Bowman

July 15, 2024

Beth A. Magee
Deputy Regional Permit Administrator
New York State Department of Environmental Conservation
232 Golf Course Road
Warrensburg, NY 12885

Corrie Magee
Environmental Program Specialist 1
Adirondack Park Agency
1133 NYS Route 86
Ray Brook, NY 12977

RE: Barton Mines Company, LLC
Ruby Mountain Garnet Mine
Major Permit Modification
NYSDEC Mine Permit #5-5230-00002/00002 (Mine File #50483)
APA Permit #: P79-140, P70-356, P87-39, P87-39A, P87-39B, P88-393, P88-393A

Dear Beth and Corrie:

On behalf of Barton Mines Company, LLC (Barton), Bowman Consulting Group (Bowman) has prepared this document in response to comments from the New York State Department of Environmental Conservation (NYSDEC) and the Adirondack Park Agency (APA) associated with the permit modification application referenced above.

At the outset, Barton wishes to address the comment in the APA's Notice of Incomplete Permit Application (NIPA) suggesting that the agency might consider permitting only Phase 1 of the project, and not the four-phased, 67-year life of mine (LOM) set forth in the permit modification application. To be clear, this application is for the full four phase implementation of the LOM as proposed.

Barton performed a legal analysis of the permitting authority and practices of both the APA and the NYSDEC. For the reasons summarized here and more fully explained in Appendix Y to the Permit Narrative, Barton respectfully maintains that (1) full LOM review (as requested in and supported by Barton's submissions) is required, and (2) segmenting Phase 1 of this project from the remaining three phases is much less environmentally protective than full LOM review and contrary to law.

More specifically, the NYSDEC has primary jurisdiction over extractive mining in New York State under the Mined Land Reclamation Law (MLRL), which supersedes state and local laws that regulate mining or reclamation. As mandated by the MLRL and as contemplated by the New York State Environmental Quality Review Act, the NYSDEC requires full LOM review, evaluating the project for the full duration and issuing permits typically for a five-year term, subject to periodic renewals per regulatory standards over the entire LOM. In the past, the APA likewise has followed this approach, evaluating multi-phase, long-term projects for the entire LOM and issuing permits whose durations align with the NYSDEC permit terms, subject to periodic renewal (over the entire LOM).

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Notably, this approach has significant environmental benefits. As a general matter, comprehensive impact evaluation for the project's full life allows the project sponsor and regulators to select project plans and strategies that best avoid and/or mitigate adverse impacts. Here, that is certainly the case. The proposed four-phased sequencing over the 67-year LOM allows for concurrent mining and reclamation, thereby significantly reducing impacts related to residual minerals (RM) storage. If only Phase 1 were being considered, Barton would need to wholly revise its mining plan which our analysis of alternatives shows would be less protective of the environment and more disruptive to neighbors than the four-phase LOM Plan proposed here. Consequently, the four-phased, 67-year plan presented in the permit modification application is the best-case scenario to minimize environmental impacts and is, thus, properly before the APA. In accord with Barton's position regarding full LOM review, Barton thus has applied the APA's NIPA comments to all four phases of the proposed project. To that end, as reflected in Barton's supporting analyses, Barton has identified and evaluated all potential impacts from all four phases of this project for the full 67-year LOM and responds herein to the APA's comments/questions accordingly.

No material technical changes have been made to the proposed permit modification application documents since the last submission. Barton has added three additional appendices as outlined below:

Appendix W: Barton has been an involved and engaged member of the Johnsburg/Indian Lake community for more than a century. In keeping with the company's enduring commitment to maintaining an open dialogue with other community members on matters of mutual interest, Barton has proactively informed the community of its permit modification request and invited public input since beginning the permit modification process in 2021. This outreach includes three public presentations, including a project information meeting attended by more than 70 community members; more than 20 project briefings to neighbors, community organizations, individual community leaders, and news media organizations; and two community mailings to more than 4,000 local property owners. A detailed listing of all community outreach efforts can be found in Appendix W.

Appendix X: Barton has included a proposed monitoring plan that details the commitment to long-term monitoring for the duration of the LOM.

Appendix Y: Barton has included a legal analysis of the permitting authority and practices of the NYS DEC and APA relative to LOM review.

H2H Geoscience Engineering, LLC (H2H) has been acquired by Bowman. Documents, reports, letters, figures and drawings created before the acquisition maintain H2H in the title or title block. Documents, reports, letters, figures and drawings created after the acquisition include Bowman in the title or title block. Engineering reports that require certification by a NYS licensed professional engineer are submitted under the DBA Bowman Consulting, Engineering, Land Surveying and Landscape Architecture Company and has NYS registration under Omland Engineering Associates, Inc. (Geotech and Sound Study).

The West Firm, PLLC is now a member of the Barton technical and legal teams providing support to the project through the final stages of the permitting process.

Please find below the NYSDEC/APA comments in bold font text and the H2H response in italics.

NYSDEC Comment and Response

1.) **Narrative: The symbol on several of the figures indicating vegetation to remain is not visible on portions of the northern life of mine (LOM) boundary. Please state that vegetation outside the LOM boundary within the Barton property line will remain in place throughout the life of the mine.**

Response: The symbol has been updated in the plans and figures. Barton confirms, and has added the statement, "All vegetation outside the LOM boundary and within the Barton property line will remain in place throughout the life of mine," to the relevant plans, figures, and text.

2.) **Groundwater: The response to item number 13 and 14 of the letter states that well locations have been included on the cross-sections. Please provide these updated cross sections. The response to item number 13 and 14 of the letter states that well locations have been included on the cross-sections. Please provide these updated cross sections. The groundwater elevation provided on the cross sections is 1700 feet AMSL throughout the entire site. Is this an accurate representation of the groundwater elevation provided by monitoring wells? Monitoring location RUB-1 indicates a groundwater elevation of 1982 feet, monitoring location RUB-6 indicates a groundwater elevation of 2,023ft, RUB-2 shows groundwater at elevation 2,104ft. The groundwater elevation indicated on the cross sections should reflect the groundwater elevation indicated by the map on page 10 of the narrative and the well data.**

Response: The cross sections have been updated as requested. All groundwater elevation information presented on the updated cross sections has been validated.

3.) **Groundwater: Wells RUB 1,2,4,5 and 6 may be mined through as proposed mining progresses. Please address. Will these wells be replaced? What wells will remain throughout the life of the mine for continuous monitoring?**

Response: Barton commits to relocating the monitoring wells to adjacent locations prior to mining through these areas. Monitoring wells will be relocated to areas where either mining has reached final grade or where no mining is proposed. The depths of the relocated monitoring wells will extend below the bottom of the proposed adjacent excavation depth.

Prior to removing a well within the monitoring network, Barton will coordinate with the agencies to site the new well location and depths. This will ensure that all groundwater conditions will be appropriately monitored as the mineral extraction operation expands either laterally or vertically.

4.) **Groundwater: Please provide tables with the updated depth-to-water data and associated hydrographs for all the wells in the network.**

Response: Updated water levels tables and hydrographs have been prepared and are included in the updated permit narrative.

5.) **Reclamation: Please discuss how the RM Pile will drain after final reclamation. If the current/proposed under drains of the tailings pile drain into basin three or basin 2, and**

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currently the water in those basins is used in a closed loop system to be reprocessed through the mill, discuss the RM Pile drainage for when those basins are no longer drawn from and are subsequently reclaimed as grassland.

Response: The top of the RM Facility will be graded to provide positive drainage and avoid ponding. Stormwater will be directed towards existing stormwater drainage ditches that encompass the perimeter of the RM Facility. The perimeter stormwater ditches will drain to the previously decommissioned sediment basin locations identified in the Stormwater Pollution Prevention Plan (SWPPP) documents (Appendix G).

Any water collected within the under-drain system will discharge to both basin 2 and basin 3 during the RM Facility development. The sources of water that would make its way into the under-drain system are precipitation and process water (pumped from the mill and gravity-drained into the upper pond). At the end of the operation, process water will no longer be pumped into the upper pond, and only infiltration from precipitation events (attenuated by reclamation vegetation) will reach the under-drain system. Under-drains have been designed to discharge into basin 2 and basin 3. During final reclamation, these basins will be decommissioned and reclaimed, and discharge waters will be directed to adjacent surface water features.

6.) **Reclamation: Phase 4 Reclamation Plan Map: The Phase four reclamation plan map indicates areas such as basins and building locations not within the reclamation/revegetation area. Please include these areas as to be reclaimed during this phase. All areas affected by mining must be reclaimed at the time of final reclamation. Please provide an acreage summary on this map indicating acreages of areas to be reclaimed with various plantings. Does the permittee intend to plant trees throughout the entire site and on the high wall benches? Please label and provide an acreage summary for areas where vegetation is to remain int place within the LOM area on the phase 4 reclamation plan map. It may be helpful to discuss acreages with the DEC prior to submission.**

Response: Barton is proposing to plant the tree species identified within the revised reclamation plan for both accessible quarry highwall benches and the RM Facility final grades. The requested areas and acreages have been included in the reclamation plan legend. As reflected in the Visual Impact Assessment, potential adverse visual impacts will be mitigated through concurrent reclamation and vegetative planting activities.

7.) **Noise: Change in Methodology:**

a) **The November 2023 Sound Study utilizes a different methodology than the prior two sound studies that were submitted to regulatory agencies for this project. Specifically, the prior two sound studies used the straight-line projection method. The current November 2023 sound study utilizes "industry standard software modeling program dBMap, which is International Standards Organization -compliant (ISO 9613 1,2,3). The dBMap modeling tool is a more comprehensive sound propagation analysis method than the previously straight-line projection method and accounts for surface reflection and absorption, atmospheric absorption, geometric divergence, weather conditions,**

topography, source sound power level, and additive effects of all on-site sources." The paragraph further states "The straight-line projecting method used previously is more conservative and subsequently yields high projected sound levels than those projected from the dBMap software, which more accurately reflects sound attenuation resulting from the site conditions mentioned above." Section 3.6.1 Methodology provides additional details that include "assumed downwind propagation (wind direction within an arc of 90 degrees with the wind blowing form the source at 11 M.P.H.), and ground-based temperature inversion. A ground factor of 0.7 is used to be conservative. Sound pressure levels are A-weighted and shown in the form of isolines in 5 dB intervals from 25 dB(A). Modeled sound levels at each monitoring location are labeled; each received is modeled 5 feet above ground surface." The model output provides modeled sound pressure levels across the site under the eight modeled scenarios utilizing the Sound Power Levels of different operations taking place at the site (Table 19). The maps (Figures 3 to 10) show the sound propagation in 5dB intervals. Sections 3.6.3.1 through 3.6.3.4 provide the sound pressure level from each scenario in table format at the monitoring locations including modeled Sound Pressure Levels and rise over ambient. However, few details are provided regarding the model inputs, assumptions and constraints, e.g., Temperature, Humidity, barrier attenuation parameters, reflection details, isoline and map outputs. The model also includes aspects not typically seen in sounds studies submitted to DEC for Mined Land Reclamation permit applications or modification, e.g., surface reflection and absorption, atmospheric absorption, geometric divergence and weather conditions. It might be helpful to discuss input variables with the regulatory agencies prior to using in the model.

Response: Barton has added discussion of the variables indicated above to the Sound Study, Appendix P. In addition, Barton has met with NYSDEC staff to discuss the use of these variables as they relate to NYSDEC guidance (NYSDEC Program Policy DEP-00-1) recommending the use of modeling for second level noise impact evaluations.

b) **It is unclear from the sound pressure level maps (and tables) which model input features or constraints are affecting attenuation at certain monitoring locations, i.e., how much is attributable to distance attenuation, barrier, etc. Furthermore, the use of specific model input values (e.g., temperature, humidity, and ground factor) likely only generated output for the eight scenarios under specific seasonal conditions that are not necessarily the same during other times of the year, i.e., winter versus summer. Please provide detailed receiver output calculations along with other model output to allow for a detailed review and understanding of the model.**

Response: Output from the sound model includes information detailing the amount of attenuation associated with distance and topographic barriers and has been provided for review in the updated Sound Study, Appendix P. Barton has added a discussion regarding the impact of seasonal variations in temperature, humidity and ground condition factors to the updated Sound Study.

c) **It is unclear what the accuracy of the model is given the number of input values, assumptions and limitations. As stated in Section 1. Executive Summary, paragraph four**

(page 1), this method [dBMap] is less conservative than the straight-line projection method. DEC generally prefers the straight-line projection method as it is (i) readily replicable and (ii) conservative as it typically limits attenuations to distance and barrier, and occasionally some vegetation.

Response: Sound modeling through the dBMap program provides a higher degree of accuracy in projected sound levels given the inclusion of multiple sound sources and attenuation factors identified above. The model is conservative given the assumption that multiple sound sources are operating at one time which will never occur during normal or developmental operations. Barton has provided a side-by-side comparison of results from the dBMap program and straight-line projection methods for a representative cross section as a sensitivity analysis so that the NYSDEC can evaluate the differences between the two methods and evaluate impacts of the proposed project.

8.) Noise - Ambient: The current model utilizes the 2023 measured ambient sound levels to determine future sound levels at the various monitoring locations under the eight modeled scenarios. However, as noted below, the 2023 ambient sound levels are generally higher than those used in 2022 sound study and therefore, the resultant modeled sound levels show a lesser riser over ambient compared to earlier studies and provide a more favorable outcome.

a) Section 3.3, Monitoring Location Sound Levels and Table 5 provides updated ambient sound level readings (mill and quarry not in operation) taken during August 17, 2023 and August 18, 2023. However, for M-6a (Brown Pond) only readings were taken on August 17, 2023. Please explain why no readings were taking on August 19, 2023, as the lowest ambient sound level between the two readings (August 17 and August 19) was used in the sound study for all other locations.

Response: The data from the sound recording unit at M-6a was corrupted due to faulty cabling and could not be recovered for the day of August 19th.

b) Location M-6 and M-6a: M-6 was relocated to M-6a to be more representative of the wilderness area. However, currently no monitoring or receptor location exist to the west of the RM Pile. Please consider including M-6 as a western reference point.

Response: M-6 has been included in the Sound Study as a western reference point as requested.

c) Measured Sound Levels, Tables 4 and 5: The August 17, 2023 and August 19, 2023 ambient sound level readings were taken when the mill and quarry was not in operation as requested by regulatory agencies and provided in Table 5. Table 4 provides the ambient and operating sound levels from 2022. Section, 1.0 Executive Summary, 6th paragraph provides "The results of the August 2023 sound recordings demonstrate no correlation between mill operations and mill not operating at the monitoring locations. [….] The variations in environmental sources were far more significant factor in the ambient levels than sound generated from the mill across both the 2022 and 2023 studies." Given the statement in Section 1 and considering the lowest sound level readings at the various locations (see below table), please explain why the lowest sound

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levels measured between 2022 and 2023 for each location were not chosen as a conservative ambient sound level as it appears that the 2022 readings with the mill operating (or even the quarry and mill operating) resulted in lower sound levels when compared to the ambient readings in 2023. To be conservative, please provided an updated sounds study that uses the lowest sound levels measured at the monitoring locations.

Response: As requested, Barton has utilized the lowest ambient sound levels from all monitoring locations to assess impacts from sound projected from the site.

d) The table below shows the lowest reading for each location from 2022 and 2023 under the measured conditions, bold indicates lowest reading.

Monitoring Location	2022 - Lowest ambient (3:30 pm to 7:00 am), only mill in operations	2022 – Lowest operating (7:00 am to 3:30 pm), quarry and mill in operation	2023 – Lowest ambient (7:00 am to 3:30 pm), quarry and mill not in operation	2023 – Lowest ambient (3:30 pm to 7:00 am), quarry and mill not in operation
Usage:	Used as ambient in 2022 sound study.	Used as current approved operating sound levels in 2022.	Used as ambient in 2023 sound study to project sound levels experienced for proposed expansion modification.	Used as ambient in 2023 sound study for proposed expanded operating hour.
	dBA Leq	dBA Leq	dBA Leq	dBA Leq
M-3	**32.2**	34.9	45.2	45.0
M-4	51.3	**41.1**	48.4	47.4
M-5	**35.6**	41.0	36.6	35.7
M-6	**37.1**	43.2	--	--
M-6a	--	--	**44.1**	44.7
M-7	**40.5**	48.5	44.5	41.0
M-8	**42.0**	50.6	48.6	45.1
M-9	**33.8**	39.3	40.7	37.9

Response: For context the following is a list of everyday sound sources:

- *Standard refrigerator @ three feet 45 dB(A)*
- *Quite library 35 dB(A)*
- *Soft whisper @ 15 feet 35 dB(A)*

Barton Property Boundary Monitoring Locations – M-3, M-4, M-5, and M-6

Public Monitoring Locations – M-7, M-8, and M-9

Wilderness Monitoring Locations – M-6a

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9.) **Noise: Section 3.5.3 Sound Power Level: This section provides Table 7 Operation Sound Power Levels for the different aspects of the operation. Sound Power Levels are used in the dBMap Model. Please also include in the table the recorded Sound Pressure Level, ground condition and distance used to calculate the sound power levels as provided in "The recorded sound pressure levels, ground conditions, and the distance from the operating equipment were used to calculate the sound power level of each operation taking place on site (Table 6)". Please also include the formula to convert sound pressure level to sound power level.**

Response: The requested table and formula have been provided in the revised Sound Study located in Appendix P.

10.) **Noise: Page 85 of the narrative states, Under worst case operating conditions, the highest projected increase in sound levels will occur at receptor M-5 near the end of Phase 1, for a period of less than two weeks, when a portion of the upper highwall is stepped back to accommodate mining. A worst case sound level increase will never last more than 2-3 weeks for a given occurrence (Table 5). This rise over ambient is 6.5 db. Is there any additional sound dampening that can be done during this worst case scenario to mitigate noise impacts during this time frame?**

Response: The worst case rise over ambient is 8.1 dB(A) at M-5 not 6.5 dB(A) (Table 5). The highest modeled sound level at M-5 is 44.7 dB(A). Sound levels from 40-50 dB(A) are perceived by humans as quiet to very quiet. In addition, M-5 is on Barton's property, and development activities will occur for approximately two weeks during each phase of the project.

Barton is committed to reducing the number of simultaneously operating mobile equipment to limit the additive effect of sound during development and operational conditions. Barton implements an engineering review process during the acquisition of mobile equipment and requisition of subcontractors. This process includes the review of sound generation from mobile equipment. Barton is very aware of the sensitive nature of sound generation from the facility and is always seeking better technology to reduce sound levels leaving the property.

11.) **Noise: Section 3.7 Modification of Operating Hours: This section describes the approach taken to determine modeled sound levels at monitoring locations M-3 to M-9 for the additional one hour from 3:30 pm to 4:30 pm (summarized in Table 19). It is DEC's understanding that for each monitoring location (i) the 1-hour (in Leq 1-sec interval) from 3:30 to 4:30 PM (ambient 2023) and (ii) the worst-case sound projection from the four scenarios (Tables 7, 10, 13 and 16) were used to model ambient sound levels for the proposed additional hour of operation (Modeled Ambient in Table 19). The output was then compared to the ambient (2023) sound levels. Please provide the min., max., and dB(A) Leq for each location for the hour from 3:30 pm to 4:30 pm. Also, should the ambient for the additional hour (3:30 to 4:30 pm) be used rather than the Leq from 3:30 pm to 7:00 am). Please use the lowest ambient (3:30 pm to 4:30 pm or 3:30 pm to 7:00 pm) to be conservative.**

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Response: *Barton has modified the Sound Study to include the minimum, maximum, and dB(A) Leq for each location for the hour from 3:30 pm to 4:30 pm. The lowest recorded Leq from 3:30 pm to 4:30 pm or 3:30 pm to 7:00 am was utilized in the revised Sound Study.*

12.) Geotechnical Engineer Letter of Certification: Is the RM pile currently monitored for slope stability? Please implement the use of slope inclinometers which measure any subsurface deformation to ensure that the embankments are indeed stable.

