

STATE OF UTAH
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY
WATER QUALITY BOARD
PO BOX 144870
SALT LAKE CITY, UTAH 84114-4870

**Ground Water Discharge Permit
Permit No. UGW450012**

In compliance with the provisions of the Utah Water Quality Act, Title 19, Chapter 5, Utah Code Ann., the Act,

**US Magnesium LLC
236 North 2200 West
Salt Lake City, Utah 84116**

hereafter referred to as the Permittee or as US Magnesium, is granted a Ground Water Discharge Permit for wastewater ponds and other facilities related to the production of magnesium metal from brine derived from the Great Salt Lake 15 miles north of Exit 77 of I-80 in Rowley, Tooele County, Utah. The magnesium production facility is located at Latitude 40° 54' 45.0684" North, Longitude 112° 43' 55.1795" West, in the NE ¼ of NW ¼ of Section 15, Township 2 North, Range 8 West (Salt Lake Base and Meridian). The permit is being renewed and modified to cover the continued construction of the Retrofitted Waste Pond.

This permit is based on representation made by the Permittee and other information contained in the administrative record. It is the responsibility of the Permittee to read and understand all provisions of this permit.

The facility shall be constructed and operated in accordance with conditions set forth in the permit and the Utah Administrative Rules for Ground Water Quality Protection (Utah Admin. Code R317-6).

This permit shall become effective on _____, 2022.

This permit and authorization to operate shall expire at midnight _____, 2027.

Signed this _____ day of June, 2022.

Erica Gaddis, PhD
Director

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I. CONSTRUCTION PERMIT

A. Summary of Construction Project

A Retrofitted Waste Pond (RWP) is proposed for the US Magnesium Facility (Facility) to meet requirements outlined in Utah Administrative Code (UAC) R317-6, Ground Water Quality Protection and will require construction of pond embankments and a vertical hydraulic barrier wall (VHBW) along the cross-gradient and downgradient sides of the RWP. The RWP will be designed in four phases; Phase 1 will include the RWP perimeter earthen embankment which will be constructed to the height of the planned VHBW; Phase 2 will include the installment of the VHBW; Phase 3 will include the additional embankment height above the top of the VHBW to final crest elevation, freeboard requirements, erosion protection installation, monitoring well extension and protection, and crest material placement; and Phase 4 will include the monitoring system design, installation, and evaluation.

The proposed discharge control system design concept, as presented in the US Magnesium Groundwater Discharge Control Plan, consists of combining the current waste pond (CWP) and old waste pond (OWP) into one large RWP by installing a perimeter embankment and a VHBW that keys into a low-permeability confining layer, the Deeper Silty Clay Unit.

Phase 1

The RWP earthen embankment will be constructed as a split pad design consisting of a trenching pad (constructed to the maximum predicted RWP operating water elevation of 4218 ft above mean sea level (amsl)) and a mixing pad (constructed to an elevation of 4213.5 ft amsl). The trenching pad will have a minimum crest width of 22.5 ft to provide a sufficient working platform for the VHBW to be installed. The mixing pad will be constructed on the outboard slope of the embankment to a width of 23 to 27 feet depending on the depth of the VHBW trench to the maximum predicted RWP operating water level of 4218 ft above mean sea level (amsl) and will have a minimum crest width of 30 ft to provide a sufficient working platform for the VHBW to be installed during Phase 2. The embankment will be constructed of homogenous earthen fill with 4H:1V (horizontal to vertical ratio) inboard slope and a 3H:1V outboard slope. Soils used for the construction of the embankment will be generated from the borrow source area (BSA) to a depth of 5 to 7 feet which has been identified as clay lithology. Excavation of clay material from the BSA will cease at any depth where oolitic sands are encountered.

In some areas along the RWP alignment, the embankment will be constructed over previously constructed dikes. In these areas, the dikes will be scarified and re-compacted to the required specifications. Foundation soils will be placed in lifts and compacted to 90% of the maximum dry density (MDD) and plus or minus 2% of the optimum moisture content (OMC), as determined by Standard Proctor testing. The embankment soils will be placed in lifts and compacted to either 90% or 95%, based on a tiered approach.

In areas along the alignment where the embankments will be constructed within the existing RWP footprint, there is variation in design specifications, depending on location. Foundation improvement will consist of over-excavating soils within the footprint of the embankment to two feet with scarification and re-compaction, backfilling with material from the BSA in lifts, and compacting the lifts to 90%

MDD and plus or minus 2% of the OMC, as determined by Standard Proctor testing. All existing groundwater monitoring wells and piezometers will be protected and extended to final surface elevations of the RWP barrier wall during Phase 3.

Phase 2

The VHBW will be constructed by excavating a trench (minimum width of 30 inches) in the center of the footprint of the constructed earthen embankment to a depth which extends at least three feet into the confining lake bed clay layer (Deeper Silty Clay Unit). The VHBW will extend to the surface elevation of the constructed embankment (4218 ft amsl). The terminal depth of the trench and the elevation of the Deeper Silt Clay Unit will be observed by the QC Monitor(s) and the VHBW Specialist at 20 ft intervals; grab samples will be collected from the top of the clay layer and analyzed for grain size distribution (ASTM D422) and Atterberg Limits (ASTM D4318) at 500 ft intervals.

