of soil or groundwater contamination	Extent of soil and groundwater contamination will be revised to be consistent with revised figure, noted below, within the constraints of the amount of text allowed in the Form 4400. Additional description and information will be provided in the WDNR GIS Registry submittal (Form 4400-202).
	• The notifications do not depict the extent of soil or groundwater contamination on the included figures.	The approximate extent of soil and groundwater contamination will be illustrated on a revised figure.
	In order to complete the establishment of continuing obligations for the Site the DNR requires the resubmittal of the notifications as required in Wis. Adm. Code ch. NR725, submittal of a completed database package as required in Wis. Adm. Code ch. NR722.15(2)(d)6., and the database fees required in Wis. Adm. Code ch. NR749.04 Table 1 for sites with soil and groundwater contamination. SWL&P was notified a database package was required in the DNR's April 16, 2021 60% RAD letter. The corrected notifications, database package, and fees are needed prior to DNR approval of the final RAD.	The WDNR GIS Registry (Form 4400-202 and associated attachments) will be submitted with the 100% design as that is an integral element of the WDNR GIS Registry documentation. Corrected notifications will be submitted as noted above. Fees will be paid upon submittal of the 100% RAD.

Attachment 1b
Definitions for Standards

Table of Remedial Action Terms

SWL&P Upland Remedial Action Design

	1	2	3	5	6	7	8	9	10	11	12	13	14	15	16
SWL&P Report	**Preventive Action Limit - NR 140.05 (17)**	**Enforcement Standard - NR 140.05 (7)**	**Environmental Standard - NR 700.03 (20)**	**Industrial Shallow Soil Direct Contact RCL - NR 720.12**	**Groundwater Protection RCL - NR 720.10**	**Performance Standard - NR 720.03 (12m)**	**Soil Cleanup Standard - NR 716.13 (8)**	**Wastewater Discharge Limits**	**Landfill Acceptance Limits**	**(Site-Specific = 5 mg/kg benzene); Excavation Target Concentration**	**(Site-Specific = 1 mg/kg benzene); Biosparge Target Concentration**	**(Site-Specific = 1 mg/L benzene); MNA Target Concentration**	**Case Closure - NR 700.03 (3m)**	**Case Closure Criteria - NR 726**	**Design Criteria NR 724.15 (2)**
90% RD Report	X	X	X	X	X	X	X		X	X	X	X	X	X	X
OM&M Plan	X	X	X	X		X		X	X		X	X	X	X	X
FSP	X	X	X	X			X	X	X	X	X		X	X	X
CQAP				Tab 4-1				Tab 4-1	Tab 4-1				X		X
EC & SM Plan															
AMP															
RA QAPP															
RA HASP															

Definitions shown in red were revised 8/30/21 and should be revised generally in all applicable 90% RAD documents as shown above.

Performance standard should refer to a remedial action and not a numeric value.

The term "criteria" is not generally used to describe a specific numeric value, but a list of requirements.

Enforcement Standard (NR140.05 (7)– a numerical value expressing the concentration of a substance in groundwater, which is adopted under s. 160.07, Stats., and s. NR 140.10 or s. 160.09, Stats., and s. NR 140.12.

Preventive Action Limit (NR 140.05 (17)– a numerical value expressing the concentration of a substance in groundwater which is adopted under s. 160.15, Stats., and s. NR 140.10, 140.12 or 140.20.

Environmental Standard (NR 700.03 (20)) – those cleanup standards, performance standards, standards of control and other substantive and procedural requirements, criteria or limitations promulgated as a regulation or rule under or pursuant to federal environmental or state environmental or facility citing laws that specifically address a hazardous substance, pollutant, remedial action, location or other circumstances found at a site or facility.

Industrial Soil Direct Contact RCL (NR 720.12) – A numerical value expressing the concentration of a substance in soil which is protective of human health from direct contact of an industrial worker with contaminated soil. These values are calculated using scientifically valid procedures and toxicological values approved by WDNR and the default exposure assumptions identified in NR 720.12(3) or alternative assumptions specifically approved by WDNR.