Response: *Yes, the RM Facility is currently monitored for slope stability through daily observation, annual fly-over topographic dataset comparisons, vibrating wire piezometer data, and site visits from the geotechnical engineer on a regularly scheduled basis.*

Barton will install two inclinometers and four additional vibrating wire piezometers in the vicinity of the middle pond and at the locations identified in Figure 1 located in Appendix T. As the RM Facility expansion continues, Barton will add casing extensions to or relocate instrumentation based on the recommendations of the NYS licensed professional engineer and inform the NYSDEC of these changes prior to implementation. During Phase 3 when the RM Facility elevation increases, Barton will add piezometers and an inclinometer within the upper pond to monitor pore water pressures and stability along cross section D.

Barton has developed a monitoring plan that details Barton's commitment to long-term monitoring of the RM Facility stability and groundwater. (Appendix X).

13.) Geotechnical Engineer Letter of Certification: Does Barton agree to submit reports completed by a qualified geotechnical engineer and complete periodic evaluations of existing conditions to confirm that the assumptions utilized in the letter remain consistent with actual field behavior and to provide ongoing geotechnical guidance? Does Barton agree to implement continual planning, evaluation, design adjustments, and proper implementation of all recommendations included in the geotechnical analyses?

Response: *Barton has developed a monitoring plan, included in Appendix X, that outlines its commitment to monitoring the stability of the RM Facility for the entire LOM. The plan includes the following elements: cross-section geometric analysis, continuous piezometric readings, inclinometer installation and readings, factor of safety analysis updates, and annual reporting. Barton is proposing to provide annual reports summarizing the data collection and analysis detailed in the document for the first five years of operation post permit approval. Barton is proposing to decrease the frequency of annual reporting to every five years after the first five years to coincide with the NYSDEC's permit renewal timeframe.*

Barton agrees to continue implementing planning, evaluation, design adjustments, and all recommendations included in the geotechnical analyses for all four phases.

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14.)Geotechnical Engineer Letter of Certification: Does Barton agree to construct under drainage in key areas including lateral and downslope finger drains to aid the drainage of water from the sand portion of the pile?

Response: Yes, Barton agrees to continue the construction of underdrains for all locations of the RM Facility expansion and agrees to comply with the NYS licensed professional engineer's specifications.

15.)Geotechnical Engineer Letter of Certification: Does Barton agree to modify Proctor testing needed to verify minimum dry density? Please provide specifications for the modified Proctor testing (spacing/frequency).

Response: Barton has historically implemented density testing for all required compaction layer expansion areas and will continue this practice in the future. Modified Proctor testing will be performed at a minimum frequency of one test per 100-foot x 100-foot grid within the layer. The limits of the constructed compaction layer and location of the density test shall be surveyed and presented in the compaction layer test report. Density testing of the compaction layer has been included in the proposed monitoring plan located in Appendix X.

16.)Geotechnical Engineer Letter of Certification: The letter response to #2 states, If the results indicate that modifications to the design or operation of the facility are required to meet design intent going forward, the assumption is that the modifications would be made within the confines of the proposed permit boundaries. Will Barton provide for engineering approval of ongoing design work, even if the revisions remain within the permitted footprint and maximum height of the proposed file? The design work and engineering approval should be submitted to the department for review. Changes in design should not be implemented until DEC provides written acknowledgement of receipt and review of the revision. The QA/QC that would be conducted for the final design should be provided in the narrative with generic discussion of what will be required prior to the engineering approval. If significant construction induced pore pressures are indicated by future instrumentation, RM sand placement may need to be slowed or redirected to allow pore pressures to dissipate in the slimes, or additional analysis will be required to confirm adequate stability is maintained. Does Barton agree to this stipulation? Does Barton agree to cease placement of residual minerals on the pile if the geotechnical analysis indicates instability or that the conditions assumed in the Knight Piesold report are no longer representative of field conditions until the issues have been reevaluated and resolved?

Response: Barton has followed and agrees to follow all recommendations for design modifications recommended by the NYS licensed professional engineer and to provide those recommendations to the NYSDEC prior to implementing any changes to the development of the RM Facility even if the recommendations are within the envelope of the existing design.

17.)Geotechnical Engineer Letter of Certification: The geotechnical analysis mentions a site investigation and piezometer installation program within the middle pond slimes expected to take place in 2023. Was this conducted? Please provide specifications for the vibrating wire piezometers (number of units, location, spacing, depth). If this was not done, does Barton agree to install vibrating wire piezometers into the slimes to confirm that no

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significant load induced pore pressures develop when RM are to be placed over existing slimes? If so, when will this be conducted?

Response: The additional drilling, sample collection, laboratory analysis, and piezometer installation planned for 2023 will occur in the summer of 2024. During this mobilization, piezometers will be installed in both fine- and coarse-grained RM and at depths determined from stratigraphic information collected during the investigation.

Barton has developed a monitoring program for the RM Facility located in Appendix X that includes continuous monitoring of all site piezometers, review of and interpretation of data by a NYS licensed professional engineer and annual reporting of results to the NYSDEC and APA.

18.) Geotechnical Engineer Letter of Certification: Was the geotechnical report stamped by a PE who can practice in New York State? The reports filed should include a certification/statement by the qualified geotechnical engineer that the data has been reviewed and remains consistent with the assumption in the letter.

Response: Bowman (NYS licensed professional engineer) has performed a review of existing data and documents and conducted slope stability analyses for the proposed Residual Mineral Storage Facility (RM Facility) at Barton's Ruby Mountain Site in support of the major permit modification application through the NYSDEC and the APA. Bowman has also developed a proposed monitoring plan to monitor the growth of the RM Facility during lateral and vertical expansion activities over the life of the operation. See Appendix X.

Knight-Piesold has been the geotechnical consultant for the Barton RM Facility for more than a decade and has developed multiple reports on material properties, exploratory drilling, instrumentation installation, pore-water conditions, RM Facility stability, and RM Facility development. Bowman reviewed the reports and developed the phased design associated with the proposed permit modification in conjunction with Knight-Piesold. Bowman and Knight-Piesold collectively participated in the design process with coordination meetings and technical review of all aspects of the design. Bowman utilized data and information from the reports listed above to perform a cross check of existing facility composition, material properties, and slope stability analysis methodology detailed in this report. Initial designs were completed by NYS licensed professional engineers from SRK consulting in 1995.

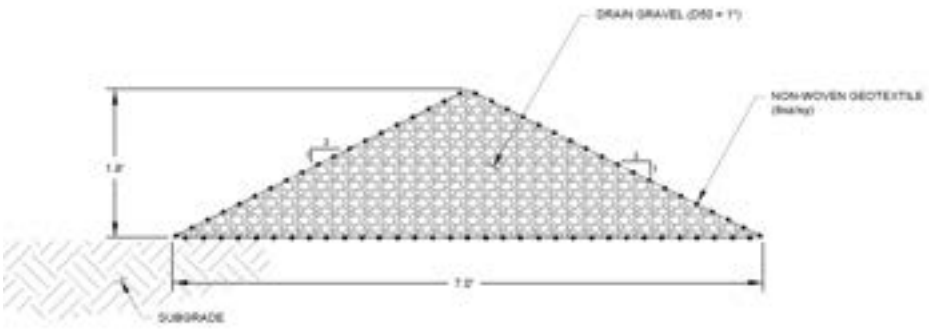
19.) Geotechnical Engineer Letter of Certification: Please provide additional details concerning how poor pressures will be monitored during construction. How frequently will piezometers be downloaded, who will be reviewing the data, what poor pressure is significant (what is the trigger), what action will be taken? Will the DEC be notified of the significant poor pressure when it is detected, and the remedial action be taken?

Response: As previously discussed, Barton has developed a monitoring plan for the RM Facility that includes continuous monitoring of all installed piezometers. See Appendix X. The data will be accessible by Barton personnel and a NYS licensed professional engineer. The engineer will be responsible for reviewing and interpreting the data, and, if any readings are of concern, the engineer

will inform Barton and recommend remedial measures that may include the cessation or slowing of RM placement. Barton will inform the NYSDEC and APA of any such occurrences. In accordance with the proposed monitoring plan, all piezometer data will be provided to the NYSDEC and APA in an annual report.

20.) Geotechnical Engineer Letter of Certification: Please provide specifications for the under drains including design drawings, spacing, diameter, discharge locations, discussion of handling of discharge water, discussion of drainage following final reclamation, etc..

Response: Any water collected within the under-drain system will discharge to both basin 2 and basin 3 during the RM Facility development. The design details for the under-drain system are presented below. The sources of water that would make their way into the under-drain system are precipitation and process water (pumped from the mill and gravity-drained into the upper pond). At the end of the operation, process water will no longer be pumped into the upper pond, and only infiltration from precipitation events (attenuated by growing vegetation) will reach the under-drain system. Under-drains have been designed to discharge into basin 2 and basin 3. During final reclamation, these basins will be decommissioned and reclaimed, and discharge waters will be directed to adjacent surface water features.



21.) Geotechnical Engineer Letter of Certification: Please provide for regular visual inspection of the pile, with the process for documenting the inspection, issues identified, and remedial actions taken. The documentation should be included in the geotechnical reports.

Response: Barton has historically performed visual inspection of the RM Facility and commits to continue this practice. Barton will perform daily visual inspections and develop monthly reporting that documents any issues that may have been observed and any remedial actions taken. Visual inspections and the subsequent reporting are included in the proposed monitoring plan located in Appendix X. These inspection reports will be submitted along with the proposed annual reporting of all RM Facility monitoring requirements.

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22.)Geotechnical Engineer Letter of Certification: Please include a closure plan with the geotechnical analysis including all anticipated and potential erosion and infiltration controls.

Response: All erosion and sediment control measures for the proposed RM facility are identified on the SWPPP documents located in Appendix G.

23.)Geotechnical Engineer Letter of Certification: Please address how changes in precipitation due to climate change and the potential impacts on surface erosion and slope stability may impact the RM pile.

Response: Stormwater modeling has been performed for the RM Facility that includes precipitation increases based on long-term climate change projections. All drainage features that will remain post reclamation have sufficient capacity to handle projected increases in precipitation. Vegetative cover established during reclamation and elimination of process water pumping to the RM Facility will significantly reduce the quantity of water expected to infiltrate within the RM Facility. Therefore, stability of the RM Facility due to porewater pressure increase is not a long-term concern for the RM Facility

24.)SWPPP: Given the recent flooding event on Monday, December 18, 2023, the SWPPP must be revised to provide an item-by-item evaluation that considers opportunities to implement the enhanced Best Management Practices (BMPs) as outlined in Part II.D.9 of the SPDES Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (MSGP GP-0-23-001).

Response: The SWPPP has been revised to include discussion of Enhanced BMPS in Part.II.D.9 of the MSGP GP-0-23-001 (See section 7.3 of the SWPPP). Starting with GP-0-23-001, the NYSDEC has identified a series of enhanced BMPs to reduce the impact of increasing climate risks due to major storm events, flood events, sea level rise, storm surge and seiche. The measures included are discussed below:

For the majority of the site, flood risk is minimal. The site is elevated significantly above major waterbodies and adjacent streams/wetlands. Brown Pond Brook, which flows through the center of the site, is generally located in a deep valley +/-20' the existing roadway, mitigating flood risk. There is one stream crossing on-site, where road elevation is +/- 10' above the streambed.

Any piled materials stored on-site, the RM Facility, and raw materials stored near the mill are stored at an elevation that negates any projected flooding. Additionally, materials behind the mill are surrounded by a berm. Contained materials, including chemicals, compressed gases, and petroleum products, are stored in a secure manner in the mill and crusher building to prevent any releases to the environment. All equipment, company vehicles and other semi-stationary structures are stored at elevations that will prevent the possibility of floating in flood scenarios when not in use.

Staff on-site are trained regularly in emergency procedures in case of extreme storm or flooding events. Raw material delivery will be delayed in the event a major storm event is expected to occur within 48 hours of delivery.

25.) **SWPPP: The Community Risk and Resiliency Act (CRRA) CRRA requires the applicant to demonstrate that they have considered future climate risk. The resubmission does not indicate that the applicant gave full consideration of future climate risks. Please provide specific information that indicates that flood risk has been considered, including discussion of designated flood zones, site elevations, past flooding or stormwater events that caused damage to stormwater control features or resulted in non-compliant discharges, future flood risks and climate risk mitigation measures or BMPs that were considered for implementation at the site. Please demonstrate that projected changes in temperature and precipitation were considered, utilizing the Observed and Projected Climate Change in New York document. Please identify any aspect of the operation of the mine or the reclamation that could be impacted by higher temperatures or precipitation rates and provide discussion of mitigation measures or BMPs considered for implementation at the site, including potential adaptation strategies for the planned reclamation (e.g. more resilient plantings, gentle grading, use of slope breaks, etc).**

Response: A section regarding the design considerations taken based on the CRRA and the effects of future climate risk on the long term operations at the site has been added to the SWPPP (See Section 3.3.1)

It can be summarized that the recent flooding event referenced above was associated with an undersized culvert at a stream crossing. The project to replace this culvert with an appropriately sized 3-sided box culvert is underway. Sizing for the box culvert will incorporate projected increases to the magnitude of storm events as discussed in the Observed and Projected Climate Change in New York document. Following the replacement of this culvert, the site will not be at risk for flooding. In the last published FIRM map for the area, the site was designated Zone C "area of minimal flooding" with the projected 100-year flood plan "Zone A" being limited to the area immediately adjacent to Thirteenth Brook along Thirteenth Lake Rd. There is a 300'+ difference in elevation between this flood zone and the lowest point of the quarry.

The stormwater design submitted for the permit resubmission was performed using projected IDF curves referenced in the Observed and Projected Climate Change in New York document. Based on the timeframe of the project, the selected IDF curves were for the 2070-2099 period, using the mid RCP 4.5 scenario. Using the higher rainfall totals obtained by these projections, the performance of the stormwater design remained unchanged. The Sediment basins at the RM Facility still produced no discharge in the 10-yr storm event and reached a maximum water elevation between the top of the riser pipe and emergency spillway in the 100-yr storm event.

To increase storage capacity in existing ponds on-site, those which discharge directly to Frog Pond and Little Crusher Pond will be retrofitted with a perforated riser pipe outlet structure, additionally Little Crusher Pond will be increased in size. This will increase detention times during storm events and help to ensure compliant discharges and controlled releases as storm events become more frequent in the coming years. As mining progresses through the proposed permit modification, the quarry area will drain internally reducing peak runoff rates for the site despite the increase in intensity of storms.

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APA Comment and Response

1.) **Please ensure that when any edits made to any plans, maps, or figures as a result of this 3rd NIPA, that all documents are updated to indicate the most recent revision date. Please also ensure that any future submissions to the Agency are consistent and accurate across all materials.**

Response: The requested revisions have been made, and the documents submitted in this response to the 3rd NIPA are up to date.

2.) **Appendix T, the geotechnical report titled "Barton Mine, Residual Minerals Storage Facility, Geotechnical Assessment of Proposed Permit Modification, REV4, Supersedes Prior Letter Dated October 13, 2023" and dated October 30, 2023 (the Geotechnical Report), is prepared by a Colorado engineering firm called Knight Piesold Consulting, but there are no signatures. Please submit a revised geotechnical engineering letter of certification that includes signatures and a cover sheet with the seal of a NYS licensed professional engineer.**

The Geotechnical Report states that "A site investigation and piezometer installation program within the Middle Pond slimes is expected to take place in 2023." Please explain if this investigation has commenced and, if so, please provide a preliminary report of the findings.

Response: An additional document has been prepared by Bowman reviewing the laboratory analysis, stability analysis and recommendations for the RM Facility construction for all four phases of development. The report certifies that the RM Facility as designed meets or exceeds a satisfactory factor of safety for all four phases of the operation. A cover sheet with the seal of a NYS licensed professional engineer has been provided. A monitoring program has been developed and attached in Appendix X that details proposed stability monitoring activities for the RM Facility and proposed reporting time frames to the NYSDEC and APA.

The middle pond borings program and piezometer installation are currently underway and expected to be completed during the summer of 2024.

The NIPA response letter received by the Agency on December 8, 2023, states that "Barton proposes to have a qualified geotechnical engineer conduct geotechnical assessments and file associated reports at least every five years." Please note that any Agency permit for the current proposal will likely require that geotechnical assessments and monitoring reports be performed and sealed by a NYS licensed professional engineer on an annual basis. The October 30, 2023, Geotechnical Report contains multiple assumptions, caveats, and contingencies in relation to activities contemplated in Phases 2-4, in particular the RM pile height expansion on top of the Middle Pond former slimes disposal area. The annual geotechnical assessments and monitoring reports performed during implementation of Phase 1 will document conditions resulting from the lateral expansion of the RM pile, and will help to eliminate the assumptions, caveats, and contingencies currently associated with

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Phases 2 through 4, potentially leading to a change in the proposal and/or allowing for a thorough Agency review of these phases.

Response: Knight-Piesold is a world-renowned geotechnical engineering firm with extensive experience in the design and management of RM facilities; however, it does not have certification in the State of New York. Knight-Piesold has been the geotechnical consultant for the Barton RM Facility for more than a decade and has developed multiple reports on material properties, exploratory drilling, instrumentation installation, pore-water conditions, RM Facility stability, and RM Facility development.

Bowman developed the phased design associated with the proposed permit modification in conjunction with Knight-Piesold. Bowman and Knight-Piesold collectively participated in the design process with coordination meetings and technical review of all aspects of the design. Bowman utilized data and information from Knight-Piesold to perform a cross check of existing RM Facility composition, material properties, and slope stability analysis methodology. The report certifies that the RM Facility as designed meets or exceeds a satisfactory factor of safety for the life of the operation. A cover sheet with the seal of a NYS licensed professional engineer has been provided.

Barton agrees to provide the APA with annual RM Facility monitoring reports as outlined in the proposed monitoring plan located in Appendix X. Inclinometer readings, piezometer readings, topographic cross-sections, observation reports with photographs and descriptions, discussion on quantities of material placement, and discussion on construction methods and practices during the year will be provided. All data and figures provided will include previous readings or observations for comparison and identification of movement as well as a detailed discussion. Validation of mine planning assumptions will occur during the annual reporting period.

Barton is proposing to provide annual reporting for the first five years of operation post permit approval, and then decrease the frequency to every five years.

3.) Please provide a reclamation plan for Phase 1 that allows for concurrent reclamation and ensures reclamation of areas disturbed during the proposed permit term.

Response: Concurrent reclamation is proposed for all four phases of the proposed life of the operation where excavation or RM Facility final grades have been met. However, final grades within the RM Facility and excavation area will not be achieved until the end of phase 1. Therefore, reclamation cannot proceed until the beginning of phase 2 for development work that has been performed in phase 1.

On Page 8 of the comment response letter received by the Agency on December 8, 2023, it is indicated that the RM pile will be reclaimed in a manner consistent with Plot 2 as described in the report "Revegetation Testing Program Monitoring: Summer 1998." "Table A-1: List of Plant Species on Revegetation Test Plots, July 1998," has been extracted from this report, and lists the species present on all test plots at the time of the observation. Please provide the September 2023 revegetation test plot site assessment report that was prepared by H2H, as described on Page 9 of the comment response letter. Based on the findings of this 2023

report, please provide a list of species that will be prioritized for use in reclamation of the RM pile and incorporate this information into the reclamation plan for Phase 1.

Response: In accordance with the test plot assessment in September of 2023, below is a list of the most successful species as it pertains to the reclamation vegetation and should be prioritized moving forward. As per the report, the best success rate came from a soil mixed with about 6 inches of topsoil and organic material, as well as being sown with seed and fertilized after the fact.