During excavation activities, a sepiolite based slurry will be introduced into the trench to an elevation of less than one foot below the platform elevation to ensure the stability of the trench. The VHBW will be constructed using a soil-sepiolite backfill which will consist of cuttings excavated from the VHBW trench, sepiolite clay, and sepiolite trench slurry. The soil-sepiolite backfill material will be staged next to the trench, mixed, and placed back into the trench in compliance with the procedures identified in the Retrofitted Waste Pond Phases 1 and 2 Basis for Design Report (Appendix D). Oolitic sands will be separated from the cuttings as much as practicable to minimize incorporation into the VHBW backfill material and will be placed inside the boundaries of the RWP. If additional soil is required for the VHBW backfill material, it will be obtained from the on-site borrow area.

The soil-sepiolite backfill material will be evaluated for quality control by frequently testing for particle size and density, and less frequently testing the hydraulic conductivity of the material to ensure that the in place hydraulic conductivity of the completed VHBW is 1×10^{-6} cm/sec or less. Material testing frequencies must comply with the testing requirements in Table 1 located in Appendix F – Earthwork and HBW Specifications of the Retrofitted Waste Pond Phases 1 and 2 Basis of Design Report (Appendix D). A two-foot-thick clay soil cap will be placed over the completed sections of the VHBW to protect it from damage. The clay cap material will be obtained from the outboard side of the constructed embankment. The final embankment will be completed and raised as part of Phase 3.

Phase 3

Following construction of the VHBW, the embankment will be raised to a final design elevation of at least 4220 ft amsl, to supply the RWP with the necessary two feet of vertical freeboard and erosion protection. During construction activities, all existing groundwater monitoring wells will be protected, extended above the final embankment elevation, and secured in protective casings.

Phase 4

A monitoring system will be designed, installed and evaluated to ensure that the RWP remains functional and that any leaks or deficiencies are detected and addressed in a timely and efficient manner. Phase 4 of the RWP Construction

Project will be evaluated separately once Plans and Specifications are submitted to the Division.

B. Authorization to Construct

The construction of the earthen embankment under Phase 1 and the VHBW under Phase 2 of the RWP Construction Project is authorized by the Division in accordance with the Phase 1 and Phase 2 RWP Construction Permit, Plans, and Specifications provided in Appendix D.

The construction of Phase 3 of the RWP Construction Project is tentatively approved pending the submittal of Plans and Specifications, and the issuance of a Construction Permit by the Division.

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II. SPECIFIC PERMIT CONDITIONS

A. Ground Water Classification

Ground water underlying the site has total dissolved solids (TDS) content greater than 10,000 mg/l, and so qualifies as Class IV, saline ground water. Because of the upward hydraulic gradient observed at the site, shallow ground water may rise to the surface where it supports the ecosystem of the salt flats area, and potentially the Great Salt Lake. Accordingly, shallow ground water also qualifies as Class IC, ecologically important ground water. Shallow ground water will be protected against adverse environmental effects that would occur if it discharged to the surface.

Compliance levels in monitoring wells will not be used in this version of the permit, because it is preferable that wells be located in uncontaminated ground water that could be affected by discharges from US Magnesium's facilities. When US Magnesium has completed investigations into site conditions and environmental risks posed by contaminants in its wastewater, if groundwater contamination extends beyond the perimeter of the Retrofitted Waste Pond, monitor wells will be located in uncontaminated ground water immediately adjacent to the contaminant plume outside the RWP. In addition, if, based on the Contamination Investigation, groundwater contamination is observed outside the RWP the final Compliance Monitoring Plan will include any such area(s). After collection of background water quality data, protection levels will be developed for these wells that are protective of the environment, and this permit will be modified to incorporate the protection levels.

Areas of Class III ground water (limited use ground water) may exist in the western part of US Magnesium's property, upgradient of the permitted facilities.

B. Permitted Facilities

Prior to modifications as described herein and in the Statement of Basis, this permit will cover the following existing facilities:

1. The CWP is a diked, unlined impoundment of approximately 525 acres located northeast of the US Magnesium plant site. Constructed in 1985, this pond currently receives wastewater discharges from a piping system that discharges into the CWP. The unlined ditches were replaced with a wastewater piping system in a project completed on February 20, 2019, closed (by backfilling the ditches) in a project completed in December 2019, and capped in July 2020. The CWP includes the Southeast Poned Waste Lagoon (350 acres) and the Northwest Poned Waste Lagoon (175 acres) so the total acreage of the CWP is 525 acres.
2. The OWP, is a diked, unlined area of approximately 835 acres that was constructed in the 1970s and abandoned in 1984 due to being inundated by high water levels in the Great Salt Lake. Maintenance of the north and east embankments was completed on November 26, 2019 to preserve the function of the OWP. This pond receives drainage from the CWP.
3. The earthen berm separating the CWP and the OWP that currently maintains a wastewater elevation difference between the impoundments.