Groundwater Protection RCL (NR 720.10) –A numerical value expressing the concentration of a substance in soil which is based on the anticipated residual contaminant levels in soil being protective of groundwater. These values are calculated using the WDNR RCL spreadsheet (WDNR, 2018).

Performance Standard (NR 720.03 (12m)) – a remedial action or, in some cases existing site conditions that prevent exposure to contaminants or will result in a decrease in contaminant concentrations, or both.

Soil Cleanup Standard (NR 720.03 (15) – either a residual contaminant level determined in accordance with ss. NR 720.10 or 720.12, or a soil performance standard determined in accordance with s. NR 720.08.

Wastewater Discharge Limits – pretreatment requirements for wastewater discharged to the City of Superior WWTP based on the local facility (SWL&P) discharge permit.

Landfill Acceptance Limits – Shamrock Disposal Facility Acceptance Limits. See FSP, Table 2-3. The benzene acceptance limit is 10 mg/kg.

Site-Specific Excavation Target Concentration - a target concentration less than or equal to 5 mg/kg benzene remaining in deep soil (>4 ft bgs) following excavation at the former MGP gas holder and former Hortonsphere areas. This target concentration was determined based on a site-specific cost benefit analysis of contaminant mass removal concentrations and volumes.

Site-Specific Biosparge Target Concentration - a target concentration of 1 mg/kg benzene remaining in deep soil (>4 ft bgs) following excavation and biosparging within the Limits of Active Remediation. This target concentration was determined based on a site conditions and modeled results of the biosparge system performance.

Site-Specific Enhanced MNA Target Concentration -a post excavation target concentration that approaches 1 mg/L benzene remaining in groundwater associated with deep soil (>4 ft bgs) following enhanced MNA over time. This target concentration was determined based on a site conditions and modeled results. This is not an environmental standard established by the WDNR. The long-term remedial action must comply with the requirements of Wis. Adm. Code chs. NR140 and NR700-NR799. The DNR will evaluate groundwater concentrations against the Wis. Adm. Code NR140 Groundwater Quality Standards.

Case Closure (NR 700.03 (3m)) – a determination by the agency with administrative authority, based on information available at the time of the review by the agency with administrative authority, that no further remedial action is necessary at a site.

Case Closure Criteria (NR 726) – General and specific criteria applicable to case closure as listed in NR 726.

Design Criteria (NR 724.15 (2)) – Construction specifications and operational limits set forth in the current Uplands Remedial Action Design Report, Drawings, and Specifications.

Attachment 2
Table 2-1 Field Sampling Plan

Table 2-1

Groundwater Enforcement Standards and Preventative Action Limits and Soil Industrial Direct Contact and Groundwater Protection Residual Contaminant Levels
Upland Area, Former Manufactured Gas Plant - Superior, WI

Analyte	Groundwater Enforcement Standard[1, 5] (µg/L)	Groundwater Preventive Action Limit[2 5] (µg/L)	Industrial Shallow Soil (<4 ft) Direct Contact Residual Contaminant Level[3] (mg/kg)	Groundwater Protection Residual Contaminant Level (mg/kg)[4, 5]	Site-specific Excavation Target Concentration (mg/kg)	Site-specific Enhanced MNA Target Concentration (mg/L)	Site-speciic Biosparge Target Concentration (mg/kg)
VOCs							
Benzene	5.00	0.50	7.07	0.005	5.00	1.00	1.00
Toluene	800	160	818	1.11	---	---	1.79
Ethylbenzene	700	140	35.40	1.57	---	---	1.57
Xylenes (Total)	2,000	400	260	3.96	---	---	10.48
Styrene	100	10	867	0.22	---	---	---
SVOCs							
Naphthalene	100	10	24.1	0.66	---	---	4.93
Acenaphthylene	---	---	---	---	---	---	---
Acenaphthene	---	---	45,200	---	---	---	---
Fluorene	400	80	30,100	14.83	---	---	---
Phenanthrene	---	---	---	---	---	---	---
Anthracene	3,000	600	100,000	196.95	---	---	---
Fluoranthene	400	80	30,100	88.88	---	---	---
Pyrene	250	50	22,600	54.55	---	---	---
Benzo(a)anthracene	---	---	20.8	---	---	---	---
Chrysene	0.2	0.02	2,110	0.14	---	---	---
Benzo(b)fluoranthene	0.2	0.02	21.1	0.48	---	---	---
Benzo(k)fluoranthene	---	---	211	---	---	---	---
Benzo(a)pyrene	0.2	0.02	2.11	0.47	---	---	---
Dibenz(a,h)anthracene	---	---	2.11	---	---	---	---
Benzo(g,h,i)perylene	---	---	---	---	---	---	---
Indeno(1,2,3-cd)pyrene	---	---	21.1	---	---	---	---