Common Name	Scientific Name
1. Paper birch-Tree	*Betula papyrifera*
2. Quaking aspen-Tree	*Populus tremuloides*
3. Canada goldenrod-Forb	*Solidago canadensis*
4. Sugar maple-Tree	*Acer saccharum*
5. Pearly everlasting-Forb	*Anaphalis margaritacea*
6. Striped maple-Tree	*Acer pensylvanicum*
6. Black cherry-Tree	*Prunus serotina*
6. St. John's Wort-Forb	*Hypericum perforatum*
7. Coltsfoot- Forb	*Tussilago farfara*
8. Green ash-Tree	*Fraxinus pennsylvanica*
8. Large-leaved aster-Forb	*Eurybia macrophylla*
8. Late Goldenrod	*Solidago altissima*

This list is in order of most to least successful species, and species with the same number had the same success rate. These species worked particularly well because they are early succession pioneer species. Many of them can handle an overall colder climate and can adapt to many different soils and even prefer finer soils such as sandy or silty loam.

4.) **As requested in the June 12, 2023, NIPA, please provide photos from Gore Mountain that are not taken during hazy/foggy conditions. These are necessary to provide an accurate representation of visual impacts and provide for a proper Visual Impact Assessment (VIA) of Phase 1.**

Successful reclamation is critical to minimizing visual impacts of the proposal. The VIA appears to use 100% reclamation success to mitigate cumulative visual impact. If reclamation is less successful, the visual impact will be greater than the VIA projects. Please revise the photographic simulations to show the minimally acceptable percentage of vegetative cover for all activities proposed to occur during Phase 1.

Response: Photographs have been retaken from Gore Mountain as requested, and photographic simulations of the RM Facility phasing have been redeveloped. The photographic simulations show the vegetative spacing identified during the September test plot reassessment and represent a conservative density of revegetation anticipated post reclamation activities.

As the project site is highly visible and nearby to the Hooper Mine site on the Forest Preserve, please provide Phase 1 photographic simulations for the Hooper Mine receptor location that also show a minimally acceptable percentage of vegetative cover and 100% reclamation success for all activities proposed to occur during Phase 1.

Response: The photographic simulations for all four phases of the project from Hooper Mine have been conducted and are presented in the revised Visual Impact Assessment located in Appendix O.

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The submission received by the Agency on December 8, 2023 states that the VIA has been revised to show the machinery, conveyors, vehicles, etc. near the top of the RM pile, as requested in the June 12, 2023 NIPA. However, the digital simulations do not appear to include or account for the machinery, conveyors, vehicles, etc. as the pile is laterally expanded in Phase 1. Please include these visual considerations.

Response: Mobile equipment that is expected to operate on the RM Facility have been added to the photographic simulations as requested and are presented in the updated Visual Impact Assessment located in Appendix O.

5.) **The Geotechnical Report indicates that the expanded RM pile footprint will be "cleared of all vegetation, grubbed and excavated to competent bedrock" and then "residual mineral sands shall be compacted in 1-foot-thick lifts, and compacted with a vibratory drum compaction roller." Please revise the noise impact analysis to include all activities and equipment proposed for use during Phase 1, including vegetation removal, excavation and compaction equipment and their individual sound levels, and estimated duration of associated equipment noise levels.**

The noise impact analysis received by the Agency on December 8, 2023, attempts to obtain ambient noise levels at the monitoring locations without the processing mill operating. However, the noise levels were obtained on August 17, 2023 (Thursday) and August 19, 2023 (Saturday). Does Barton plan to expand mining operations of drilling, rock breaking, grading, RM pile construction, shoveling and hauling to weekends - including Saturdays? Otherwise, the Saturday-recorded ambient noise levels are inappropriate to be used for comparison to weekday operations, either current hours of operation or proposed expanded weekday hours of operation. Please exclude these Saturday noise recordings from the revised noise impact analysis accordingly.

The noise impact analysis received by the Agency on December 8, 2023, states that future noise levels were modeled instead of calculated, as "the straight line project method used previously is more conservative and subsequently yields higher project sound levels than those projected from the dBmap software, which more accurately reflects sound attenuation…" In order to support the modeling results, the revised noise impact analysis must include the straight-line noise projection calculations for the residential receptor scenarios at M-3 through M-9, as well as a cover sheet with the seal of a NYS licensed professional engineer.

Response: The Sound Study, Appendix P, has been updated to include the vibratory drum compaction equipment. All other equipment planned for all four phases of mining have been included in the Sound Study.

Barton does not plan to expand mining operations or RM Facility construction to Saturday. Ambient data was taken on Saturday, August 19th, 2023, to supplement ambient data collected on Thursday

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due to inclement weather on Friday the 18th. Barton utilized the lowest recorded ambient sound levels between August 17th and August 19th in the revised Sound Study.

Barton has provided a comparison between the results of the dBmap software and the straight-line projection for a representative cross section in the revised Sound Study.

A cover sheet with the seal of a NYS licensed professional engineer has been added to the revised Sound Study.

6.) **The proposed water withdrawal from TW-04 appears to require installation of a new piping run from TW-04 to the processing mill. Will new vegetative clearing be required to accommodate the preferred new piping run route? If so, please show proposed limits of clearing on revised site plans and materials.**

Response: Additional water distribution piping will be necessary for the proposed TW-04 well installation. The proposed location of the piping will run alongside the existing freshwater piping. The location of this distribution network has been added to the Permit Modification Mine Plan figures. No wetlands will be impacted, and any clearing and grading will be minimal given that the proposed path is adjacent to the existing line. Vegetative clearing and grading will be under 5 acres and will avoid wetland impacts.

7.) **The proposal appears to result in the conversion of approximately 36 acres of forest to a non-forested cover type during Phase 1, and associated loss of forest carbon storage and forest carbon sequestration potential. Section 9.0 on page 56 of the narrative response document titled "Climate Change," should be revised to account for this loss.**

Response: The narrative has been updated to address Climate Change.

8.) **To provide for a coordinated review, please copy the Agency on all correspondence, comments and approvals from NYSDEC.**

Response: Barton will continue to coordinate with the APA and NYSDEC on all project responses and permit material updates.

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MINE PERMIT AMENDMENT & MODIFICATION
Barton Mines Company, LLC
Ruby Mountain Garnet Mine

NYSDEC Mine Permit #5-5230-00002/00002
Mine File #50483

APA Permit Nos.
P79-140, P70-356, P87-39, P87-39A, P87-39B, P88-393, P88-393A

Prepared for:

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July 2024

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1.0 INTRODUCTION

This document provides a synopsis of Barton Mines Company, LLC's (Barton) application to the New York State Department of Environmental Conservation (NYSDEC) for modification of Mined Land Use Plan (MLUP) Permit MLR#5-5230-00002/00002 and to the Adirondack Park Agency (APA) for an Application for a Major Project for the Ruby Mountain Garnet Mine (Site) located in the hamlet of North River in the Town of Johnsburg, Warren County, New York. This project requires a permit from the NYSDEC because the proposed activities are regulated under the Environmental Conservation Law (ECL), Article 23, title 27, and 6 NYCRR Parts 420-425. This project requires an APA permit because the project is located wholly within the Adirondack Park and is thus jurisdictional under Executive Law, Article 27, the Adirondack Park Agency Act (APA Act).

Barton has been an involved and engaged member of the Johnsburg/Indian Lake community for more than a century. In keeping with the company's enduring commitment to maintaining an open dialogue with other community members on matters of mutual interest, Barton has proactively informed the community of its permit modification request and invited public input since beginning the permit modification process in 2021. This outreach includes three public presentations, including a project information meeting attended by more than 70 community members; more than 20 project briefings to neighbors, community organizations, individual community leaders, and news media organizations; and two community mailings to more than 4,000 local property owners. A detailed listing of all community outreach efforts can be found in Appendix W.

The purpose of this application is to modify the current permits in a way that will allow Barton to increase the life of its Adirondack operations and accompanying economic benefits from the currently permitted 5 years to approximately 67 years.

Barton proposes to do so by gradually expanding the Life of Mine (LOM), which includes lateral and vertical expansions of the residual minerals (RM) engineered storage facility (RM Facility) and the quarry, remaining entirely on Barton property and in a manner that avoids/minimizes community and environmental impacts. RM are those minerals remaining after Barton has removed the marketable garnet and for which the company has not traditionally had commercial markets.

An updated Mine Permit Application Form (**Appendix A**) Organizational Report (**Appendix B**), and Full Environmental Assessment Form (**Appendix C**) are included with this application. H2H Geoscience Engineering (H2H) (now Bowman) has been retained to prepare this document on Barton's behalf. Bernard Melewski, Esq., has been retained by Barton as the lead contact for the project. The West Firm, PLLC is now a member of the Barton technical and legal teams providing support to the project through the final stages of permitting the project.

Consistent with long-standing NYSDEC policy and practice, the application documents have been drafted to include review of the entire LOM (i.e., 67 years, 253.1 acres), and the project has been broken down into four distinct phases to avoid and mitigate potential adverse environmental impacts to the maximum extent practicable. The application package, including all supporting reports and appendices, has been drafted to address potential impacts from the entire 67-year LOM through all four phases of operation under all operating conditions and development scenarios to support permitting of all proposed operations and activities.

The following is a summary of the proposed modifications to the existing permits.

- Expand the LOM from 194.5 acres to 253.1 acres (net increase of 58.6 acres, 7% of total Barton-owned mine Site land).
- Expand the quarry's lateral excavation boundary from 28.8 acres to 69.0 acres.
- Expand the quarry's excavation depth from 1,880 feet above mean sea level (amsl) to 1,720 feet amsl.
- Expand the RM Facility height from 2,275 feet amsl to 2,375 feet amsl (2,375 feet amsl temporarily with reduction by 20 feet at the end of mining activities to elevation 2,355 feet amsl)

and incorporate concurrent reclamation of the RM Facility through plantings to progressively blend the RM Facility into the surrounding landscape.

- Incorporate the proposed reclamation method within the quarry to allow the creation of fine-grained RM containment cells, created in formerly mined out areas, to eliminate a significant quantity of fine-grained materials from the RM Facility, to enhance the stability of the RM Facility, reduce fugitive dust emissions, and reduce the overall quantity of material placed in the RM Facility.
- Gradually increase off-site haul truck trips from an average of five trips per day to an average 16 trips per day, without impacting traffic flow or creating increased noise, to accommodate beneficial reuse of RM and reduce the quantity of RM placed in the RM Facility while reducing trucking hours by five hours daily
- Increase quarry operating hours by one hour (from 3:30 PM to 4:30 PM) to improve Site operations without adversely impacting the surrounding community.
- Reduce water withdrawal from Thirteenth Brook through the installation of a new freshwater well on Barton property.
- Return the Site to its natural aesthetic upon completion of all mining activities (final reclamation).

The following is a summary of the proposed modifications to existing permits and listing of additional permits required (and submitted) as part of this application:

- **Modification to NYSDEC Mined Land Reclamation Permit (DEC ID 5-5230-0002) and Modification of Existing APA Permit** – Barton will increase the authorized active mine from 194.5 acres to 253.1 acres. All conditions within the existing NYSDEC approved permit will be transferred to the new permit and renewed on a five-year basis. Ideally, the NYSDEC and APA will coordinate the five-year renewals. Existing permits have been included in **Appendix H**.

- **New NYSDEC Water Withdrawal Permit**: Barton has recently identified a new water source on the Site for use during the garnet beneficiation process. Commissioning of this well will allow Barton to rely less on surface water extraction from Thirteenth Brook. This permit application is located in **Appendix F**.

- **Modification to NYSDEC Multi-Sector General Permit (MSGP) - NYR00F623**: The

expansion of the RM Facility and quarry will modify the Site drainage conditions and require additional stormwater treatment facilities. These modifications can be found in **Appendix G** as an addendum to Barton's current MSGP – NYR00F623.

1.1 Background

Henry Hudson Barton began mining garnet on Gore Mountain in 1878. Barton Mines Corporation operated on the north side of Gore Mountain for approximately 105 years until relocating to Ruby Mountain in 1982. The history of Barton's operations in this area is chronicled on the Barton Mining website. https://www.barton.com/barton-garnet-mines-history/. Barton's Ruby Mountain Mine Site (i.e., the Site) is one of two large hard-rock garnet mines in the United States. The Site, which has been permitted and in continuous operation since 1982, is located west of New York State (NYS) Route 28 and north of Thirteenth Lake Road in the Town of Johnsburg, hamlet of North River, in Warren County (**Figure 1**). A portion of the Barton-owned property islocated within Hamilton County, but the majority of the mining operation is located in Warren County. Barton currently controls 848.6 acres at this Site. Within this 848.6-acre area, Barton has a permit with a current permit term affected area of 194.5 acres (NYSDEC MLR Permit 5-5230-0000/0002). Barton's Ruby Mountain Mine Site (i.e., the Site) is one of two large hard-rock garnet mines in the United States.

A Renewal/Modification of NYSDEC MLUP Permit MLR#5-5230-00002/00002 was approved in 2020 increasing the permit term affected area and allowing minor changes to the approved final floor elevation of the quarry. The Renewal/Modification document summarizes all activities permittedunder the current APA and NYSDEC permits to provide a clear outline of the currently permitted activities on the Site.The APA issued a letter on June 11, 2021, stating the Site is compliant with current APA Permits (**Appendix H**).

2.0 EXISTING CONDITIONS

2.1 Land Use and Zoning

The quarry is located on the eastern half of the mine property and is zoned by the Adirondack Park Land Classification for Industrial Use (**Figure 2)**. Under the Adirondack Park Land Use and Development Plan, New York State's creation of Industrial Use areas was intended to ***"encourage the continued operation of major existing industrial and mineral extraction uses important to the economy of the Adirondack region."*** Mineral extraction uses are also identified in the plan as being compatible with the Rural Use Area bordering the mine to the east and south and with the Resource Management Area on the western half of

the mine property where the RM Facility is located. The area surrounding the Site to the north and west is State Land Designated Wilderness Area. Land lying within 1/8th mile of State Land Designated Wilderness Area, as a portion of Barton's land does, is classified as Critical Environmental Area (CEA) by the APA (**Figure 1)**. The CEA is intended to provide a buffer between the State–owned Wilderness Area and other land uses that require closer agency review under the APA Act. The area within a five-mile radius of the Site is rural and mountainous, with scattered residences, timbering activities, and mining operations.

The APA Major Project permit form is provided in **Appendix I.** All structures located within 0.25 mile of the project Site are characterized as residential, commercial use, public use, or industrial use.

2.2 Topography

The topography throughout the Barton property is moderately steep, with elevations ranging from about 2,700 feet amsl atop Ruby Mountain to 1,600 feet amsl in Thirteenth Brook Valley to the east. The RM Facility lies adjacent to steep slopes on its northwestern border; a topographic swale extends from the RM Facility with eastern progression (**Figure 2)**. A similar pattern occurs directly east of the quarry, where the cliff face decreases in elevation east and south towards Thirteenth Brook. The mine is bordered to the north and south by mountainous terrain. Steep topographic drop offs occur to the north and east of the active mining area (**Figure 1).**

2.3 Water Resources

2.3.1 Wetlands and Streams

The Site is located approximately 0.5 mile northeast of Thirteenth Lake, with a small mountain in between. The intervening mountain acts as a natural buffer between mining operations (both existing and proposed) and Thirteenth Lake. The Site is 0.2 mile east of Thirteenth Brook that flows northeast, south of the Site. Drainage features on the Site, as well as Site stormwater systems,discharge into Thirteenth Brook as part of Barton's stormwater treatment operation (See Section 3.4: WaterPollution Control). Brown Pond Brook is the largest perennial stream on the Site. In general, it flows from north to south and separates the active mining area from the RM Facility. Thirteenth Brook enters the Hudson River approximately four miles to the east.

A formal wetland and stream delineation for the project Site was conducted by H2H in October 2018 (**Appendix J**) and September 2020 (**Appendix J**) following APA, NYSDEC and United States Army

Corps. of Engineers (USACOE) guidance documents. Once field work was complete, representatives from the APA and the NYSDEC confirmed the delineation in the field (November 2019). Five major features relative to the project Site were identified and mapped (**Figure 2):**

- The Finger Valley Wetland
- Wetland #2
- Slide Mountain Creek
- Brown Pond Brook
- Wetland #5

The hydrologic indicators for the wetlands included saturation in the upper 12 inches, inundatedconditions, water-stained leaves, drift lines, water marks, and drainage patterns associated with wetlands.

The wetlands on this property are primarily created within two hydrologic regimes. The first setting is a groundwater/slope seep wetland that is augmented by surface runoff. This type of wetland is located at the base of a slope or within isolated depressions. Water periodically fills or saturates these areas via groundwater and runoff from the surrounding slopes. These conditions can be observed within the Finger Valley Wetland particularly.

Other wetlands exist along the edges of the small, intermittent streams and are fed by flood waters from the stream and discharging groundwater along the stream edges. Slide Mountain Creek and Brown Pond Brook converge to create a wetland with APA jurisdiction at their intersection. Both streams are designated as Class C; Brown Pond Brook is noted to contain trout.

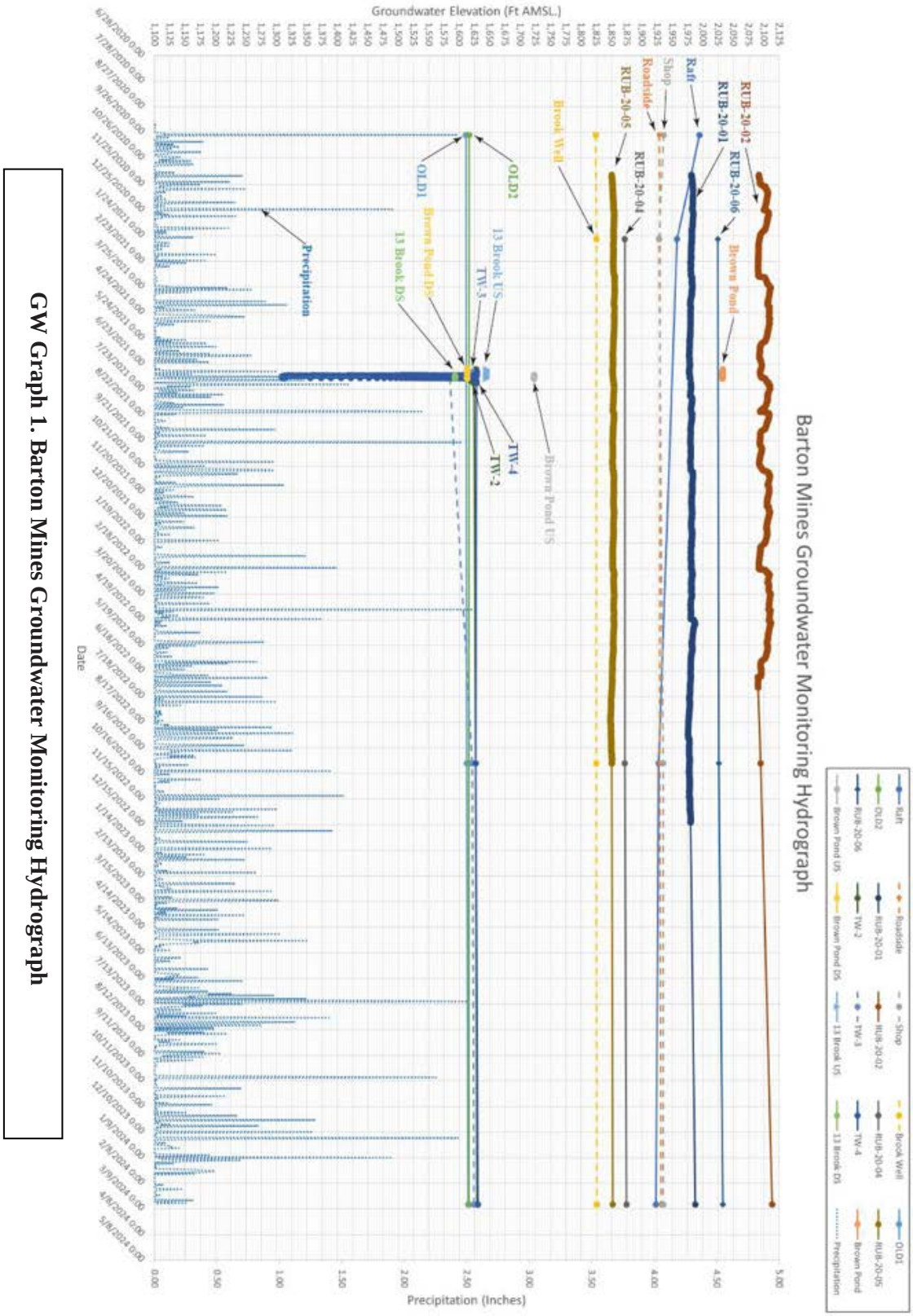
2.3.2 Groundwater

The groundwater system present throughout this region is a fractured hard-rock aquifer. In this type of system, the primary permeability of the crystalline bedrock is extremely low, and groundwater does not readily pass through the rock itself. Instead, water is transmitted through confined sets of naturally occurring fractures that crosscut the crystalline bedrock, traditionally referred to as secondary permeability. The apertures of these fractures are generally widest (and most weathered) near the surface but become narrower with depth due to increasing lithostatic pressure. As a result, groundwater mapping of a fractured hard-rock system can be very nuanced. However, in the case of the subject property, regional groundwater generally conforms with the topography.