4. A pipe installed by US Magnesium in November, 2017 to convey wastewater from the CWP to the OWP. The pipe was installed in order to maintain lower water levels and minimize hydraulic head on the pond dikes and decrease the possibility for wastewater to escape the ponds by underground or surface flow.
5. Any other plant facilities, including plant operations that may cause a discharge of contaminants to ground water.

As US Magnesium completes remedial actions required by other State and Federal agencies, other facilities to contain wastewater will be constructed, primarily the RWP which will be partially surrounded by a subsurface vertical hydraulic barrier wall to minimize the lateral flow of wastewater that has infiltrated the sediments underlying the waste pond (Figure 1). Current plans do not include construction of a subsurface barrier on the upgradient (west-southwest) side of US Magnesium’s facilities because ground water modeling to date suggests that subsurface wastewater will not overcome the prevailing regional ground water gradient and discharge from this side. A low-permeability sedimentary stratum (Deeper Silty Clay) underlying the pond will minimize downward flow. As these new facilities are completed, this permit will be modified to provide appropriate monitoring of the performance of structures intended to contain wastewater. Future permit modifications will be subject to applicable administrative procedures.

C. Enforceable Design Submittal and Construction Timetable

US Magnesium has submitted Final Plans and Specifications for Phase 1 and Phase 2 of the RWP Construction Project. The Division has approved the Plans and Specifications and has issued a Construction Permit for these activities. Phase 3 of the RWP Construction Project has been tentatively approved pending the submission of Plans and Specifications by US Magnesium and the issuance of a Construction Permit by the Division. US Magnesium shall submit Final Plans and Specifications for subsequent phases of the RWP consistent with the deadlines in Table 1A.

Table 1A. Design Submittal Deadlines

Phase	Design Deliverable Task	Deadline
1	Phase 1- Submit Phase 1 embankment design and construction plans	December 19, 2019
2	Phase 2 – Submit vertical hydraulic barrier wall (VHBW) design and construction plans	December 19, 2020
3	Phase 3 – Submit final Phase 3 embankment and slope protection design and construction plans	December 19, 2022
4	Phase 4 – Submit Compliance Monitoring system final design and consistent with the Compliance Monitoring Plan drawings	December 19, 2023

Consistent with the DWQ Construction Permit for each phase issued by the Director, US Magnesium will begin construction of that phase. US Magnesium will notify DWQ within one year of DWQ issuing a Construction Permit for each phase in the event that force majeure event(s) which have the potential to or have

prevented US Magnesium from commencing construction. Based on the design deliverable deadlines and DWQ’s timelines for issuance of Construction Permits for each phase of construction, the construction start deadlines, based on anticipated schedule for DWQ Construction Permits, are stated in Table 1B.

Table 1B. Construction Start Deadlines

Phase	Construction Task	Deadline
1	Embankment construction	July 2021
2	VHBW construction	August 2022
3	Embankment and slope protection construction	May 2024
4	Compliance monitoring system installation and start-up	May 2025

D. Discharge Minimization Technology

US Magnesium replaced the unlined ditches that formerly conveyed wastewater to the Current Waste Pond and Old Waste Pond with a pipeline system in February 2019, closed (backfilled) the ditches in December 2019, and capped the ditches in July 2020. Organic contaminant concentrations in the wastewater will be minimized by construction and operation of a new filtration plant pursuant to the Consent Decree between the United States and US Magnesium effective June 30, 2021 (Appendix E).

The existing wastewater ponds will be operated in a manner that minimizes the discharge of wastewater to shallow ground water and surface water. The ponds and embankments will be regularly inspected for evidence of wastewater discharge to the adjacent ground surface and surface water according to the Inspection and Monitoring Plan contained in Appendix A. If any discharge is confirmed, US Magnesium will contain it and prevent it from discharging to surface water as described in Appendix A: Contingency Plan of the Inspection and Monitoring Plan located in Appendix A of this Permit.

E. Best Available Technology Standard for New Construction

Any construction, modification, or operation of new waste or wastewater disposal, treatment, or storage facilities shall require review of engineering design plans and specifications. All engineering plans or specifications submitted shall demonstrate compliance with all Best Available Technology requirements stipulated by the Utah Ground Water Quality Regulations (Utah Admin. Code R317-6). For the construction of any new facilities, this permit will be re-opened and modified to include said Construction Permit changes, upon approval by the DWQ Director.

F. Monitoring

1. Facility Inspection

US Magnesium shall conduct regular inspections of the Current Waste Pond and Old Waste Pond embankments and other facilities according to the procedures outlined in Appendix A. In addition, US Magnesium will conduct regular inspections of both sides of the entire perimeter of the earthen embankment surrounding the RWP. The main purpose for these inspections is to identify sites where wastewater may be escaping from the embankments by subsurface or surface flow, for evaluation and maintenance if necessary. If visual inspections identify any sites where

water is discharging from the embankments or subsurface, the discharges shall be contained and prevented from flowing to surface water outside the RWP.