Abbreviations:
µg/L = micrograms per liter
ft = foot/feet
mg/kg = milligrams per kilogram
NA = not applicable
ND = not detected
RCL = residual contaminant level
SVOC = semi-volatile organic compound
VOC = volatile organic compound

Prepared by: EWV
Checked by: BDS1

Notes:

[1] **Enforcement Standard (NR140.05 (7)** – a numerical value expressing the concentration of a substance in groundwater which is adopted under s. 160.07, Stats., and s. NR 140.10 or s. 160.09, Stats., and s. NR 140.12.

[2] **Preventive Action Limit (NR 140.05 (17)** – a numerical value expressing the concentration of a substance in groundwater which is adopted under s. 160.15, Stats., and s. NR 140.10, 140.12 or 140.20.

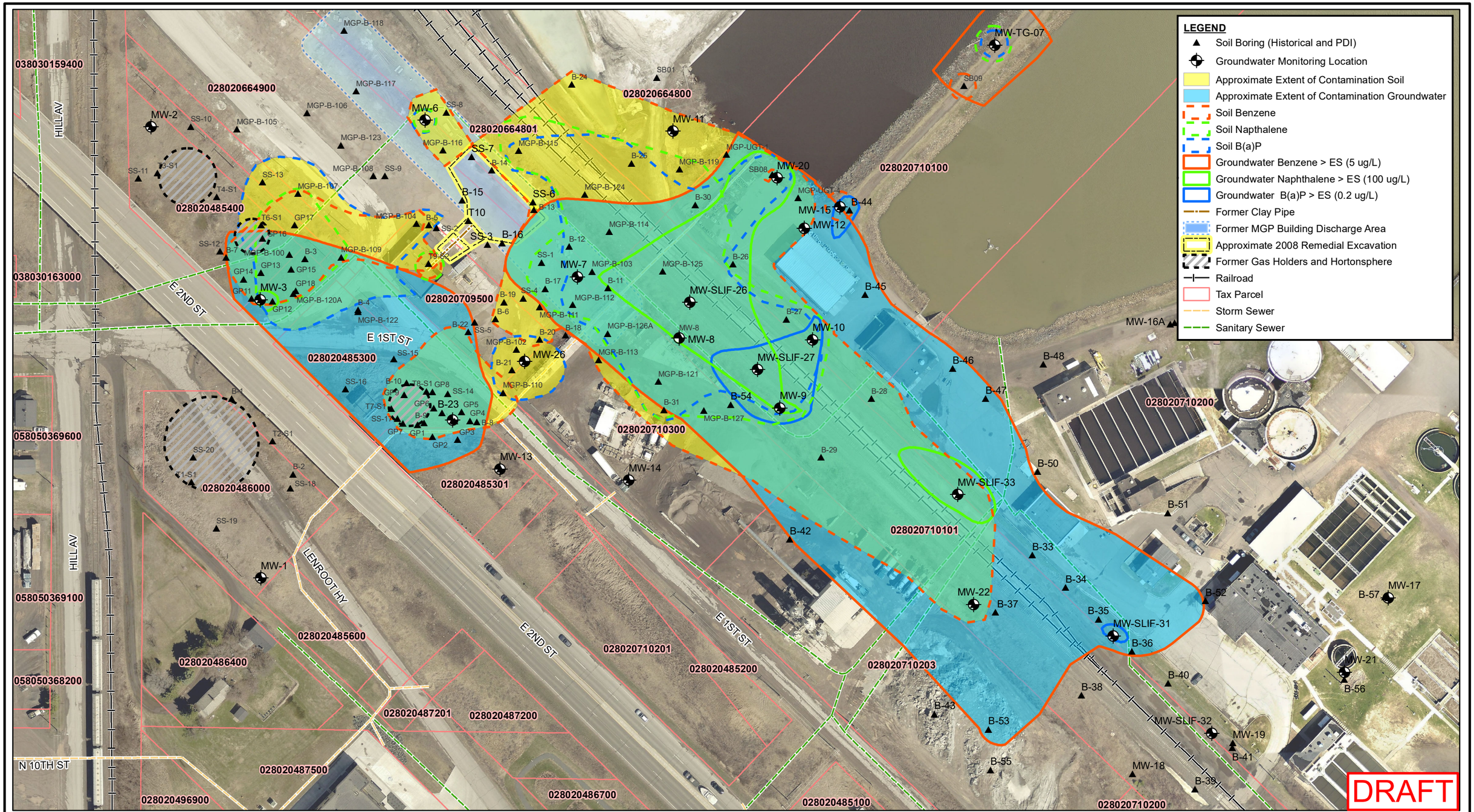
[3] **Industrial Soil Direct Contact RCL (NR 720.12)** – A numerical value expressing the concentration of a substance in soil which is protective of human health from direct contact of an industrial worker with contaminated soil. These values are calculated using scientifically valid procedures and toxicological values approved by WDNR and the default exposure assumptions identified in NR 720.12(3) or alternative assumptions specifically approved by WDNR.