Groundwater flow on the Site is from the northwest to the southeast following bedrock topography. The primary porosity of the bedrock being mined on the Site is very low. Groundwater storage and flow are controlled by secondary porosity features such as the network of variably permeable joints, fractures, and faults. Joint sets exposed in the quarry predominantly trend northeast to southwest and generally show little to no weathering or staining. Several faults were mapped within the quarry generally trending north to south, and these faults appear to have little signs of weathering or staining. Large-scale NYS brittle structure maps of the area do not show any features within the proposed quarry area.

Four groundwater monitoring wells (RUB-20-01, RUB-20-02, RUB-20-5, and RUB-20-6) wereinstalled within the proposed vertical excavation limit during July of 2020. Three former pumpingwells (Roadside Well, Brook Well, and Raft Pond Well) are also serving as additional monitoring wells.

Pressure transducers were placed in three of the monitoring wells (RUB-20-01, RUB-20-02, and RUB-20-5) to record hourly water levels; manual water levels were recorded at the additional monitoring wells. Recorded water levels from November 2020 to December 2022 indicated groundwater flows in a southwesterly direction flowing toward Brown Pond Brook. Groundwater levels ranged from a high of 2,106.4 feet amsl (RUB-20-02) to a low of 1,826.3 feet amsl (Brook Well) on January 5, 2021. A summary of all 14 monitoring wells on the subject property is shown in the mapping below, as well as other requested groundwater mapping and information.



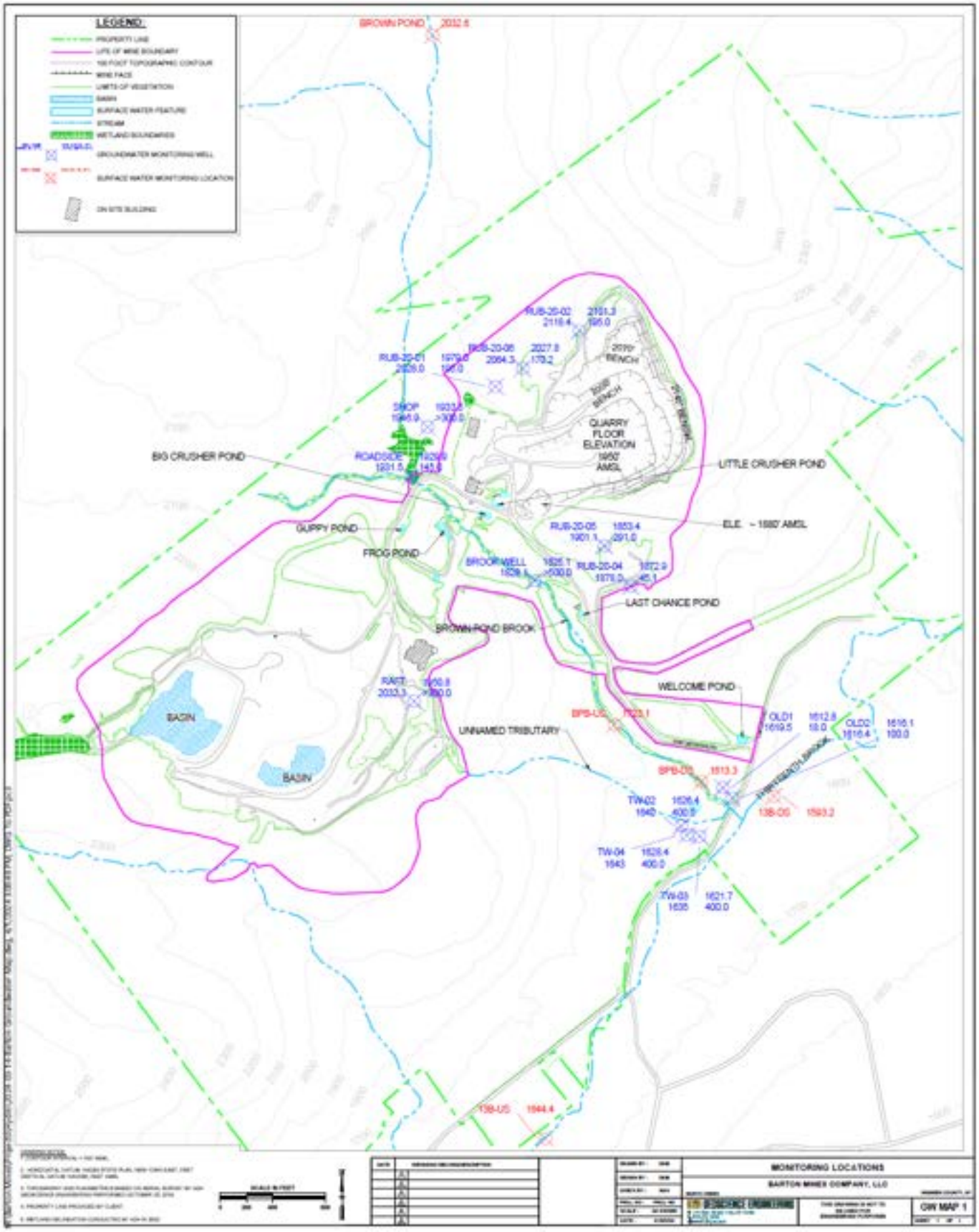
GW Graph 1. Barton Mines Groundwater Monitoring Hydrograph

Barton Mines Groundwater Monitoring Summary Table

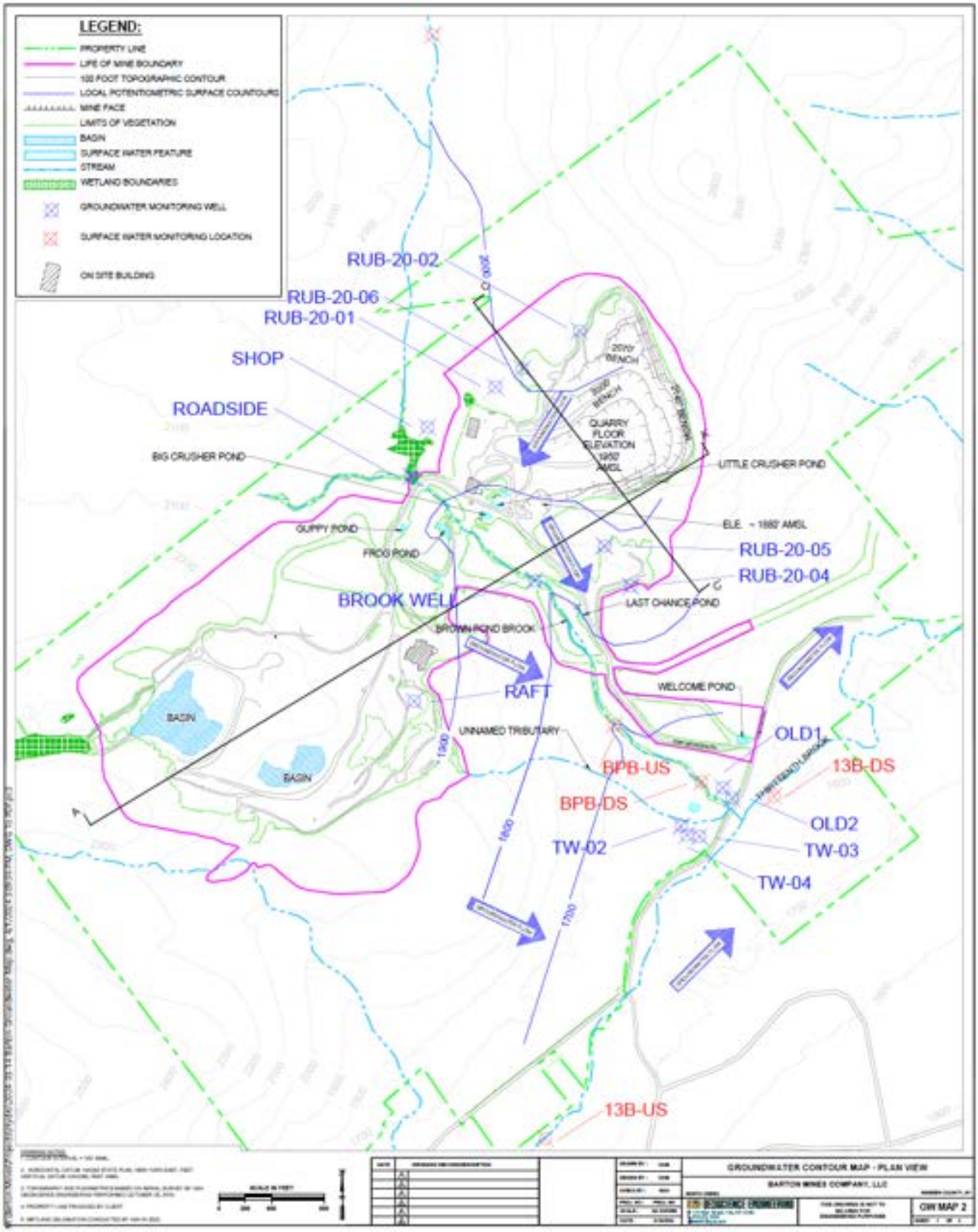
Well Name	Easting, Feet	Northing, Feet	Ground Elevation, Feet AMSL	Total Depth, Feet	Maximum Water Level, Feet AMSL	Average Water Level, Feet AMSL	Minimum Water Level, Feet AMSL
Raft	593,647.62	1,784,380.27	2,032.30	>300.0	1,994.6	1,950.8	1,923.1
Roadside	593,623.71	1,786,097.14	1,931.49	145.0	1,931.5	1,929.9	1,928.7
Shop	593,749.66	1,786,471.94	1,946.94	>300.0	1,935.7	1,933.5	1,928.0
Brook Well	594,566.48	1,785,298.07	1,828.09	>500.0	1,825.9	1,825.1	1,824.3
OLD-1	596,001.65	1,783,719.92	1,619.50	18.0	1,614.7	1,612.8	1,611.1
OLD-2	596,071.20	1,783,639.54	1,616.40	100.0	1,616.4	1,616.1	1,616.0
RUB-20-01	594,267.92	1,786,779.36	2,027.96	195.0	1,987.7	1,979.0	1,975.7
RUB-20-02	594,907.83	1,787,206.39	2,118.41	195.0	2,113.6	2,101.3	2,090.1
RUB-20-04	595,300.02	1,785,257.49	1,877.98	45.1	1,874.7	1,872.9	1,871.9
RUB-20-05	595,098.18	1,785,565.83	1,901.06	291.0	1,856.0	1,853.4	1,848.3
RUB-20-06	594,474.27	1,786,918.66	2,062.56	170.2	2,032.9	2,027.8	2,024.4
TW-2	595,684.43	1,783,428.68	1,640.00	400.0	1,629.4	1,626.4	1,610.9
TW-3	595,824.07	1,783,349.08	1,635.00	400.0	1,624.4	1,621.7	1,583.7
TW-4	595,726.16	1,783,357.57	1,643.00	400.0	1,630.7	1,628.4	1,627.3
Brown Pond	593,787.61	1,789,461.65	2,035.00	N/A	2,032.7	2,032.6	2,032.3
BPB-US	595,173.47	1,784,199.33	1,724.00	N/A	1,723.2	1,723.1	1,722.6
BPB-DS	595,838.81	1,783,765.07	1,614.00	N/A	1,613.5	1,613.2	1,612.8
13B-US	594,648.89	1,781,043.99	1,646.00	N/A	1,644.6	1,644.4	1,644.2
13B-DS	596,389.12	1,783,654.69	1,594.00	N/A	1,593.3	1,593.2	1,593.1

All coordinates are in the State Plane Coordinate System.
Ground elevations highlighted in yellow represent the land surface elevation adjacent to the transducer.

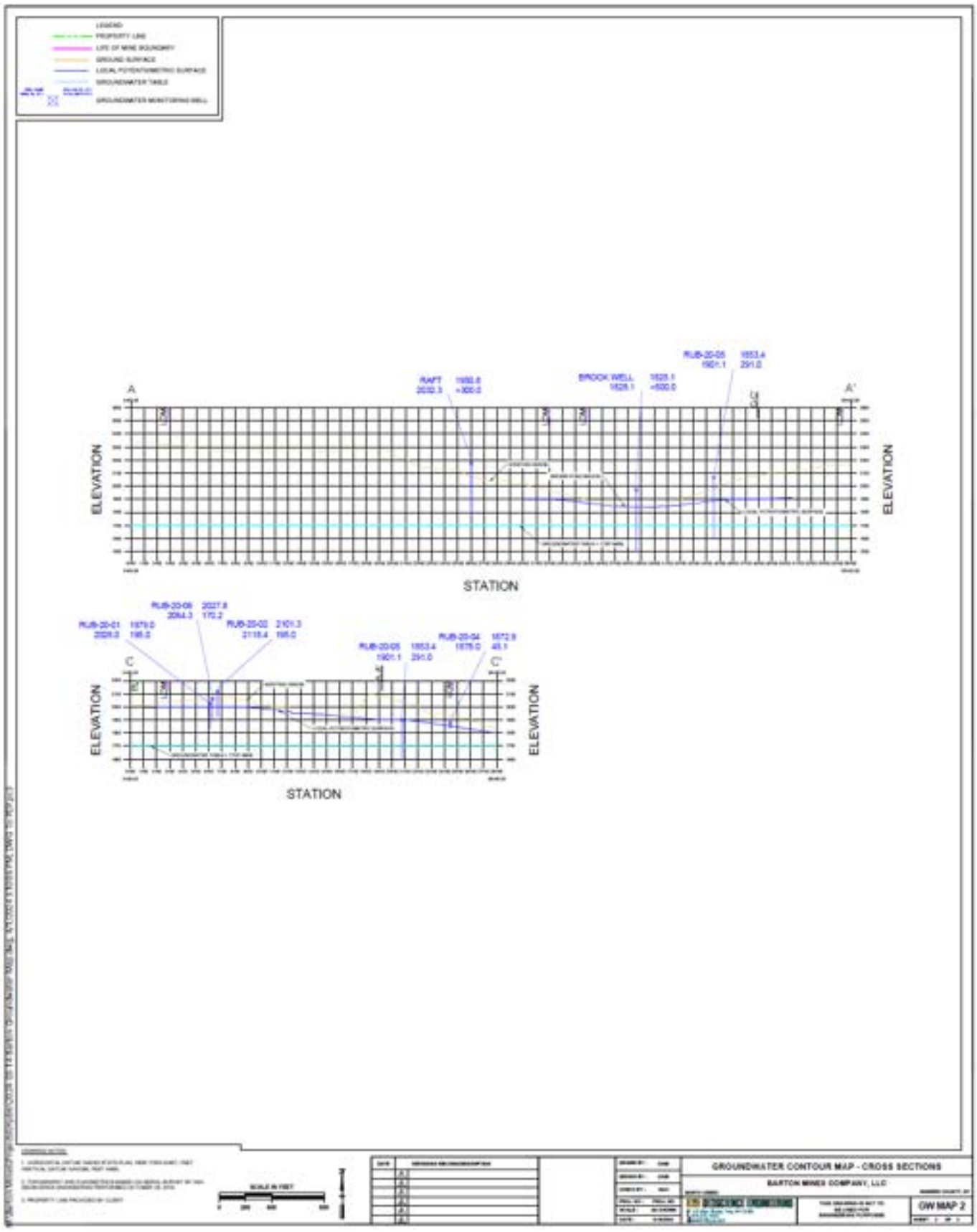
GW Table 1. Groundwater Monitoring Summary Table



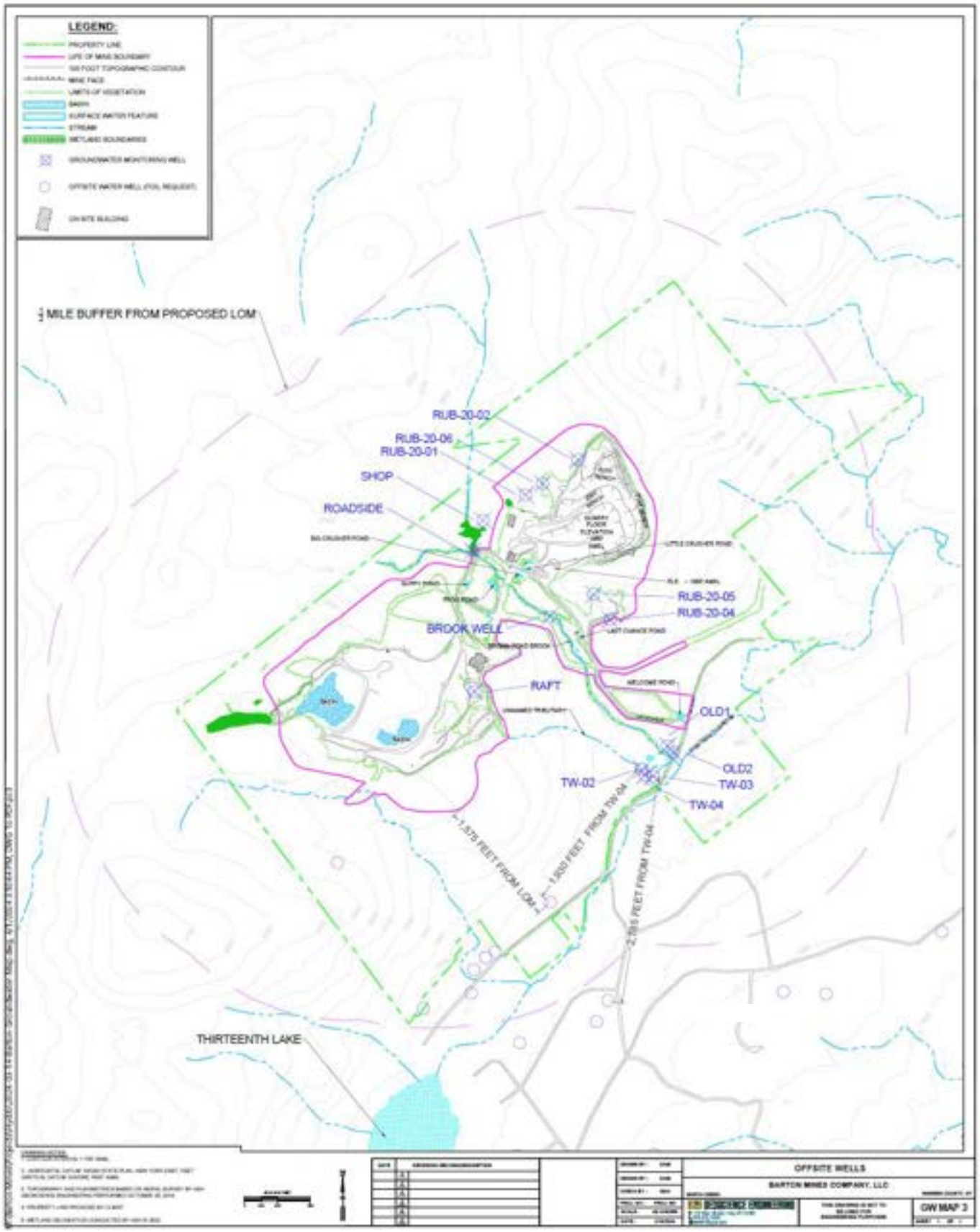
GW Map 1. Monitoring Locations



GW Map 2. Groundwater Contour Map – Plan View (Sheet 1 of 2)



GW Map 2. Groundwater Contour Map – Cross Sections (Sheet 2 of 2)



GW Map 3. Off-site Wells

2.4 Vegetation

The land surrounding the project Site is mostly forested with mixed northern hardwoods and conifers. Dominant species include eastern hemlock (*Tsuga canadensis*), paper birch (*Betula papyrifera*), red maple (*Acer rubrum*), striped maple (*Acer pensylvanicum*), balsam fir (*Abies balsamea*), and beech (*Fagus grandifolia*). The understory, consisting mostly of shrubs and ferns, is sparse, generally occurring in open areas on the Site and exhibiting historical disturbance from access road development. The limits of vegetation are depicted in **Figure 2.**

Wetland vegetation typically consists of ferns, such as sensitive fern (*Onoclea sensibilis)* and lady fern (*Athyrium filix-femina*), sedges, such as woolgrass (*Scirpus cyperinus*), and small shrubs and trees, such as red maple. Sphagnum mosses (*Sphagnum sp*.) blanket wet rock surfaces within the wetlands.