2. Monitoring of Pond Water Elevations

US Magnesium shall monitor water elevations in the Current Waste Pond and Old Waste Pond weekly. If action level elevations as defined in Part II.H.3 are exceeded, US Magnesium will take actions to prevent exceedance of the maximum water elevations as defined in Part II.H.3. Depending on the relative water elevations between the two ponds, such actions may include installation of additional piping through the dike separating the Current Waste Pond and Old Waste Pond or increasing the capacity of the Current Waste Pond by excavating the non-inundated areas within the Current Waste Pond footprint. Excavated materials will be placed within the Current Waste Pond footprint.

3. Ground and Surface Water Monitoring

US Magnesium shall follow the Interim Compliance Monitoring Plan contained in Appendix B. US Magnesium will sample nine monitor wells (4 screened above the Deeper Silty Clay and 5 screened below it) and six surface water locations to determine baseline conditions. For long-term monitoring, sampling of the nine monitoring wells will continue. In addition, the Interim Compliance Monitoring Plan currently monitors for five organic compounds to trace any influence of the wastewater on ground or surface water, following the completion of baseline analysis for the full suite of organic compounds present in the wastewater. The compounds chosen are trichloroacetic acid, bromoform, chloroform, dibromodichloromethane and bromodichloromethane. Water samples will also be tested for the field parameters of temperature, pH, specific conductivity, dissolved oxygen, oxidation reduction potential (ORP), turbidity and field chlorine. Samples from each monitoring point have been analyzed for the full suite of compounds (Table 4-3 of Appendix B: Interim Compliance Monitoring Plan) to allow for comparison with tracer compound analyses. At least eight samples from each monitoring point will be collected, in three quarters every year (spring, summer, and fall). Most of the monitoring points are inaccessible in winter. Concurrent with the long-term monitoring well sampling of the monitoring points, US Magnesium shall sample the surface water sampling points for field parameters and the organic wastewater tracers three quarters per year (spring, summer and fall). Monitoring shall continue until the new monitoring plan required to be developed in Part II.I.4 is implemented.

All water sampling and analysis required by this permit shall be conducted under the appropriate sampling plan. The Interim Compliance Monitoring Plan (Appendix B) includes both a Ground Water and Surface Water Sampling and Analysis Plan as an interim groundwater monitoring program for US Magnesium prior to RWP construction. The construction work conducted under the Phase 1 and Phase 2 Basis of Design Report for the Retrofitted Waste Pond is handled under the Construction Quality

Assurance Plan (Tetra Tech. Retrofitted Waste Pond Phase 1 and Phase 2 Basis of Design Report - US Magnesium Facility, Appendix D October 29, 2021).

All compliance monitoring wells must be protected from damage or from contamination due to surface spills. They shall be maintained in full operational condition for the life of this permit. Any well that becomes damaged beyond repair or is rendered unusable by any cause shall be replaced by the Permittee within 90 days or as directed by the DWQ Director. All wells that become inaccessible due to new construction or wells that are within the alignment of the new construction, or are otherwise not expected to be used for monitoring, shall be properly abandoned. Wells that are abandoned may be required to be replaced by the Permittee within 90 days in an alternative location as directed by the DWQ Director.

G. Reporting Requirements

US Magnesium shall keep reports on facility inspections and pond water level monitoring required in Parts II.F.1 and 2 on file and make them available for inspection by representatives of DWQ during normal business hours.

All reporting information will be supplied to the Director as a hard copy report and digitally in pdf format. In addition, all analytical results and water level elevations will be supplied to the Director in an electronic format such as Microsoft Excel or a comparable file format.

1. Quarterly Reporting

US Magnesium shall submit quarterly reports on monitoring activities required under this permit according to the schedule in Table 2. Reports shall consist of the following:

a. Facility Inspection

US Magnesium shall report any occurrences of standing water or discharging ground water adjacent to the north, east and south embankments of the Current and Old Waste Ponds and RWP. US Magnesium shall report any field analyses made to evaluate whether the water was affected by discharge of wastewater, and, if analyses show the water was affected by a wastewater discharge, efforts to contain it and prevent it from flowing to other surface water. Records of inspections made according to the Inspection and Monitoring Plan in Appendix A shall be kept and made available to DWQ representatives upon request.

b. Pond Water Elevations

US Magnesium shall report quarterly on any exceedances of the action water elevations in either the Current or Old Waste Ponds, and actions being taken to ensure safe water elevations will be maintained.

c. Ground Water Monitoring

For quarters in which ground and surface water sampling has taken place, US Magnesium shall provide the full laboratory report

including the analytical results, laboratory quality assurance/quality control (QA/QC), and any field notes associated with the sampling.