[4] **Groundwater Protection RCL (NR 720.10)** – A numerical value expressing the concentration of a substance in soil which is based on the anticipated residual contaminant levels in soil being protective of groundwater. These values are calculated using the WDNR RCL spreadsheet (WDNR, 2018).

[5] Including the ES, PAL, and Groundwater Protection RCL in this table does not imply the criteria will be met at RA completion.

Attachment 3

Figure 2-6



NOTES:

1. 2019 - 3" resolution air photo from Douglas County.
2. Horizontal coordinate system: NAD 1983 Douglas County, units in feet.
3. Groundwater impacts were estimated based on the maximum concentration observed between the April 2017 and July 2020 (PDI) monitoring events. The extent of groundwater contamination is delineated as exceedances of the WDNR NR 140 Enforcement Standard (ES).
4. Soil impacts were estimated from historical and PDI sample data. The extent of soil contamination is delineated as exceedances of the WDNR. Industrial soil direct-contact RCL for soil 0-4 ft bgs or soil to groundwater protection RCL for soil >4 ft bgs.
5. Parcels supplied by Douglas County GIS.

Industrial Soil D-C RCL
- Benzene <7.07 mg/kg
- Naphthalene <24.1 mg/kg
- Benzo(a)pyrene <2.11 mg/kg

Soil to Groundwater Protection RCL
- Benzene <0.0051 mg/kg
- Naphthalene <0.6582 mg/kg
- Benzo(a)pyrene <0.478 mg/kg

SWL&P

Foth

N

0 50 100 Feet

SUPERIOR WATER, LIGHT & POWER

FIGURE 2-6

APPROXIMATE EXTENT OF COMBINED SOIL AND GROUNDWATER CONTAMINATION
REMEDIAL ACTION OPTIONS REPORT, SEDIMENT AREA
SUPERIOR, WISCONSIN

Date: MARCH 2022	Revision Date:	
Drawn By: SGL	Checked By: BDS1	Project: 18S024

Path: Q:\Superior Water Light and Power\18s024\GIS\mxd\Draft\SiteBoundaryBasedOnChemistry.mxd Date: 3/22/2022