2.5 Threatened and Endangered Species

The project Site is mapped by the NYSDEC to contain rhodora (*Rhododendron canadense)* and Northern Long-eared Bats *(Myotis septentrionalis),* which are classified as threatened species in the State of New York (Figure **2)**. According to the New York Natural Heritage Program (NYNHP), rhodora has been historically confirmed within the Town of Johnsburg, but there has been no recent documentation of presence.

2.6 Archaeological and Cultural Resources

The Office of Parks, Recreation and Historic Preservation (OPRHP November 2020) stated that no properties eligible for the New York State and National Registers of Historic Places would be impacted by this project (**Appendix K**).

2.7 Geology

2.7.1 Regional Setting

The Site is located in the granulite facies Central Highlands portion of the Adirondack region. This region contains gabbroic rocks which commonly contain megacrystic garnet. Similar deposits can be found at Cranberry Lake, Warrensburg, and Speculator, but the garnet deposits at Gore Mountain tend to be largest and encompassed by a shell of hornblende up to 4 centimeters (cm) thick.

2.7.2 Bedrock

The bedrock geology on the mine Site represents intrusive igneous rock metamorphosed into anorthositic gneiss from the Middle Proterozoic mixed with hornblende-rich garnet gneiss along the southern margin of an olivine, gabbro body. The minerology is mainly feldspars and hornblende (about 85%) with smaller components of magnetite, garnet, and accessory minerals.

Geologic exploration by Barton over the life of the operation has demonstrated that the ore body exists, at a minimum, within the currently permitted area at depth, and to the north, east, and south of the active excavation area. Given the geologic trends, it is likely that the ore body continues beyond the exploration limits to the east, north and west.

2.8 Products

The garnet mined by Barton at Ruby Mountain is greatly reduced in size (0.6 cm to 0.25 micron) for use as an abrasive in waterjet cutting and abrasive blasting, and as powders for industrial uses. Barton's products represent approximately two percent of the abrasives markets, with approximately 450,000 tons of ore required to meet yearly demand. The unique "pseudo-cleavage" of the Barton garnet, which produces sharp, angular fragments with great cutting ability, makes it a high-quality abrasive (Kelly 2016). Additionally, Barton garnet contains little to no respirable silica and no heavy metals or chemical residues which makes the product highly desirable to customers for increased health and safety as well as environmental compliance.

In addition to its traditional garnet products, Barton has recently begun to develop markets for those RM resources that remain once the garnet has been removed from the ore. The RM are separated into coarse- and fine- grained materials as part of the garnet processing operation. The coarse-grained (sand-sized) material represents approximately 90% of what is mined at the Site and is considered a mineral resource/product by Barton. Developing markets for coarse-grained RM will further strengthen the long-term health of Barton's business and minimize the amount of RM that requires on-site storage.

2.9 Soils

The dominant soils within the Site are well-drained sandy loams with outcrops of rocks and boulders. The surface soils are thin and contain weathered bedrock with up to 20 feet of till over bedrock in depressions.

The soils underlying wetlands consist mostly of peats and muck with fine sand and roots. The hydric indicators for the wetland areas were low chroma soils containing ferrous iron deposits and the presence of histosols and muck.

3.0 MINING METHOD AND OPERATIONS

3.1 History

Henry Hudson Barton began mining garnet on Gore Mountain in 1878. Barton Mines Corporation operated on the north side of Gore Mountain for approximately 105 years until relocating to Ruby Mountain in 1982. The garnet was originally shipped via the North Creek railroad to Philadelphia for further processing at the Barton sandpaper plant (Kelly 2016). Barton today is owned by the descendants of Henry Hudson Barton, who carry on the traditions of responsible natural resource management and providing high-quality Adirondack region products to customers around the world. https://www.barton.com/barton-garnet-mines-history/.

3.2 Overview

Barton mines a high-quality, garnet-bearing gneissic consolidated rock by traditional drilling and blasting methods, advancing a series of approximately 60-foot-tall east-west trending mine faces in a northerly direction. Material is loaded from the active mine face by excavator into an off-highway haultruck. Material is taken from the active quarry area to the nearby primary crusher, which is contained in the crusher building. Crushed material is conveyed to the on-site mill for additional processing and removal of RM. RM from the mill are hydraulically conveyed to the RM Facility, and water is recovered through a series of drains and ponds for reuse in the beneficiation process. The garnet separated at the mill is hauled to Barton's Hudson River Plant (3.6 miles away, in the Town of Indian Lake) for final processing and shipment directly to customers by on-road haul vehicles. The current permitted quarry life is approximately 19 years, but the functional life is estimated to be just five years primarily related to the limited availability of RM storage space under the current permits. The current method of mining and processing is already approved by NYSDEC and APA, as reflected in NYSDEC MLR Permit 5-5230-0000/0002 and APA Permit P87-39 (**Appendix H**).

3.3 Residual Minerals Storage

The RM produced from the garnet beneficiation process consist mainly of feldspar, amphibole/pyroxene and garnet minerals and a small fraction of micas and ilmenite.

The RM meet NYSDEC's criteria for uncontaminated rock to be used as a substitute for conventional aggregate, pursuant to 6 NYCRR Part 360-1.5(b)(11), and are not considered a solid waste (**Appendix R**). Furthermore, the RM meet the criteria set forth by the OSHA Hazard Communication Standard as a mixture that does not contain carcinogenic properties, pursuant to 29 CFR 1910.1200. The RM have been tested by third-party accredited laboratory methods and have been confirmed to contain less than trace quantities (<0.01%) of heavy metals and respirable quartz (free silica).

RM produced at the mill are hydraulically conveyed to the RM Facility where they are separated by a cyclone system into fine-grained (silt/clay particle size) and coarse-grained (sand particle size) RM. Fine-grained RM that leaves the cyclone system is in the form of a slurry that is conveyed via gravity to the upper pond where they settle to the bottom. Then, the water filters through the RM Facility, and the water is recovered in the lower ponds for reuse in material processing at the on-site mill. Coarse-grained RM remains at the RM Facility.

This RM sorting and storage process is approved by the NYSDEC and is referenced in APA permit P87-39, issued January 7, 1988. The NYSDEC's approved lateral limit ("footprint") for the RM Facility is shown on Barton's Mine Plan Map, updated December 8, 2014 (**Figure 3**), referenced in MLR Permit 5-5230-0000/0002. Barton's Mine Plan Map shows a RM area of 73.0 acres with a future RM area of 12 acres, totaling 85.0 acres of RM storage. The currently permitted peak elevation for the RM Facility is 2,275 feet amsl with a reclamation side slope of 2:1 based on Reclamation Plan Map and Cross-Sections updated in March of 2009 (**Figures 4 and 5**) and referenced in MLR Permit 5-5230-0000/0002. APA Permit 87-39B allows a RM Facility lateral footprint of 73.0 acres, peak elevation of 2,275 feet amsl, and a reclamation side slope of 2:1.

3.4 Water Pollution Control

Barton prevents the pollution of surface water and groundwater on the Site by controls implemented under its current State Pollutant Discharge Elimination System (SPDES) permit (**Appendix L**) and Barton's MSGP (**Appendix G**). SPDES Outfall 001 discharges treated runoff and process water from the Site to Thirteenth Brook (**Figure 2**). Outfall 002 discharges treated process water and runoff from the Site to an unnamed tributary of Thirteenth Brook. APA permit 87-39B states that treated effluent (per SPDES permit requirements) is regulated by SPDES Permit NY-0034959. Barton is currently in compliance with SPDES Permit NY-0034959. The Site's Storm Water Pollution Prevention Plan (SWPPP) (July 7, 2014, and updated plan April 2023) referenced in MLR Permit 5-5230-0000/0002 reflects additional stormwater

controls that have been added (**Appendix G**).

3.5 Water Withdrawal

The mineral processing that takes place at the mill requires a modest amount of fresh water. Barton has process water recycling systems in place on the Site, but some fresh water is required as make-up water for the system. Barton currently uses Thirteenth Brook as a source of make-up water (**Figure 2**). Fresh water is pumped at a rate of 68 gallons per minute (gpm) from a submersible pump in Thirteenth Brook to the mill. Water withdrawal is below 69 gpm (or 100,000 gallons per day), and a NYSDEC Water Withdrawal Permit is not required. APA Permit 87-39 provided authorization to withdraw water at a rate up to 68 gpm from Thirteenth Brook to the mill via an above ground supply line.

3.6 Blasting

Blasting has been utilized since the Site was permitted, with no off-Site or on-Site incidences to date. All blasting is monitored, with records maintained on the Site in accordance with NYSDEC and APA Permits. Two to three blasting events are conducted per month, depending on demand, and are performed by a third-party blasting contractor licensed by the NYS Department of Labor.

Blasting conditions included in MLR Permit 5-5230-0000/0002 are as follows:

- Blasting is permitted between the hours of 9:00 a.m. and 4:00 p.m., Monday through Saturday. Noblasting is permitted on Sundays or legal holidays.
- Air blast limits shall not exceed 133 decibels (dB) at the location of a dwelling, public building, school, church,or community or institutional building outside the permit area.
- Ground vibration limits shall not exceed the limits described in the U.S. Bureau of Mines Report ofInvestigation 8507 (Figure B-1).
- No storage of explosives is allowed on the Site. The subcontracted NYS-licensed drilling and blasting company transports reagents tothe Site as necessary to conduct its blasting operations.
- No fly rock is allowed beyond the property line, including fly rock that travels in the air or along the ground.

Blasting conditions included in APA Permit 79-356 are as follows:

- Blasting is not permitted to occur under atmospheric inversions unless such conditions have persistedfor at least 72 hours.

Barton has had no known violations of the above conditions. An updated blasting plan for this Site has been included in **Appendix S**.

3.7 Trucking and Operational Hours

Barton is currently permitted by the APA (Permit 79-356) to operate its primary crushing and milling operations 24 hours a day, 7 days a week. Quarry operations are permitted Monday through Friday from 7:00 a.m. to 3:30 p.m. Barton's on-site mining vehicles can operate between the hours of 7:00 a.m. and 3:30 p.m., Monday through Friday. Barton operates its primary crusher Monday through Saturday; an excavator and truck are used to feed the crusher on Saturday from an adjacent stockpile (which is established during weekday quarry activity). Processed garnet produced at the mill is permitted to be hauled to Barton's Hudson River Plant (**Figure 1**) by one on-road haul truck for an average of five trips per day. No truck traffic is permitted on Thirteenth Lake Road, on any day, between the hours of 10:00 P.M. and 7:00 A.M. Contractor truck traffic associated with the mining operation is restricted to 7:00 a.m. to 3:00 p.m., Mondaythrough Friday. Table 1 summarizes hours of operation.

Table 1: Currently Permitted Hours of Operation Summary

Activity	Blasting	Quarry Mining	Mineral Processing (Crushing and Concentrating)	Off-SiteHauling	Supplier Vehicle
Days	Monday-Saturday	Monday-Friday	Monday-Sunday	Monday-Friday	Monday-Friday
Hours	9:00am - 4:00pm	7:00am-3:30pm	24 hours	7:00am-10:00pm	7:00am-3:00pm
Notes	Blasting not permittedon legal holidays or during an atmosphericinversion	Includes drilling, rock breaking, shoveling, and hauling	1) mill discharge; 2)pile, road, snow, & stormwater mgt. 3) daytime feeding fromadjacent stockpile	Emergency exception: breakdown of haul truck and Ruby Mtn finished garnet storage capacity (Saturday 7:00am to 4:00pm)	For non-Barton vehicles

3.8 Reclamation

NYSDEC reclamation conditions are stated in MLR Permit 5-5230-0000/0002. Those conditions state that topsoil from all affected areas will be stripped, stockpiled, and vegetated before overburden stripping operations take place. Topsoil stockpile locations are shown on the proposed mine plan maps (Figures 6-9). Current reclamation conditions approved by the NYSDEC are shown in **Figure 4** under the heading "Reclamation Notes."

APA reclamation conditions referenced in APA Permit 87-39B are described in Section 4.0 of the report titled "Revegetation Testing Program Monitoring: Summer 1998" and Sections 2.1-2.3 of the report titled "Revegetation Testing Program Monitoring: Summer/Fall 1999" (**Appendix N**). The referenced 0.9-acre "Reclamation Test Plot Area" is shown on **Figure 2**.

4.0 JUSTIFICATION OF NEED

Under the current permit, Barton will run out of storage capacity for its fine-grained RM in just five years, forcing the end of all mining activities. This application proposes modifications to, and an expansion of, the company's RM Facility, along with an expansion of the mine's boundaries, that will bring their projected life spans into alignment and extend the life of Barton's Ruby Mountain operations by approximately 67 years, encompassing four phases of mining over the entire LOM, with permit renewals required every five years. These expansions will take place entirely within Barton's current property boundary. The expansion of the mine boundary ***will not change the method or the rate of mining activity at the Site***, but rather will allow Barton to progressively move its active mining into new, contiguous areas

as the garnet ore in areas where crews are currently working are depleted. This has been the standard method of operation since the mine opened in 1982.

4.1 Geologic Uniqueness

Barton's Ruby Mountain mine is one of just four large hard-rock garnet mines in the world, and one of only two in the United States where garnet is extracted from hard-rock ore. The Barton ore deposit is recognized as being unsurpassed in quality and having no health, safety or environmental concerns, leading to its use in several specialized military, industrial, and medical applications. Garnet imported to the United States from foreign countries is mainly derived from alluvial deposits, resulting in rounder particles that are less desirable for water jet cutting and blast media. A permitted operating facility in this geologic setting is irreplaceable in the State of New York and nationally.

4.2 Barton Mines Regional Economic and Community Impact

Barton's fully integrated operations in Johnsburg, Indian Lake, and Glens Falls employ more than 125 people in mining, manufacturing, trucking and heavy equipment operation, millwrights, electricians, engineering, purchasing & supply, human resources, health, safety & environmental management, and facility administration. Barton's operation contributes approximately $15 million annually to NYS's economy (before any economic multiplier). This includes approximately $8 million for wages and benefits, along with $7 million for purchases of goods and services from local businesses. Approximately 30 businesses in Warren, Hamilton, and Essex counties provide Barton with construction and maintenance services, industrial equipment, and consumable supplies. Schools and municipalities also benefit from Barton's payment of over $400,000 annually in local property taxes.

Barton and its employees are deeply integrated into the regional community. The company supports a wide variety of not-for-profit organizations with donations of money and in-kind services, and team members volunteer their time to organizations throughout the region.

4.3 Alternatives

With the aim of minimizing environmental/community impacts but also allowing for continued responsible resource development at the Site, Barton evaluated a number of alternatives to the current proposal. As found in that assessment, the proposed permit modification presents the best-case scenario for Barton's working within the Site's operational constraints to utilize on-Site ore reserves, while also minimizing

environmental/community impacts (e.g., visual, dust, noise, wetlands, surface water, etc.).

As more fully explained below, Barton's analysis of alternatives began with an assessment of the myriad of interrelated factors that affect mine operations – among them, estimated ore reserves, Site and operational constraints, and environmental concerns. Within the confines of these limitations, Barton then explored a number of options to extend Site operations beyond the five-year life span of the current RM Facility, addressing both feasibility and environmental concerns. These considerations include, among other things, off-Site acquisition and use scenarios and alternatives as to RM Facility design/configuration, fine-grained RM management, and quarry configuration/operation. Each of these matters is discussed, in turn, below.

4.3.1 Assessment of Ore Reserves and Other LOM Considerations

Barton expended considerable effort to accurately map the lateral and vertical extent of the ore body on the Site and develop a reliable estimate of ore reserves. The results of these efforts have proven that the ore body could potentially sustain ore production for hundreds of years. However, the life of the operation is ultimately limited by several compounding interrelated factors, including the following:

- Ore quality
- Garnet recovery
- RM storage capacity
- Water recovery
- Adjacent landforms and land use classifications
- Economic viability
- Environmental impacts
- Sales and competing markets

Fundamentally, Barton must manage the Site's complex relationships among ore quality, mineral reserves (lateral and vertical extents), residual mineral generation (coarse- and fine-grained percentages), water reuse and recirculation, new product development, economics and potential environmental impacts. Barton has conducted exhaustive mine planning, mineral exploration, ore quality assessments, hydrogeologic investigations, geotechnical studies, process engineering studies, surface water evaluations, wetland studies and other environmental impact assessments to optimize the use of this unique natural resource while also minimizing the potential environmental impacts to the community.

With these considerations in mind, as set forth below, Barton's technical team and consultants explored a number of options for extending the life of the company's operations beyond the five-year life span of the currently-permitted RM Facility.

4.3.2 Potential Acquisition of Adjacent Property; Lateral Restrictions

As an alternative to the proposed permit modification, Barton considered the potential for acquiring additional properties adjacent to the Site for the purpose of expanding RM storage or mineral extraction. The potential for acquiring such properties is, however, highly unlikely. As can be seen in Figure 2, the perimeter of Barton's property on the east, north and west are State-owned lands with APA Wilderness classification. The topography to the east of Barton's quarry is comprised of steep slopes that are unusable for storage or quarrying without significantexpenditures to develop these areas. Although ore is likely to exist east of the proposed eastern mining limit, further development, whether for ore or RM storage to the east would create greater noise, dust andvisual impacts to the community. For these reasons, lateral expansion outside of the currently owned and proposed limits within the Barton property is not a viable option.

4.3.3 RM Facility Design/Expansion Considerations; Site Operational Restrictions

(a) Vertical Expansion of the RM Facility Requires Storage of Fine-Grained RM Elsewhere

An important consideration relative to expansion of the RM Facility is slope stability. Barton employed a world-renowned specialized geotechnical engineering firm to design and plan the buildout of the RM Facility to ensure that slope stability meets or exceeds generally accepted engineered safety factors. Results of this work indicate limitations as to how the RM Facility can expand vertically and laterally.The most significant finding is that for the RM Facility to expand vertically (with side slopes of 2:1, H:V), fine-grained material needs to be permanently stored elsewhere. As indicated previously, fine-grained RM requires lateral containment on all sides due to the lack of cohesive strength.