2. **Tracer Parameter Evaluation Reporting**
Once US Magnesium has analyzed one sample from each monitoring point for the full suite of organic parameters and received validated laboratory data, including the proposed trace parameters, it shall submit a report compiling the results and evaluating the possible use of the tracer parameters as a proxy for the full suite of analytes.
3. **Noncompliance Reporting**
If US Magnesium becomes aware of any of the following situations, verbal notice must be provided to the DWQ Director with 24 hours of discovery and written notice within 5 business days. The written notice must contain a plan and timetable for restoring the facility to compliance.
 - a. Ground or surface water affected by the wastewater is escaping containment and discharging to surface water outside and adjacent to the embankments of the Current Waste Pond and/or Old Waste Pond.
 - b. Maximum pool elevation in either the Current or Old Waste Ponds has been exceeded.
 - c. The pipe connecting the Current and Old Waste Ponds is not operating as designed.

Table 2. Report Due Dates

Quarter	Report Due Date
First (Jan. Feb. Mar.)	May 15
Second (Apr. May June)	August 15
Third (July Aug. Sept.)	November 15
Fourth (Oct. Nov. Dec.)	February 15

H. Requirements for Compliance

Compliance with the terms of this permit requires the following:

1. Regular inspections of the pond perimeters are conducted according to the Plan contained in Appendix A, and any indications of discharge of wastewater to the surface outside and adjacent to the Current Waste Pond and/or Old Waste Pond are reported to the DWQ Director and contained and prevented from flowing to surface water as stated in the Interim Compliance Monitoring Plan in Appendix B.
2. Ground and surface water sampling is conducted according to the Interim Compliance Monitoring Plan in Appendix B and the results reported to DWQ according to permit conditions.
3. Maximum pool elevations are not exceeded. Water surface elevations in the Current Waste Pond must be below 4217.0 feet above mean sea level (amsl) and in the Old Waste Pond below 4207.5 feet amsl. If water elevations exceed action levels of 4216.5 feet amsl in the Current Waste Pond or 4207.4 feet amsl in the Old Waste Pond, US Magnesium

shall take appropriate actions to minimize further rise of water levels and report these conditions to the DWQ Director according to Part II.F.1(b). If action level elevations are exceeded, US Magnesium shall take timely actions to prevent exceedance of maximum pool elevations.

4. US Magnesium meets the stated deadlines for construction of the Retrofitted Waste Pond and completion of the permit's other Compliance Schedule items, or obtains DWQ approval for extending those deadlines.
5. Construction of any new facility or modification of any existing facility must be permitted in accordance with Utah Code Ann. § 19-5-107(3)(b) and Utah Admin. Code R317-1.

I. Compliance Schedule

1. Human Health and Ecological Risk Assessments

The Human Health and Ecological Risk Assessment (Risk Assessment) was initially scheduled to be completed within two years of the initial permit (December 19, 2018). An extension approval letter was issued by the Division on December 23, 2020 which indicated that the completion date would be consistent with the CERCLA Administrative Settlement and Order of Consent (AOC) for Remedial Investigation / Feasibility Study (RIFS) as updated in the RIFS AOC required monthly reports. The Division approved extension request requires US Magnesium to submit the HHRA and ERA within 10 working days of submittal to EPA as required in the RIFS AOC.

Consistent with the Division approved extension, US Magnesium submitted the Draft HHRA to the Division on June 4, 2021 and the Draft ERA on July 21, 2021. The final risk assessment reports are expected to meet the requirements for the CERCLA RIFS. The final report to the Director must identify concentrations of each contaminant which may have no adverse human health or ecological effects if they were released as surface water at US Magnesium's site.

2. Contamination Investigation

The contamination investigation was initially scheduled to be completed within two years of the initial permit (December 19, 2018). An extension approval letter was issued by the Division on December 23, 2020 which indicated that the completion date would be consistent with the RIFS AOC as updated in the RIFS AOC required monthly reports. The Division approved extension request requires US Magnesium to submit the HHRA and ERA within 10 working days of submittal to EPA as required in the RIFS AOC.

US Magnesium shall submit to the Director within 10 business days after US Magnesium submits to EPA the Draft and Final RI Reports required under the RIFS AOC a report that fulfills the requirements of Utah Admin. Code R317-6-6.15D for a Contamination Investigation. Information from this investigation will be used to justify the design of containment structures, develop a site-wide monitoring plan, and a closure plan. The report must address:

- a. The extent and severity of existing ground and surface water

- contamination.
- b. Evaluation of actual and potential pathways for contaminant migration, both at the surface and in the subsurface.
 - c. Evaluation of discharges to ground or surface water at the facilities of the plant site.
 - d. Investigation of the stratigraphy, permeability, ground water flow, and potential contaminant migration pathways in the future open western side of the subsurface barrier wall.
 - e. Ground water quality upgradient of the US Magnesium facilities.
 - f. The potential for ground water flow through the Deeper Silty Clay Layer unit.
 - g. Stability analysis of the wastewater impact on the structural integrity of the earthen berm and VHBW due to mechanical and chemical erosion of the embankments for the short and long term embankment maintenance requirements.

3. **Final Barrier Wall Design and Justification**

US Magnesium shall construct Phase 1 and Phase 2 of the Retrofitted Waste Pond, which includes the earthen berm and the low-permeability VHBW according to the plans and specifications cited in Part I of this permit. Phase 3 of the RWP is tentatively approved pending the submittal of Plans and Specifications by US Magnesium, and the issuance of a Construction Permit by the Division. US Magnesium shall submit plans and specifications for the construction of subsequent phases of the RWP. DWQ must approve any alternative schedule and design at least two months before the anticipated start of construction. This permit shall be re-opened to incorporate a Construction Permit for future construction phases of the RWP. Future modified versions of this permit shall be subject to applicable administrative procedures, including public notice.

The design and anticipated performance of the pond's barrier wall must be verified with all known data on the hydrogeological properties of the sediments underlying the future Retrofitted Waste Pond obtained in the Contamination Investigation, interim monitoring data obtained to date, other investigations and/or studies, and the ground water flow model, including any appropriate modifications to the model.

4. **Future Compliance Monitoring Plan**

Within six months of DWQ approval of the Contamination Investigation report, US Magnesium shall submit a proposed compliance monitoring plan for use after construction of the subsurface vertical hydraulic barrier wall (VHBW) and the Retrofitted Wastewater Pond. The plan must evaluate the following lines of evidence related to performance of the retrofitted pond:

- a) Effectiveness of the subsurface wall as a barrier to ground water flow will be measured at pairs of piezometers located on opposite sides of the wall at locations around its perimeter, by regular measurement of static water levels in each piezometer. The piezometers will be constructed to allow for ground water sampling, if necessary, and routine monitoring will include measuring field pH

and field oxidation-reduction potential in each piezometer.

- b) Monitoring wells must be placed in locations that will evaluate potential subsurface discharge of wastewater from the Retrofitted Waste Pond, including flow out of the open western side of the Retrofitted Waste Pond and flow along the pond perimeter, particularly in any zones of higher permeability in the Upper Aquifer Zone, and downward flow through the Deeper Silty Clay Layer unit. Placement of wells or other monitoring points must be based on the best available hydrogeological information obtained in required investigations of this area, and ground water modeling incorporating this information.

5. **Isotope Analysis Evaluation**

US Magnesium conducted Phase I of a study on the feasibility of using stable isotopic composition of water to distinguish uncontaminated water at the plant site from water that is influenced by the plant's wastewater according to the plan contained in Appendix C and submitted as the Isotope Study Phase I, Proof-of-Concept Sampling Report to DWQ on February 14, 2020. The Phase I study results did not indicate a distinct isotopic signature between facility wastewater and groundwater in compliance wells and did not support proceeding with the Isotope Study Phase II. However, isotope analyses may be worth reevaluating as a component of the final Compliance Monitoring Plan after the RWP construction is completed and is in operation. Future versions of this permit may use isotopic composition of water samples to evaluate permit compliance.

6. **Contingency Plan**

Concurrent with submittal of final plans for the Retrofitted Waste Pond, US Magnesium shall propose conceptual plans which would be followed if monitoring reveals that assumptions made in designing the containment structures turn out to not be true in practice, particularly if wastewater is found to discharge through the Deeper Silty Clay layer or out the open western side of the subsurface barrier wall. Plans must be based on known site conditions, interim monitoring data obtained to date, other investigations and/or studies, and any appropriate modification(s) to the existing ground water model.

7. **Evaluation of Sediment Acid Neutralizing Potential**

Within one year of permit issuance and as part of the justification for the Phase 1 design and specifications submitted to DWQ on June 26, 2019, US Magnesium re-calculated the acid neutralization potential of the sediments underlying the Retrofitted Waste Pond and the pond water balance for the Retrofitted Waste Pond, using calculation methods comparable to those used for the "Geochemical Evaluation of Sediments Beneath the CWP (Current Waste Pond)" and the "Water Balance Model and Results," contained in US Magnesium's December 15, 2017 Ground Water Discharge Permit Application. US Magnesium shall also re-evaluate the acid neutralizing potential of sediments underlying the impounded area using soil sample collection and analysis, and calculation methods comparable to the above-referenced Geochemical Evaluation

document prior to beginning construction of Phase 3 of the RWP. US Magnesium has agreed to conduct this evaluation concurrently with the construction of Phase 2 of the RWP.

8. **Closure Plan**

US Magnesium shall submit a final closure plan for the site in compliance with the Consent Decree (Appendix E). The current closure plan for the RWP area is included in Appendix No. 4(A) of the Consent Decree and contains the Salt Cap Closure and Post-Closure Plan.

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III. MONITORING, RECORDING AND REPORTING REQUIREMENTS

A. Representative Sampling

Measurements and samples taken in compliance with the monitoring requirements established under Part I shall be representative of the monitored activity.

B. Analytical Procedures

Water sample analysis must be conducted according to test procedures specified under Utah Admin. Code R317-6-6.12, unless other test procedures have been specified in this permit.

C. Penalties for Tampering

The Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six months per violation, or by both.

D. Reporting of Monitoring Results

Monitoring results obtained for each monitoring period specified in the permit, shall be submitted to the Director, Utah Division of Water Quality at the following address no later than 45 days after the end of the monitoring period:

**Utah Division of Water Quality
PO Box 144870
Salt Lake City, Utah 84114-4870
Attention: Ground Water Protection Program**

E. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any Compliance Schedule of this permit shall be submitted no later than 14 days following each schedule date.