As explained earlier, ore materials extracted from the quarry are hauled to the primary crusher.Crushed material is then conveyed to the mill for processing and beneficiation. RM from the mill are hydraulically conveyed to the RM Facility as a slurry through a series of pumps and pipes. Once the slurry has reached the top of the RM Facility, solids are separated by a cyclone system into coarse-grained and fine-grained RM. Coarse-grained RM, similar to the consistency of sugar, exit the top of the cycloneas a wet, coarse -to

-fine sand, with internal strength parameters that allow the material to be stored in the RM Facility. Fine-grained RM, the consistency of flour, exit the cyclone as a slurry (ranging from 4% - 7% solids, 96% to 93% water) and are conveyed to settling ponds located within the RM Facility where the fine-grained RM settle out and water is recovered by a series of underdrains forming a closed-loop system for process water. Fine-grained RM are composed of particle sizes that range from silt to clay with very little cohesive strength, therefore requiring lateral containment for storage. Process flow measurements have shown that, on average, the composition of RM generated on the Site is 90% coarse-grained and 10% fine-grained materials. The end result, however, is that a significant amount of fine-grained RM is generated on-Site and cannot be stored in the RM Facility if the RM Facility is to be vertically expanded.

(b) RM Facility Expansion Scenarios

Given these limits on containment of fine-grained RM, Barton evaluated the following alternatives for RM storage:

1) **Limit Height of RM Facility/Laterally Expand to South and West**: If fine-grained RM continue to be stored within the RM Facility, then the height of the RM Facility cannot be extended beyond its current elevation of 2,275 feet amsl, due to the fact that water recovery basins are required at the top of the RM Facility to capture process water and settle fine-grained RM. This would result in Site operations ending in five years or require a lateral expansion of the RM Facility to the south. There are several problematic issues with lateral expansions of the RM Facility as listed below:

    - **Water Recovery Issues:** The garnet beneficiation process requires the use of clean water. The current RM Facility was sited in its current location specifically to enable the recirculation of water on the Site. The natural topography in the vicinity of the current RM Facility forms a single drainage basin in that water dischargedwithin the RM Facility drains to a single collection point through gravity-assisted underdrains. If the RM Facility were expanded laterally, the recovery of process waters would require the construction of ponds and embankments in steep, undulating topography, adding additional geotechnical risk to long-term operations. Recovery ponds located outside of the current drainage basinwould require the construction of impoundments on steep slopes, pumping, an increase in energy use, and new water distribution infrastructure to transmit process water back to the plant to maintain the closed-loop system. These additional capital expenditures and maintenance costs, as well as additional risk, make a southern lateral expansion a non-viable option.

      The lands to the west of the current RM Facility also consist of steeply sloping topography with

streams and additional wetlands. Expansion of the RM Facility to the west would require the relocation of a stream channel and construction of an impoundment and infrastructure to handle process water. This would result in additional surface water and wetlands impacts, as well as significant visual impacts from Thirteenth Lake.

- **Additional Visual Impacts:** During the Visual Impact Assessment, multiple RM Facility configurations were considered. It was determined that the topographic peak to the west of Barton's property provides significant visual screening to receptors west of the operation, most significantly Thirteenth Lake and the recreational trails and campsites located in the vicinity. Expanding the engineered RM Facility laterally to the south would extend the RM Facility beyond that peak and visibly expose the operation to those receptors**.** Therefore, a southern expansion of the RM Facility was not considered a viable option moving forward.

2) **Store Fine-Grained RM Off-Site**: There are no permitted, economically feasible, Barton-owned properties that can accommodate the volume of RM generated from the mine**.** The mining operation generates approximately 250,000 cubic yards of RM per year. If all RM were trucked from the RM Facility, it would increase vehicle traffic on Thirteenth Road by approximately 50 truck trips per day, 365 days per year. Approximately 10% of the RM generated is fine-grained and would require significant processing and, potentially, chemical additions to transform the RM into a dewatered state where it could be loaded into a truck for transport. For these reasons, off-Site storage of RM is not considered a practical, environmentally sound, or economic option.

3) **Create New On-Site RM Storage for Fine-Grained RM**: Barton has two options for storing fine-grained RM on the Site that would extend the mine's operational life. The first option is to store the materials within the existing RM Facility with a large western and southern lateral expansion. As discussed above, this option was evaluated and determined to be infeasible. The second option is to construct containment cells on-Site to store the fine-grained RM. Storing fines within excavated portions of a quarry is a common reclamation practice.

Two types of on-Site containment cells were considered:

Engineered Soil Cells. Containment cells constructed from engineered soils are routinely used in mining operations across the country for storage of fine-grained RM. Soil cells are used to form a perimeter embankment, and then fine-grained RM are pumped into the cells for permanent storage. This method works well in areas with flat topography and on sites that have enough available space to

commit to this storage method. At the Ruby Mountain Site, the slopes are steep across the property requiring higher embankments and creating an increased long-term risk associated with maintenance and monitoring. In addition, Barton is environmentally conscious with the available space on the Site, and all areas not utilized for mining or mining support remain vegetated. In order to create storage cells using engineered soils, Barton would need to expand the LOM boundary laterally, clear vegetation, and regrade large portions of the property. Given the additional risk, environmental impact, and cost associated with these types of containment cells, they were not considered a viable option.

Hard-Rock Cells. Backfilling a quarry with RM, overburden or other unsaleable material reduces the quantity and expanse of above-ground storage. As an alternative to engineered soil embankments, Barton investigated the possibility of creating this type of storage within the hard-rock quarry as a function of mining. There are several distinct advantages to using hard-rock cells for containment of fine-grained RM. First, these types of cells provide ample support with no risk associated with embankment failure. In addition, given the strength of the hard-rock within the quarry, the containment cells can be significantly deeper than an engineered embankment, allowing a further reduction in overall project footprint (and any resulting environmental impact). This method of storage drastically reduces the footprint of the mining operation as compared to other alternatives and drastically reduces **any** risk associated with long-term maintenance and monitoring. For these reasons, Barton selected hard-rock containment cells as the best option for future fine-grained RM storage.

4.3.4 Quarry Expansion Considerations, Restraints and Alternatives

The hard-rock storage methodology requires Barton to mine strategically and in a sequence (phases) whereby enough storage capacity is continuously generated during mining operations to support future deposition of fine-grained RM. The phasing of mining operations allows for concurrent reclamation – namely, placement of fine-grained RM as hard-rock cells become available after mining operations are completed in those cells. This methodology, while beneficial from an environmental perspective, results in sacrificing ore reserves at depths below the cell, thus resulting in a trade-off: losing valuable ore reserves versus minimizing environmental impacts. As discussed below, with these considerations in mind, Barton evaluated several mine plan options, ultimately selecting the alternative set forth in the permit modification application.

(a) Loss of Ore Reserves from Hard Rock Cell Storage; Quarry Expansion to Off-Set Loss

The primary issue with utilizing quarry space for permanent fine-grained RM storage is the sterilization

(inability to further mine) of reserves below the storage cells. As previously indicated, the ore body at the Site has the potential to sustain mining activities for well over one hundred years – far longer than the LOM being proposed in the permit modification application. The most efficient mine plan design possible when incorporating RM hard-rock storage cells, however, reduces theLOM to 67 years. By operating in this manner, Barton would be sacrificing the maximum potential life of the operation (i.e., significant ore reserves at depth) in order to reduce environmental impacts, reduce capital expenditures, and manage long-term risk. To realize the 67-year LOM, Barton, however, must expand the quarry to the north and south, thus off-setting the loss of reserves below the planned hard-rock storage cells.

(b) Quarry Expansion Constraints and Alternatives

Alternatives for the quarry expansion are limited by the extent of ore bearing reserves (**Figure 2**) that were defined during exploration activities. Currently, fixed infrastructure (e.g., mill, maintenance garage, conveyer, etc.) limits expansion of the quarry to the northwest. Brown Brook limits expansion alternatives to the west. State lands to the north limit expansion in a northerly direction beyond what is proposed in this application. Exploration activities indicate that ore-bearing reserves exist at depth, below the currently permitted vertical excavation limit, and to the south of the currently permitted excavation limit. Quarry deepening and expansion, marginally to the north and to the south, are the only alternatives for extending the life of the operation from an ore recovery perspective. In light of these findings, Barton developed an optimal mine plan that is the basis of this requested permit modification.

Prior to selecting the mining plan that is the subject of this permit modification, Barton considered other alternatives but found them to be suboptimal for environmental impacts (i.e., meaning those options would cause greater environmental impacts), and/or from an ore recovery perspective. These alternatives are discussed below.

Alternative #1: In this alternative, the quarry is deepened but expanded marginally only to the north (same distance and configuration as the northern expansion in the proposed permit modification). In this scenario, mining would not occur to the south, and RM placement of fine- and coarse-grained materials would occur in a similar fashion as in the proposed permit modification.

#1 Conclusion: With this mine plan, the lateral footprint of the RM Facility would remain as proposed. This mine plan, however, would result in a loss of 30 years of reserves and a reduction of the proposed RM Facility height from 2,375 feet to 2,325 feet amsl, (i.e., 30-foot difference from the ultimate elevation of the proposed configuration) due to an overall lower quantity of RM generation. A loss of 30 years of

reserves equates to an approximately 40% reduction of the LOM from the optimal (proposed) configuration. Barton determined that this substantial loss of reserves was not justified by the minimally reduced visual impact resulting from the height differential. This is particularly so given the lack of any new or sensitive visual receptors from the proposed modification and the ultimate reclamation plan which will result in the RM Facility blending with the surrounding landscape.

Alternative #2: In this alternative, the quarry is deepened and expanded marginally only to the north (same distance and configuration as the northern expansion in the proposed permit modification), and both fine- and coarse-grained RM continue to be placed in the existing RM Facility. In this scenario, mining would not occur to the south, and the placement of all RM in the RM Facility would allow for extended deepening of the quarry.

#2 Conclusion: The impacts of this mine plan would result in (1) a roughly equivalent LOM as compared to the proposed plan, (2) an increase in the lateral footprint of the RM Facility by 35 acres (30% more RM Facility disturbance area than is currently proposed), and (3) a final RM Facility elevation of 2,355 feet amsl (same ultimate elevation as the proposed configuration). The final quarry elevation would be 1,710 feet amsl across the entire footprint, while the quarry elevation under the proposed operation would be 1,720 feet amsl across only a small portion of the quarry. In addition, the RM Facility under this alternative scenario would be visible from the entirety of Thirteenth Lake, require the relocation of two stream channels (totaling 0.75 mile in length), require the installation of multiple surface water impoundments, and require the installation of pumping and water handling infrastructure at multiple locations across the property. These modifications would add significant technical, financial, and risk-related challenges to the operation, as well as additional significant environmental impacts (e.g., land disturbance, dust, visual, surface water, etc.). Given the enhanced adverse environmental impacts resulting from this mine plan, Barton rejected this alternative.

(c) Preferred Alternative

Based on Barton's comprehensive analysis that evaluated the interrelationships among ore quality, RM generation,excavation sequencing, geotechnical constraints, water use, topographic limits, visual impacts, economics,trucking, and engineering controls and risks, Barton concluded that a long-term mine plan that incorporates fine-grained RM storage within the quarry through strategic excavation and planning, as well as a moderately expanded coarse-grained RM Facility and quarry operation, offers the best solution for extending the life of Barton's operation at the Site while also minimizing environmental and community impacts to the maximum extent practicable over the entire LOM..

5.0 PROPOSED MODIFICATIONS

Based on the analysis and alternatives discussed above, the optimal option for Barton moving forward is as set forth in the proposed permit modification application. As discussed below, the proposed modifications minimize all environmental impacts while extending the life of the operation as long as possible at this location.

5.1 Quarry and RM Facility Expansion

The proposed modification includes adding 58.6 acres to the LOM area. The excavationarea will be stepped with the surrounding topography with decreasing pit elevations from north to south toaccommodate ore grade, excavation planning, logistics, and fine-grained RM storage. The proposed deepest portion of the excavation will be 1,720 feet amsl in the southern portion of the quarry, associated with Phase 4 mineral extraction. All regions of the proposed quarry reside inside the NYSDEC set back limits of 25-foot property line offset plus 1.25H:1V slope for hard-rock quarries.

Barton's long-term plan is to store all fine-grained RM within the confines of the quarry while expanding the coarse-grained RM Facility, both laterally and vertically. To achieve this, Barton will strategically extract ore to create areas within the quarry capable of providing lateral containment for fine-grained RM and reclaim excavated regions of the quarry. In other words, the long-term RM strategy is for the majority of coarse-grained RM to be deposited in the RM Facility and all fine-grained RM to be used to backfill the quarry excavation. In Phase 4 of the operation and once the proposed maximum RM Facility height of 2,375 ft amsl is achieved, backfilling of the containment cells with coarse-grained RM from the RM Facility will proceed. This will allow Barton to reduce the final overall height of the RM Facility to 2,355 feet amsl, minimize the lateral extent of the RM Facility, and optimize the use of the excavation area by reusing it as a containment cell. All of these activities are key components of Barton's reclamation plans. As these reclamation activities will occur concurrently with mining operations, this integrated plan will reduce mining-related impacts to the maximum extent practicable as the various stages of mining proceed.

Under the currently permitted conditions, Barton has approximately five years of fine-grained RM storage remaining. By extracting ore in a strategic manner over this same period, as proposed in the permit modification request, Barton will be able to generate enough fine-grained RM storage capacity for approximately 40 to 50 years. This will allow Barton to extract ore from the northern regions of the quarry

(Pit 2) and subsequently generate enough storagecapacity to handle fine-grained RM generation for the remainder of the LOM.

5.2 Quarry Rock Crushing, Screening, and Plant Feed Stockpile

No changes are proposed for operations and the production rates of rock crushing and processing, which will continue as currently permitted. The ore will continue to be transported to the on-site primary crusher via haul trucks and either stockpiled temporarily or conveyed to the mill for further processing.

5.3 Quarry Internal Haul Roads

Internal haul roads within the Site will be modified as the mine plan advances to provide safe and compliant access to variouslocations throughout the operation. The design, construction, and maintenance of the haul roads is a function of Mine Safety and Health Administration (MSHA) standards and the equipment being deployed. In general, active haul roads throughout the Site are 100 feet wide, exist at a ten percent grade, protected from vehicle roll-over accidents (berms), and are compliant with stormwater conveyancerequirements. Haul roads associated with the proposed modification will be developed, as necessary, to these standards and will be typically used for moving equipment and mined or crushed rock within the limits of the affected area. Water will be applied as necessary to inhibit excessive airborne dust.

5.4 Quarry Equipment and Facilities

No changes to the type of equipment are proposed for the quarry portion of this project. No new or permanent building construction is proposed at this time or is anticipated for the foreseeable future.

6.0 PROPOSED LIFE OF MINE SEQUENCE

Barton has developed a phased mine plan that depicts the series of major excavations and RM storage area developments over the life of the operation. This is consistent with long-standing NYSDEC policy to require an evaluation of the entire LOM, with all phases of development, to mitigate adverse environmental impacts to the maximum extent practicable consistent with the mandates and objectives of the Mind Land Reclamation Law (Environmental Conservation Law, Article 27, title 27) and the State Environmental Review Act (Environmental Conservation Law, Article 8). In addition, during pre-application discussions, the NYSDEC conveyed the importance of understanding the phases of development relative to visual impacts, RM placement strategy, and reclamation activities. Figure 2 below presents the timing of the mining phases and RM Facility development to accomplish these goals and objectives.

To develop the timeline, Barton made several key assumptions that, to a large extent, are beyond its control. The potential variability in the assumptions will not impact any proposed mitigation strategies, but, rather, could impact only the potential timing of the proposed phasing. These assumptions include:

- Sales of garnet – Projected sales are based upon historic sales and future market projections. While the existing crushing and processing infrastructure restricts the rate of mining and mineral processing, market conditions could slow the rate of sales and subsequently mining activities. This would impact the rate of excavation and growth of the RM Facility as well as the volume of trucks needed to meet the market demand. As noted previously, garnet produced here is a global commodity; therefore, production rates can be impacted by operations, sales and new market developments well outside of any influence of Barton.

- Sales of RM – RM sales are progressing and anticipated to grow as Barton develops new markets for this mineral resource. The RM sales will impact the rate of growth of the RM Facility and the volume of trucks needed to meet the market demand. For the purposes of this application and the mine plan design, it was assumed that 25,000 cubic yards of coarse-grained RM will be sold beginning in 2026.

- Ore quality and variability -- The percent of ore that is a marketable product is naturally variable within the geologic deposit and varies laterally and vertically throughout the excavation area. The variability will impact the rate of mining. All other things being equal, better-quality ore equals slower rate of mining, and poorer quality ore equals a faster rate of mining (up to maximum capacity). Additionally, the poorer-quality ore accelerates the rate of growth of the RM Facility, and better-quality ore decreases the rate of growth of the RM Facility.

The components and timing of each mine plan phase are in Figure 2 below:

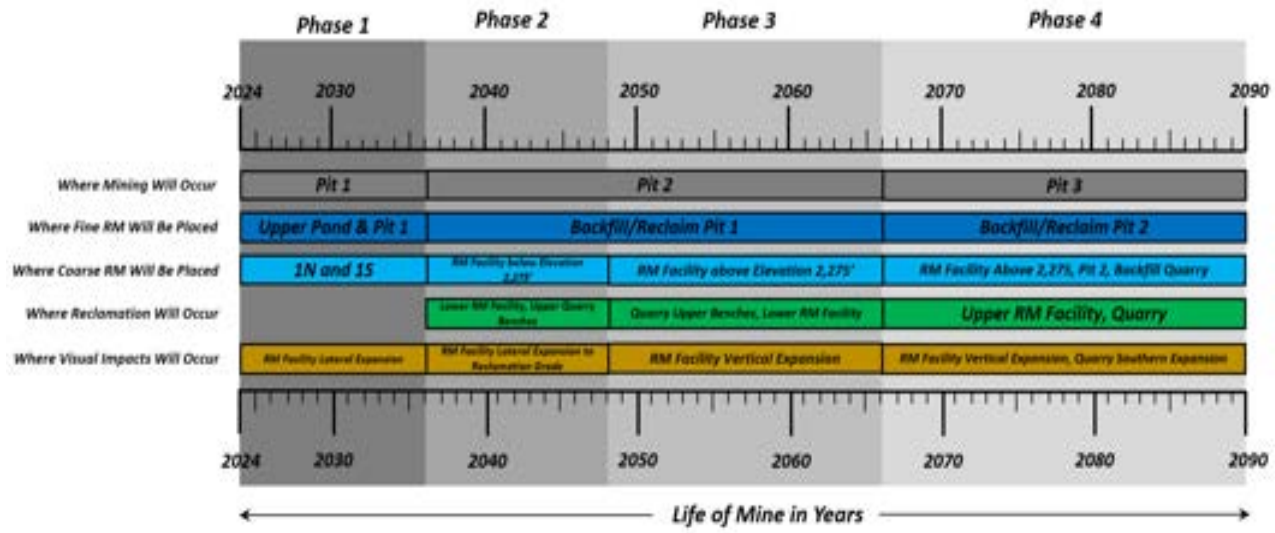


Figure 2. Life of Mine Phases (no unpermitted mining activities will occur during any phase of operation)

Table 2 further outlines the proposed phase timing and adds estimated quantities of RM to be deposited in the RM Facility.

Table 2: Mine Plan Phase Timing and Quantities

Phase	*Year Begin*	*Year End*	*Duration Years*	*Max Height of RM Pile * Feet AMSL*	*RM Pile Foot Print ** Acres*	*Quantity of RM Deposited In Pile *** Million Cubic Yards*	*Fine Grained RM Disposal Activities*	*Reclamation Activities *****
Phase 1	2023	2036	13	2,175	88.4	3.1	Upper Pond, and Phase 1 Pit	None
Phase 2	2037	2048	11	2,175	112.0	2.4	Phase 1 Pit	Upper Quarry Benches, Lower RM Pile
Phase 3	2049	2066	17	2,325	128.2	3.6	Phase 1 Pit	Upper Quarry Benches, Middle RM Pile
Phase 4	2067	2090	23	2,375	128.2	2.8	Phase 2 Pit	Remaining Quarry and RM Pile
After Phase 4 ****				2,355	128.2	-1.0		Phase 4 Pit Backfill Area

Notes:
* The maximum height of the RM pile at the end of the Phase
** The total footprint of the RM pile at the end of the Phase
*** Quantity of RM (fine+coarse) deposited in the RM pile during the Phase
**** Barton to backfill Phase 4 pit with RM material from RM pile
***** See Narrative figures for specific reclamation areas

The following phased mine plan narrative details the sequence and activities necessary to execute the proposed plan for the entire 67-year LOM.