F. Additional Monitoring by the Permittee

If the permittee monitors any pollutant more frequently than required by this permit, using approved test procedures as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted. Such increased frequency shall also be indicated. Additional monitoring results will be sent to DWQ (agencies) within 30 days of completed monitoring activities.

G. Records Content

Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements.
2. The individual(s) who performed the sampling or measurements.
3. The date(s) and time(s) analyses were performed.
4. The individual(s) who performed the analyses.
5. The analytical techniques or methods used.
6. The results of such analyses.

H. Retention of Records

The permittee shall retain records of all monitoring information, including all calibration and maintenance records and copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 10 years from the date of the sample, measurement, report or application. This period may be extended by written request from the DWQ Director at any time.

I. Twenty-four Hour Notice of Noncompliance and Spill Reporting

1. The permittee shall verbally report any noncompliance, or spills subject to the provisions of UCA 19-5-114, which may endanger public health or the environment as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of the circumstances. The report shall be made to the *Utah Department of Environmental Quality 24 hour number, (801) 536-4123, AND to the Division of Water Quality, Ground Water Protection Section at (801) 536-4300, during normal business hours (8:00 am - 5:00 pm Mountain Time).*
2. A written submission shall also be provided to the DWQ Director within five days of the time that the permittee becomes aware of the circumstances. The written submission shall contain:
 - a. A description of the noncompliance and its cause. The period of noncompliance, including exact dates and times.
 - b. The estimated time noncompliance is expected to continue if it has not been corrected.
 - c. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
3. Reports shall be submitted to the addresses in Part II G, Reporting Requirements.

J. Other Noncompliance Reporting

Instances of noncompliance not required to be reported within 24 hours, shall be reported at the time that monitoring reports for Part II D are submitted.

K. Inspection and Entry

The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit.
2. Have access to and copy, during normal business hours, any records that must be kept under the conditions of this permit.
3. Inspect during normal business hours any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit.
4. Sample or monitor during normal business hours, for the purpose of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.

IV. COMPLIANCE RESPONSIBILITIES

A. **Duty to Comply**

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and re-issuance, or modification; or for denial of a permit renewal application. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

B. **Penalties for Violations of Permit Conditions**

The Act provides that any person who violates a permit condition implementing provisions of the Act is subject to a civil penalty not to exceed \$10,000 per day of such violation. Any person who willfully or negligently violates permit conditions is subject to a fine not exceeding \$25,000 per day of violation. Any person convicted under Section 19-5-115(2) of the Act a second time shall be punished by a fine not exceeding \$50,000 per day. Nothing in this permit shall be construed to relieve the permittee of the civil or criminal penalties for noncompliance.

C. **Need to Halt or Reduce Activity not a Defense**

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. **Duty to Mitigate**

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

E. **Proper Operation and Maintenance**

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

V. GENERAL REQUIREMENTS

A. **Planned Changes**

The permittee shall give both verbal and written notice to the Director prior to any planned physical alterations or additions to the permitted facility. Notice is required when the alteration or addition could significantly change the nature of the facility or increase the quantity of pollutants discharged.

B. **Anticipated Noncompliance**

The permittee shall give advance notice of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

C. **Permit Actions**

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and re-issuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

D. **Duty to Re-apply**

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a permit renewal or extension. The application should be submitted at least 180 days before the expiration date of this permit.

E. **Duty to Provide Information**

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

F. **Other Information**

When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Director, it shall promptly submit such facts or information.

G. **Signatory Requirements**

All applications, reports or information submitted to the Director shall be signed and certified.

1. All permit applications shall be signed as follows:

- a. For a corporation: by a responsible corporate officer.
- b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.
- c. For a municipality, State, Federal, or other public agency by either a principal executive officer or ranking elected official.

2. All reports required by the permit and other information requested by the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
 - a. The authorization is made in writing by a person described above and submitted to the Director.
 - b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)
3. Changes to Authorization
If an authorization under Part IV G 2. is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part IV G 2. must be submitted to the Director prior to or together with any reports, information, or applications to be signed by an authorized representative.
4. Certification
Any person signing a document under this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

H. Penalties for Falsification of Reports

The Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six months per violation, or by both.

I. Availability of Reports

Except for data determined to be confidential by the permittee, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Director. As required by the Act, permit applications, permits, effluent data, and ground water quality data shall not be considered confidential.

J. Property Rights

The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

K. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

L. Transfers

This permit may be automatically transferred to a new permittee if:

1. The current permittee notifies the Director at least 30 days in advance of the proposed transfer date.
2. The notice includes a written agreement between the existing and new permittee containing a specific date for transfer of permit responsibility, coverage, and liability between them.
3. The Director does not notify the existing permittee and the proposed new permittee of his or her intent to modify, or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph 2 above.

M. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, penalties established pursuant to any applicable state law or regulation under authority preserved by Section 19-5-117 of the Act.

N. Reopener Provision

This permit may be reopened and modified (following proper administrative procedures) to include the appropriate limitations and compliance schedule, if necessary, if one or more of the following events occurs:

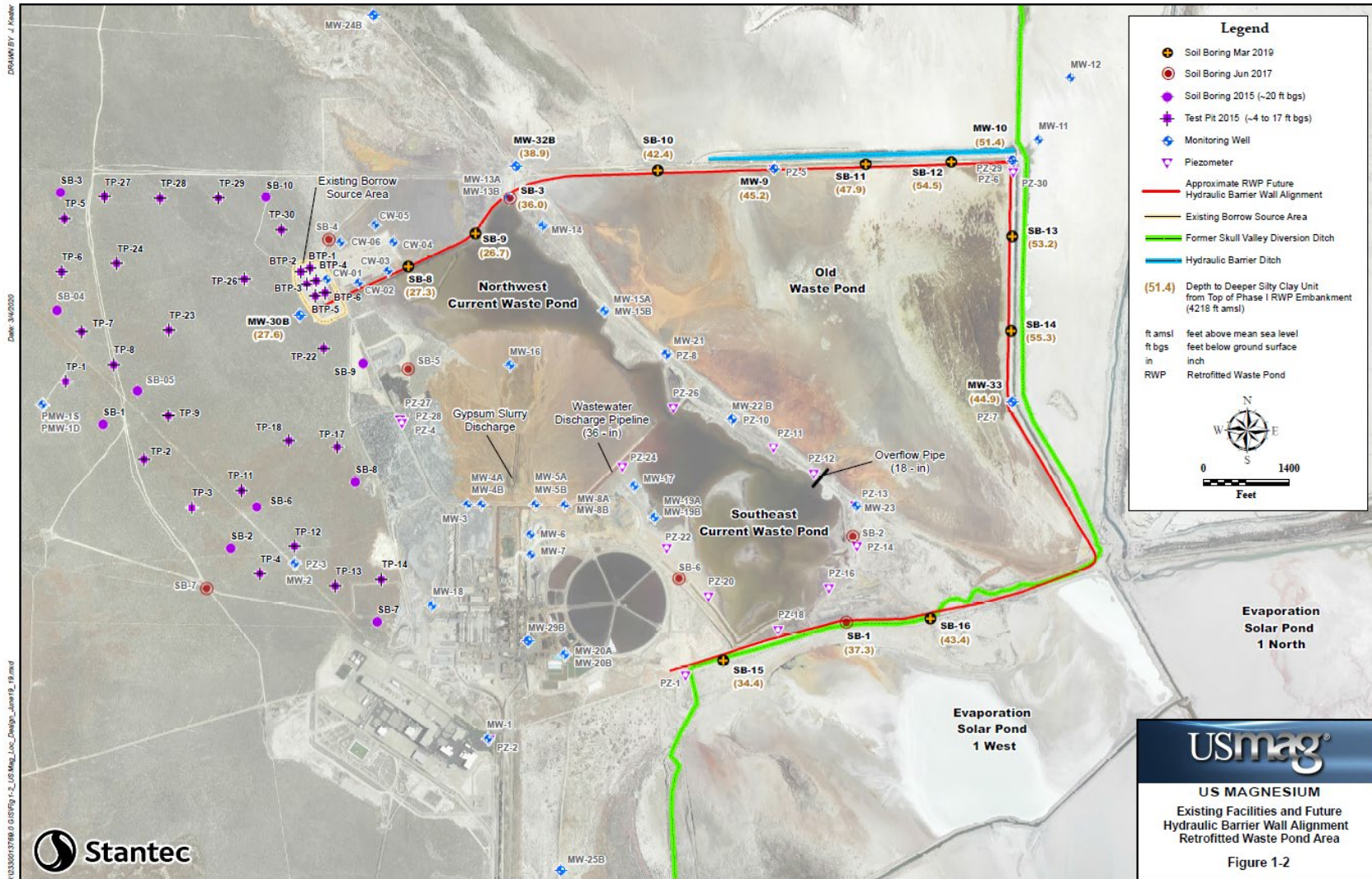
1. If new ground water standards are adopted by the Board, the permit may be

reopened and modified to extend the terms of the permit or to include pollutants covered by new standards. The permittee may apply for an alternate concentration limit under the conditions outlined in R317-6-6.4(D)

2. If alternate compliance mechanisms are required.
3. If water quality of the facility is significantly worse than represented in the original permit application.

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VI. Figure 1: Retrofitted Waste Pond Alignment of the Vertical Hydraulic Barrier Wall



From: Stantec. March 3, 2020. Retrofitted Waste Pond Phase 1 Basis of Design Report - US Magnesium Facility, Revision C. Figure 1-2.

VII. Appendix A: Inspection and Monitoring Plan

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VIII. Appendix B: Interim Compliance Monitoring Plan

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IX. Appendix C: Isotope Study Plan

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X. Appendix D: Phase 2 Design for the Retrofitted Waste Pond and Hydraulic Barrier Wall Construction Permit, Plans, and Specifications

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**XI. Appendix E: Consent Decree signed by US Magnesium and EPA dated
June 30, 2021**

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