6.1 Phase 1 (Present to 2036)

During Phase 1, Barton will initially extract ore within the currently permitted excavation limits and place RM within the currently permitted RM Facility. Once this permit modification application has been approved, Barton will deepen the quarry floor to elevation 1,810 feet amsl, expand the quarry to the north and expand the RM Facility to the south. During this time period, Barton will also install a series of access roads, stormwater conveyance ditches, and sediment ponds.

6.1.1 Clearing and Grubbing

Clearing and grubbing activities during Phase 1 will be limited to those associated with the RM Facility expansion to the south and quarry expansion to the north, as indicated in Figure 2. Barton will incrementally clear the trees and vegetation within the expansion areas during annual campaigns. The quantity of annual clearing will be based on the quantity of coarse-grained RM that is anticipated to be deposited in the RM Facility during that time frame, consistent with federal and state guidelines. All topsoil materials within the cleared areas will be excavated and stockpiled separately on the Site for use during reclamation activities. Temporary erosion and sediment control measures will be utilized during clearing and grubbing activities if permanent measures are not in place and fully operational.

6.1.2 Ore Extraction

During Phase 1, mining ore will be extracted from the footprint identified in Figure 3 and Figure 6. The lowest elevation of the quarry after the completion of Phase 1 mining will be elevation 1,790 feet amsl.

6.1.3 RM Storage

During the first five years of mining under Phase 1 activities, coarse-grained RM will be placed in the northern RM Facility, labeled Storage facility-1-N and located within the currently permitted RM Facility footprint. Coarse-grained RM within Storage facility-1-N will reach the permitted elevation of 2,275 feet amsl. Once this permit modification has been approved, Barton will expand the RM Facility to the south and begin placing coarse-grained RM in Storage facility-1-S.

Fine-grained RM will be placed into the existing ponds indicated in Figure 2. These materials will later be dredged and placed into the quarry containment cells prior to vertical expansion of the RM Facility beyond its currently permitted height.

6.1.4 Mining Support Activities

Access to the RM Facility will be developed through a series of roads as shown in Figure 2 and Figure 6. All RM Facility access roads will have stormwater drainage ditches on both the inside and outside of the roadway to collect stormwater runoff from the access road, cleared areas, and RM Facility. Stormwater from these areas will be conveyed to sediment basins for treatment prior to discharge.

As previously mentioned, RM are hydraulically placed. Internal drainage from the RM Facility, during all phases of mining, will be captured by a series of underdrains and conveyed to ponds that are separate from the stormwater management system, forming a closed-loop system. This water is continuously reused during the tailings' placement and beneficiation process. Discharges from these ponds are infrequent and occur only during significant weather events, and such discharges are covered under Barton's SPDES permit, NY0034959.No modifications to this permit are planned.

Stormwater management for the RM Facility and access roads during Phase 1 will be provided by a series of drainage channels and sediment basins and are covered within the updated SWPPP located in **Appendix G**. It is anticipated that three new sediment basins and outfalls will be constructed during Phase 1. All proposed modifications to Barton's MSGP (GP-0-17-004), permit identification number NYR00F623, are identified in the updated SWPPP located in **Appendix G**. All other areas of the operation will function under the currently approved SWPPP and MSGP.

Improvements will be made to the primary entrance of the Barton property from Thirteenth Lake Road during Phase 1. These improvements will consist of:

1. Regrading the entrance roadway to promote drainage to an improved roadside stormwater drainage conveyance channel that will be located on the east side of the access road.

2. Constructing a new sediment basin at the location indicated on Figure 2 and within the updated SWPPP to capture and treat runoff from the entrance road.

6.1.5 Reclamation Activities

Major reclamation activities are not planned during Phase 1.

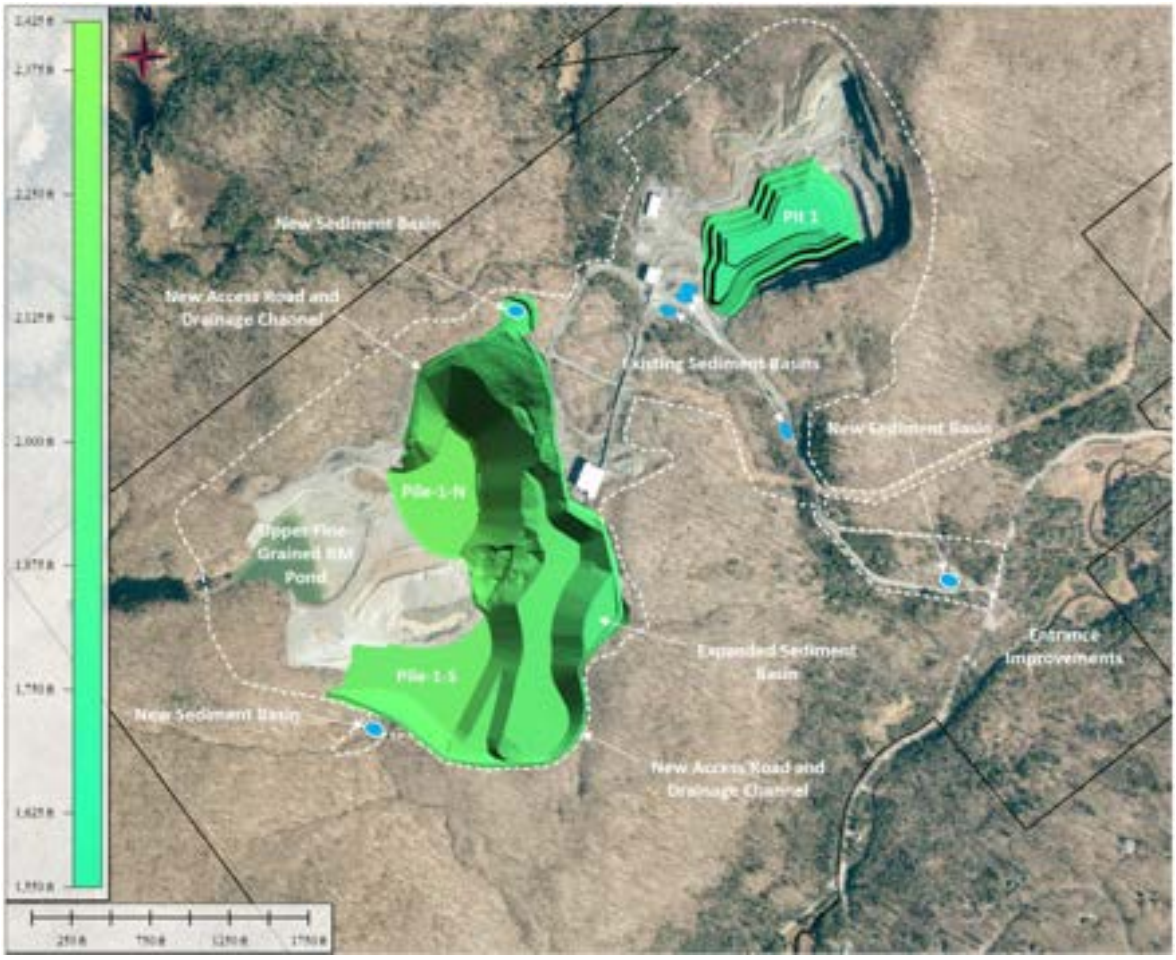


Figure 3. End of Phase 1 Mining

6.2 Phase 2 (2037 to 2048)

During Phase 2 mining, Barton will expand the quarry to the north and move the eastern highwall to near final wall configuration. Along the eastern highwall, a ramp and access road will be left in place to access reserves in Phase 4. Coarse-grained RM will be placed in 100-foot lifts within the RM Facility footprint and reach elevation 2,275 feet amsl. As part of reclamation during Phase 2, fine-grained RM will be utilized to reclaim excavated regions of ore created during Phase 1. During this period, Barton will also be extending roads to access the top of the RM Facility and adding a sedimentation basin to manage additional stormwater generated by expanding the lateral extent of the quarry.

6.2.1 Clearing and Grubbing

Clearing and grubbing activities during Phase 2 will be associated with the RM Facility expansion to the north. Barton will incrementally clear the trees and vegetation within expansion areas during annual

campaigns based on short-term mine planning needs. All topsoil materials within the cleared areas will be excavated and stockpiled separately on the Site for use during reclamation activities. Temporary erosion and sediment control measures will be utilized during clearing and grubbing activities if permanent measures are not in place and fully operational.

6.2.2 Ore Extraction

During Phase 2 of mining, ore will be extracted from the footprint identified in Figure 4 and Figure 7. At the end of Phase 2, the quarry floor in the northern expansion area will be approximately at elevation 1,950 feet amsl.

6.2.3 RM Storage

During Phase 2, coarse-grained RM will be placed in the RM Facility as depicted in Figure 3. This represents a lateral expansion of what is currently Storage facility-2-N and a lateral and vertical expansion of what is currently Storage facility-2-S (both of which are components of the proposed RM Facility). RM placement during this time frame will commence in 100-foot lifts to reach elevation 2,275 feet amsl. Coarse-grained RM will be placed from the cyclone unit and then graded in place in 100-foot lifts to achieve reclamation grades for revegetation (2:1 side slopes). A 30-foot-wide catch bench will be left after every 100-foot vertical lift to maintain access to the RM Facility face as well as assist with reclamation activities, maintenance, and stormwater control. Final lateral storage facility configuration (reclamation grade) will be reached within both Storage facility-2-N and Storage facility-2-S by the end of Phase 2. Barton will begin concurrent revegetation-related reclamation once each 100-foot lift has been finalized. Those reclamation activities consist of preparing side slope areas for revegetation in accordance with the procedures and methods set forth in the Reclamation Plan.

Fine-grained RM will be utilized to reclaim the excavated regions of the quarry created during Phase1.

6.2.4 Mining Support Activities

Access to the RM Facility will be extended from roads developed during Phase 1 as shown on Figure 3 and Figure 7. All RM Facility access roads will have stormwater drainage ditches on both the inside and outside of the roadway to collect stormwater runoff from the access road, cleared areas and RM Facility and conveyedto sediment basins for treatment prior to discharge.

Internal drainage from the RM Facility, during all phases of mining, will be captured by a series of underdrainsand conveyed to ponds that are separate from the stormwater management system, forming a closed-loop system.

Stormwater management for the RM Facility during Phase 2 mining activities will be achieved by a series of drainage channels and sediment basins as shown on Figure 3 and within the updated SWPPP located in **Appendix G**. All proposed modifications to Barton's MSGP (GP-0-17-004), permit identification number NYR00F623, are identified in the updated SWPPP located in **Appendix G**. All other areas of the operation will function under the currently approved SWPPP and MSGP.

6.2.5 Reclamation Activities

As previously indicated, Barton's reclamation activities on the Site during Phase 2, which will occur concurrently with its mining operation, consist of two categories of activities: (1) utilizing mined out quarry excavations (from Phase 1 mining) for permanent placement of fine-grained RM; and (2) revegetating the slopes of the RM Facility, together with reclaiming the upper benches in the quarry.

More specifically as to the latter, Barton will perform concurrent reclamation on the slopes of the coarse-grained RM Facility that have reached reclamation grade during Phase 2 as indicated in Figure 4 and Figure 11. In addition, the upperbenches in the quarry, above the Phase 4 access ramp, will be reclaimed.

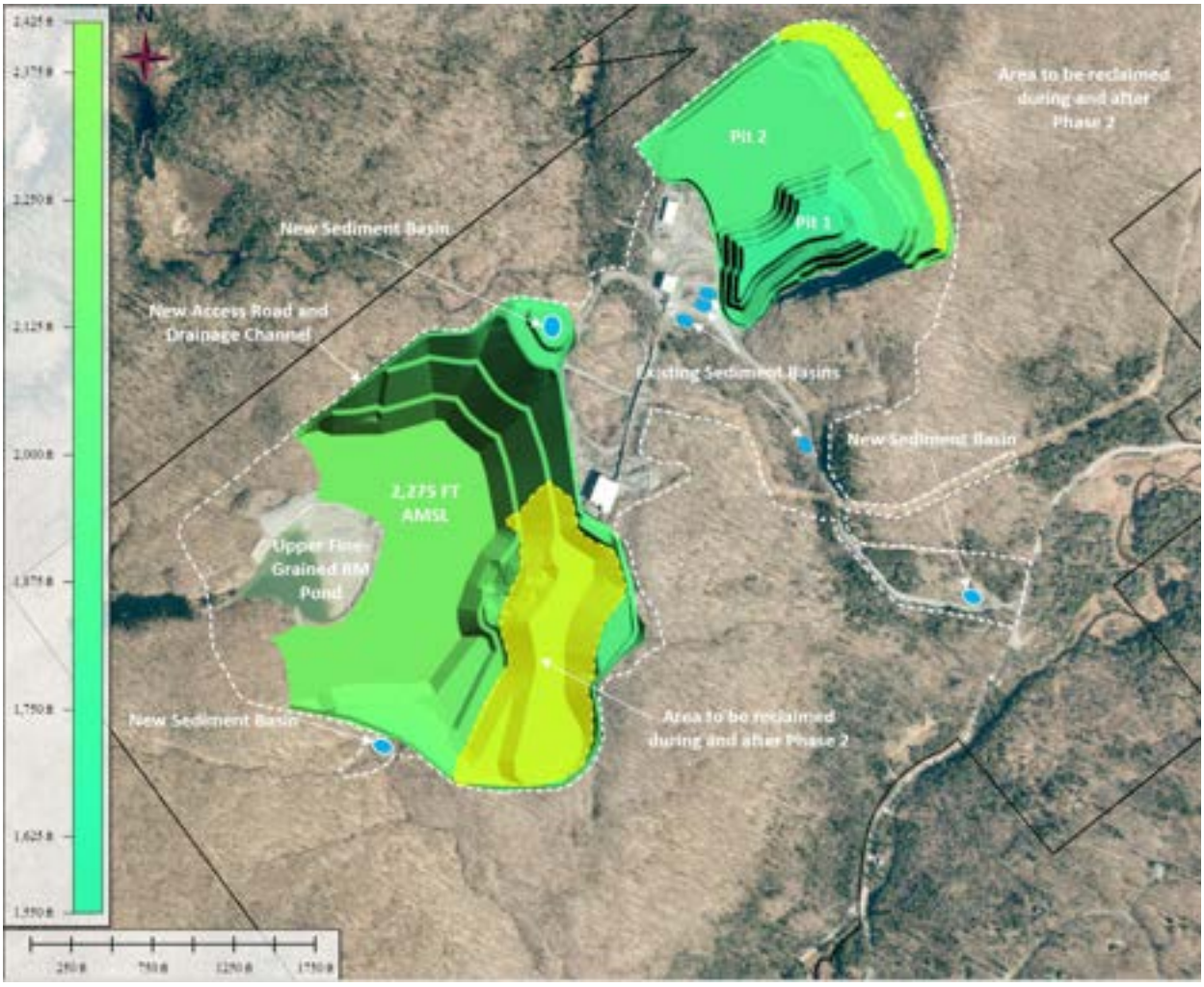


Figure 4. End of Phase 2 Mining

6.3 Phase 3 (2049 to 2066)

During Phase 3 mining, Barton will deepen the quarry from elevation 1,950 feet amsl to 1,820 feet amsl. Coarse-grained RM will be placed in the RM Facility above elevation 2,275 feet amsl, as depicted in Figure 4. Fine-grained RM will be permanently stored in the region of ore excavation created during Phase 1. During this time period, Barton will also be extending roads to access the top of the RM Facility and adding a sedimentation basin to manage additional stormwater associated with the RM Facility expansion.

6.3.1 Clearing and Grubbing

Clearing and grubbing activities during Phase 3 will be associated with the RM Facility expansion to the west. No clearing or grubbing is anticipated around the mineral extraction operation. Barton will incrementally clear the trees and vegetation within expansion areas during annual campaigns based on

short-term mine planning needs. All topsoil materials within the cleared areas will be excavated and stockpiled separately on the Site for use duringreclamation activities. Temporary erosion and sediment control measures will be utilized during clearing and grubbing activities if permanent measures are not in place and fully operational.

6.3.2 Ore Extraction

During Phase 3, ore will be extracted from the footprint identified in Figure 5 and Figure 8. At the end of Phase 3, the quarry floor in the northern expansion area will be approximately at elevation 1,820 feet amsl.

6.3.3 RM Storage

During Phase 3, coarse-grained RM will be placed in the RM Facility as depicted in Figure 5. This represents a vertical expansion of the RM Facility. RM placement during this time frame will commence in 100-foot lifts tocreate the final reclamation grades shown on the reclamation plan. Coarse-grained RM will be placed fromthe cyclone unit and then graded in place in 100-foot lifts, utilizing mobile equipment, to achieve reclamationgrades (2:1 side slopes). A 30-foot-wide catch bench will be left after every 100-foot vertical lift to maintain access to the RM Facility face as well as assist with reclamation activities, maintenance, and stormwater control. Barton will begin concurrent reclamation, as specified in the reclamation plan, once each 100-foot lift has been finalized. To further clarify, after RM materials have reached the final reclamation grade and benches have been established, then, revegetation-related reclamation activities will proceed.

Fine-grained RM will be permanently stored in the region of ore excavation created during Phase 1.

6.3.4 Mining Support Activities

Access to the RM Facility will be extended from roads developed during Phase 3 as shown in Figure 5 and Figure 8. All RM Facility access roads will have stormwater drainage ditches on both the inside and outside of the roadway to collect stormwater runoff from the access road, cleared areas and RM Facility and conveyedto sediment basins for treatment prior to discharge.

Internal drainage from the RM Facility, during all phases of mining, will be captured by a series of underdrainsand conveyed to ponds that are separate from the stormwater management system, forming a closed-loop system. This water is continuously reused during the RM placement and beneficiation process.

Discharges from these ponds are infrequent and occur only during significant weather events, and such discharges are covered under SPDES permit, NY0034959.

Stormwater management for the RM Facility during Phase 3 mining activities will be achieved by a series of drainage channels and sediment basins as shown on Figure 4 and within the updated SWPPP located in **Appendix G**. All proposed modifications to MSGP (GP-0-17-004), permit identification number NYR00F623, are identified in the updated SWPPP locatedin **Appendix G**. All other areas of the operation will function under the currently approved SWPPP and MSGP.

6.3.5 Reclamation Activities

As previously indicated, Barton's reclamation activities on the Site during Phase 3, which will occur concurrently with its mining operation, consist of two categories of activities: (1) utilizing mined out quarry excavations (from Phase 1 mining) for permanent placement of fine-grained RM; and (2) revegetation/reclamation of the northern highwall and the slopes of the RM Facility.

More specifically as to the latter, during Phase 3, Barton will reclaim the portions of the northern highwall and RM Facility as indicated on Figure 4 and Figure 12.

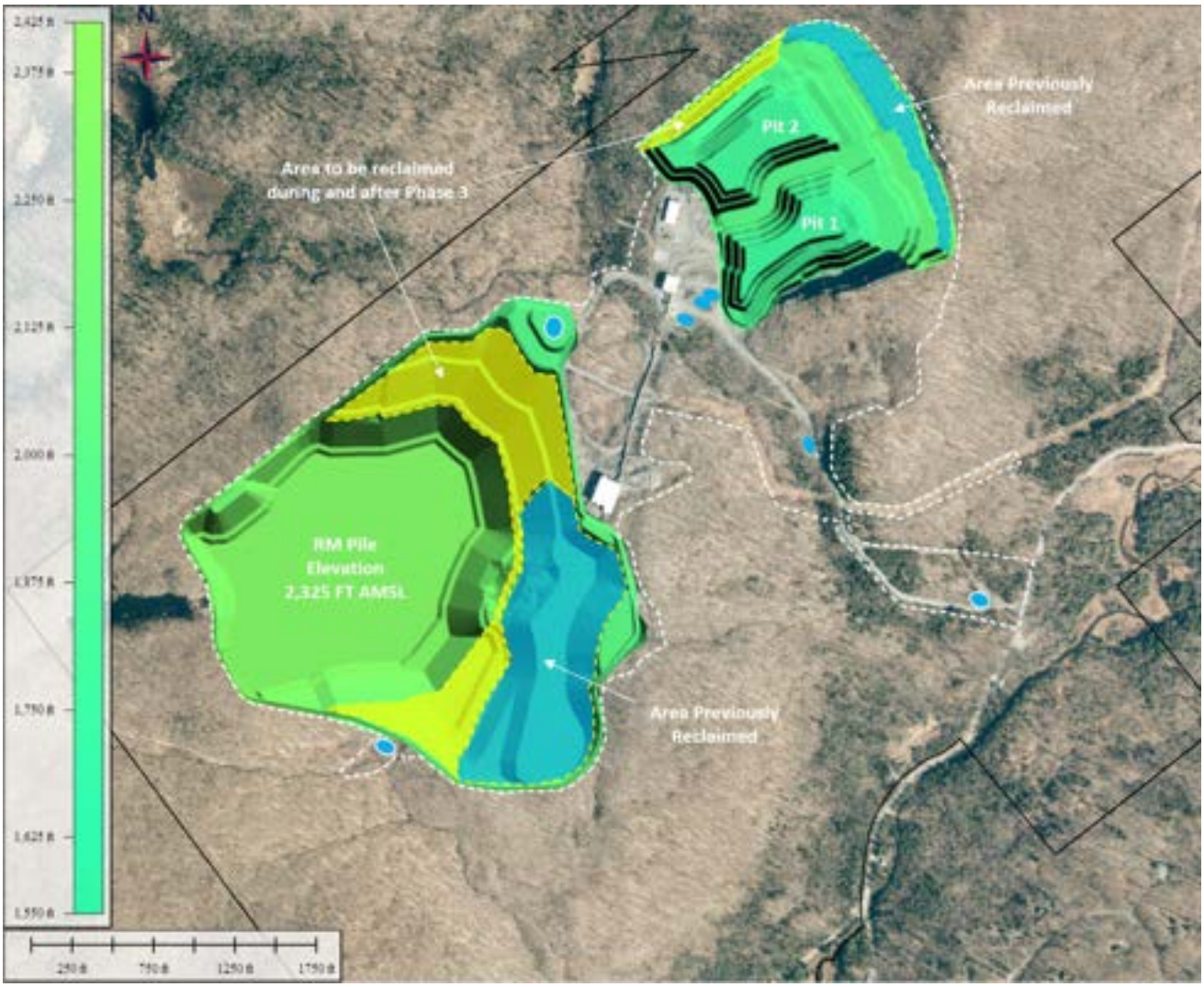


Figure 5. End of Phase 3 Mining

6.4 Phase 4 (2067 to 2090)

Phase 4 represents the final stages of mining at the Site. During Phase 4 of mining, Barton will expand the quarry to the south and deepen the floor to elevation 1,720 feet amsl. Coarse-grained RM will be placed in the RM Facility until the proposed final height of elevation 2,375 feet amsl has been reached. At this point, both fine- and coarse-grained RM will be placed in the quarry with fine-grained RM going into Pit #2 and coarse-grained RM backfilling over the top of Pit #1 and Pit #2.

6.4.1 Clearing and Grubbing

Clearing and grubbing activities during Phase 4 will be associated with the southern expansion of the quarry. No clearing or grubbing is associated with the RM Facility during Phase 4. Barton will incrementally

clear the trees and vegetation within the quarry expansion areas during annual campaigns based on short term mine planning needs. All topsoil materials within the cleared areas will be excavated and stockpiled separatelyon the Site for use during reclamation activities. Temporary erosion and sediment control measures will be utilized during clearing and grubbing activities if permanent measures are not in place and fully operational.

6.4.2 Ore Extraction

During Phase 4, ore will be extracted from the footprint identified in Figure 6 and Figure 9. At the endof Phase 4, the quarry floor in the southern expansion will be approximately 1,720 feet amsl.

6.4.3 RM Storage

During Phase 4, coarse-grained RM will be placed in the RM Facility until the final elevation of 2,375 feet is reached. This representsa vertical expansion of the RM Facility. RM placement during this time frame will commence in 100-ft lifts tocreate the final reclamation grades shown on the reclamation plan. Once elevation 2,375 feet amsl has been reached, reclamation activities will begin, and the RM placement operation will move to the previously excavated portions of the quarry (Pit #1 and Pit #2). It is anticipated that this will be approximately year 2083. Fine-grained RM will be permanently stored in the region of ore excavation created during Phase 3 (Pit #2). Coarse-grained RM will be placed over the top of fine-grained storage in Pit #1, as depicted in Figure 5 and Figure 9.

6.4.4 Mining Support Activities

Internal drainage from the RM Facility, during all phases of mining, will be captured by a series of underdrainsand conveyed to ponds that are separate from the stormwater management system, forming a closed-loop system. This water is continuously reused during the RM placement and beneficiation process. Dischargesfrom these ponds are infrequent and occur only during significant weather events, and such discharges are covered under SPDES permit, NY0034959.

Stormwater management during Phase 4 will be as shown within the updated SWPPP located in **Appendix G.**

6.4.5 Reclamation Activities

As previously indicated, Barton's reclamation activities on the Site during Phase 4, which will occur

concurrently with its mining operation, consist of two categories of activities: (1) utilizing mined out quarry excavations (from Phase 3 mining) for permanent placement of fine-grained RM, topped with coarse-grained RM; and (2) revegetating the slopes of the RM Facility, together with reclaiming all areas of the quarry. More specifically as to the latter, during Phase 4, final reclamation will be performed on the upper portions of the RM Facility and in all areas of the quarry once ore extraction has been completed. As to RM placement in quarry excavations, it is anticipated that RM placement in the region of quarry developed during Phase 3 mining activities will be utilized until the very end of mining in Phase 4.

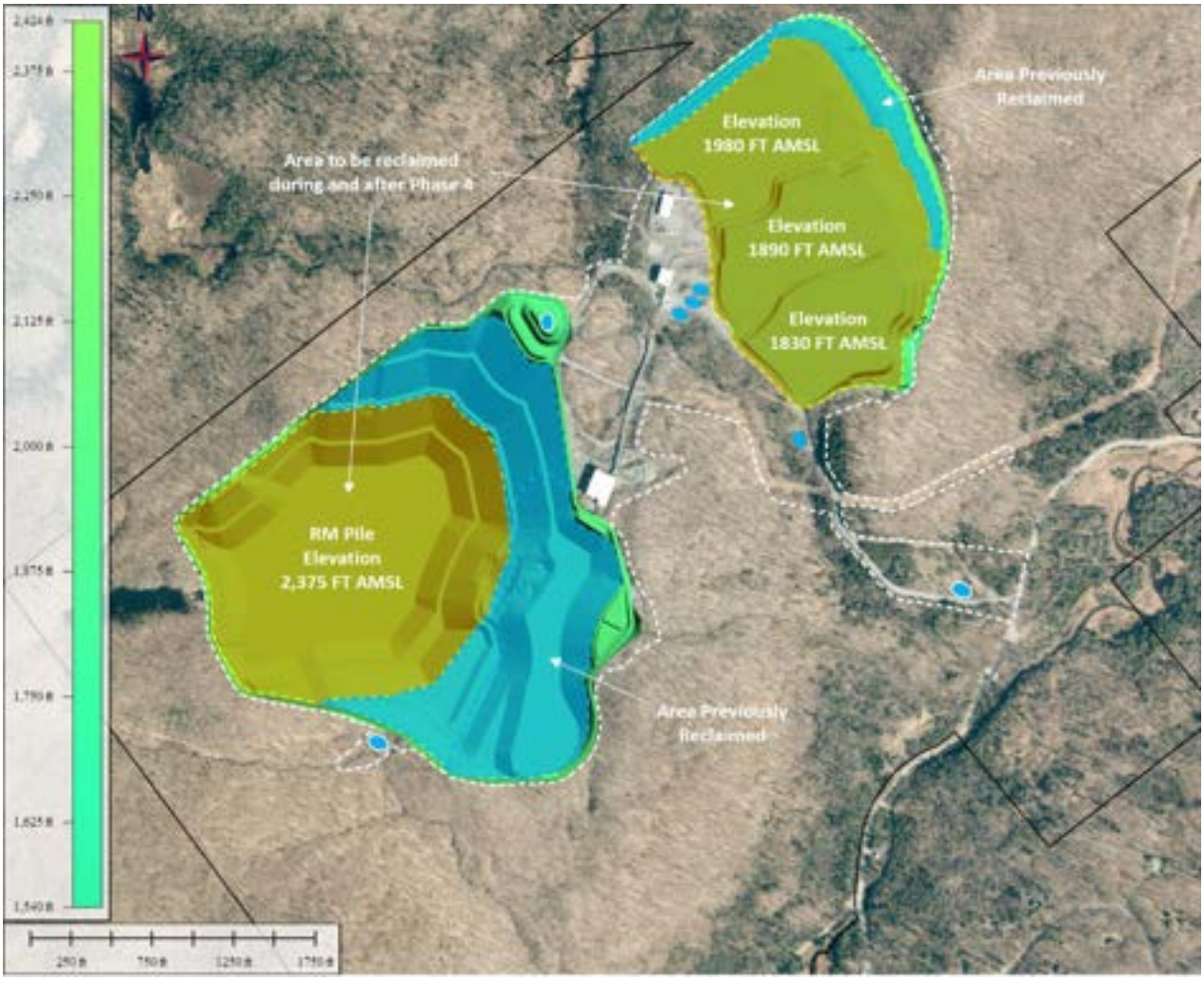


Figure 6. End of Phase 4 Mining

6.5 Operation and Trucking Hours

As part of this permit modification application, Barton is proposing minor modifications to operation and

trucking hours (Table 3) from those currently permitted. Barton is currently permitted to haul off-site Monday to Friday from 7 am to 10 pm. Barton is offering to **reduce** these hours to 7 am to 5 pm. Barton is also requesting to modify the supplier vehicle hours to Monday to Friday 7 am to 5 pm. Barton is also permitted to perform quarry mining activities Monday to Friday from 7:00 am to 3:30 pm. To provide more flexibility to manage quarry operations during adverse weather conditions, Barton is requesting that the quarry operating hours be extended to 7:00 am to 4:30 pm, Monday to Friday.

Table 3: Proposed Hours of Operation Summary

Activity	Blasting	Quarry Mining	Mineral Processing (Crushing and Concentrating)	Off Site Hauling	Supplier Vehicle
Days	Monday-Saturday	Monday-Friday	Monday-Sunday	Monday-Friday	Monday-Friday
Hours	9:00am - 4:00pm	7:00am - 4:30pm	24 hrs.	7:00am-5:00pm	7:00am-5:00pm
Notes	Blasting not permitted on legal holidays or under atmospheric inversions, unless such conditions have persisted for at least 72 hours	Includes all mining activities such as; drilling, rock-breaking, shoveling, adding to stockpiles, and hauling	1) Residual minerals placement, 2) Repair and maintenance activities, site development, and reclamation activities, and 3) Daytime feeding from adjacent stockpile.	Emergency exceptions include, but not limited to; breakdown of haul truck, adverse weather impacting Thirteenth Lake Road conditions, and Ruby Mountain finished garnet storage capacity. Hours extended to 7 pm (M-F), and 7am to 4pm Saturday, under these exceptions.	Supplier vehicles will include, but not be limited to; deliveries, supplies, equipment rentals and garnet recycling. Exceptions to this time and day limitation would be to accommodate emergency deliveries.

7.0 ENVIRONMENTAL IMPACTS

Unlike many development projects, this mining operation (including the modifications described herein) willoccur over many decades. That is, although there will be an expansion of the size of the quarry and RM Facility, these changes will evolve gradually over many years. Moreover, because the rate of these expansions will be relatively slow, it provides an opportunity for Barton to mitigate potential impacts as these features develop. Ultimately, the Site will be reclaimed back to a natural state as has occurred on the original Barton Mine, located on Gore Mountain, now a tourist attraction.

Within the project footprint, Barton has identified the following potential environmental impacts and proposed mitigative measures. As shown in the LOM plan, the proposed permit modification involves an expansion of the quarry and RM Facility to the north and south, as well as deepening of the quarry. The potential environmental impacts addressed in this application and detailed below concern the following

technical issues:

- Visibility
- Dust
- Groundwater
- Surface Water
- Noise
- Additional Trucking
- RM Facility Stability
- Threatened and Endangered Species
- State Historic Preservation (SHPO)
- Critical Environmental Area

7.1 Visual

To support this permit modification request, Barton is required to perform a visual impact assessment to determine the visual impact of proposed Site modifications to the surrounding community. The detailed Visual Impact Assessment is attached to this narrative in **Appendix O**. Barton presented the proposed Site modifications to the APA and NYSDEC and worked with their technical staffs to develop a scope of work for this assessment.

Barton also followed the prescribed agency methodology (*DEC DEP-00-2 I Assessing and Mitigating Visual and Aesthetic Impacts 12/13/2019 / APA- Visual Analysis Methodology, rev: 12/7/15*) and accounted for comments/requests from the regulatory agencies when performing the assessment. Thus, the attached Visual Impact Assessment (**Appendix** O**)** provides a detailed visual assessment of the project for the entire LOM (through year 67 and closure/reclamation of the Site) that complies with all agency guidance and directives.

For the Visual Impact Assessment, 16 potential receptors within a five-mile radius of the proposed project were identified by Barton and approved by the APA and NYSDEC prior to performing the field work component of the assessment. Barton performed the field work for the Visual Impact Assessment in December of 2020, during leaf-off, high-contrast conditions. Photographs were retaken along Thirteenth Lake Road and Gore Mountain in April of 2024 and at a new location on Hooper Mine Trail. Eight weather balloons were flown at surveyed locations for horizontal position and vertical elevation representing the proposed RM Facility configuration. Photographs were taken from receptor locations identified during the

scoping sessions with the APA and NYSDEC to evaluate the extent (if any) to which the proposed Site modifications would be visible from each location.

Of the 16 identified receptor locations, the current RM Facility was visible at only five locations, and the quarry was visible at only one location. This will not change during or following implementation of the proposed modifications. In other words, only areas already visually impacted by the currently permitted RM Facility will be able to see the project as modified. No new locations will be visually impacted by the project.

Despite that no new locations will be visually impacted by the project, Barton, nonetheless, identified and incorporated mitigative measures into the proposed Permit Modification Mine Plan. These measures include delayed expansion and concurrent reclamation to reduce the visual and aesthetic impact of the RM Facility expansion to those five locations from which the Facility is visible. Additionally, at the end of the Site's LOM, the Site will be reclaimed/revegetated to match the surrounding natural aesthetic, thereby effectively eliminating public receptor visual impact. A photographic simulation of the proposed reclaimed configuration of the RM Facility from Thirteenth Lake Road is shown below. Accordingly, there will be no significant visual impacts from the proposed permit modification.

Photographic simulation of reclaimed RM Facility at the end of the Life of Mine

7.2 Dust

As is the case today, the expanded RM Facility will have the potential for dust generation under unique conditions (i.e., high winds during extended dry periods). The majority of fine-grained RM is placed in the upper pond; however, a small amount ends up in the RM Facility as particles attached to coarse-grained RM during cyclone separation, and these materials are susceptible to becoming wind borne under specific weather conditions, that is, when the particles are not wet, not frozen and subject to windy conditions (+/- 5mph or greater).

Dust impacts will be mitigated by:

- Concurrent reclamation of side slopes and catch benches that have reached final configuration. Established vegetation will act as a windbreak, preventing dust migration from active (unreclaimed) portions of the RM Facility.

- Temporary vegetative cover (hydroseeding) on the top portions of the RM Facility that have not reached final configuration but will not be active in the near future.

- Annual placement of a biodegradable treatment to non-reclaimed RM Facility faces that has been proven in test applications to harden and capture finer particles and, thus, drastically reduce the potential for fugitive dust.

- Application of water to roads and storage facilities.

- Installation of monitoring equipment to track weather and atmospheric conditions for the purpose of identifying unfavorable conditions and guiding implementation of mitigative measures discussed above.

Barton is actively reducing the unvegetated/uncovered portion of the RM Facility using temporary cover on the top and inactive faces of the RM Facility. The current RM Facility has ~30 acres of exposed side slopes with much of the top surface temporarily covered.

The largest area of exposed RM will occur in Phase 1 of mining with ~45 acres of exposed side slopes. Phase 2 through final reclamation of the RM Facility will have a maximum of 10 to 15 acres of exposed

side slopes at one time.

Establishing temporary cover across the top of the RM Facility and strategically on active side slopes, combined with concurrent reclamation, will reduce the exposed RM acreage by approximately 30 percent in later phases of mining. No potentially significant environmental impacts related to off-Site dust migration are anticipated by the vertical or lateral expansion of the RM Facility when the above mitigative measures are implemented.

7.3 Groundwater

The deepening of the excavation limit from 1,880 feet amsl to 1,720 feet amsl will involve excavation below the surrounding perched, intermittent water table. Characteristic of fractured bedrock surfaces, water doesexist at the upper surface of the bedrock/soil interface. Even at the highest levels of the mine, essentially at the top of Ruby Mountain, precipitation infiltrates into the fractured upper bedrock surface and has, in some areas, impeded downward flow creating isolated groundwater pockets within the bedrock. Where exposed in the quarry face, this water flows into the open pit and over the mine face. There is no continuous, fully saturated aquifer whereby the mine face is wet from the ground surface to the lowest levels of the pit. There are times of the year when no water enters the existing excavation area via this discontinuous groundwater system. Where water does exist in the surrounding bedrock, the gradient fromthe surrounding area into the pit is exceedingly steep as a function of the low permeability of the bedrock. Monitoring well RUB-20-02 is 330 feet from the quarry highwall and recorded a groundwater level 36 feet above the 2,070-foot quarry bench, demonstrating a small radiance of influence with a steep cone of depression.

As is typical of the surrounding bedrock system, a sustainable source of groundwater near the ground surface can be difficult to obtain. Groundwater that does enter the proposed mining operation is expected to be de minimis, and Barton will dewater the pit by installing a small sump and pumping waterfrom the mine and into on-Site stormwater ponds in place of other surface and groundwater sources. Unused water will be discharged to Brown Pond Brook.

The final floor elevation of 1,720 feet amsl is above neighboring residential wells, Thirteenth Lake (elev. 1,675 feet amsl), and Thirteenth Brook (1,600 feet amsl). The proposed excavation will be, at its closest, 330 feet from Brown Pond Brook, and will be below Brown Pond Brook by a maximum of 70 feet. Again, given the relatively impermeable nature of the bedrock, as observed in the mine face and in the surrounding perched water table and monitoring wells, there is no potentially significant impact to Brown

Pond Brook as a function of the proposed modification. Should any water be encountered at the lower levels of the excavation area, water would be returned to Brown Pond Brook via the mine's dewatering system.

7.4 Surface Water and Wetlands

Where the potential existed for the expansion activities to impact water features, Barton evaluated streams and wetlands mapping data and consulted with APA and NYSDEC staff. The streams and wetlands mapping, together with confirmation by APA and NYSDEC staff in the field, confirms that the proposed modification will have no impacts. Barton has designed that will avoid any impacts to any regulated mapped surface water or wetland feature. Moreover, in accordancewith the Warren County Soil and Water District stream setback guidelines, a 100-foot buffer in which vegetation will remain preserved has been incorporated into the plan.

7.5 Sound

7.5.1 Introduction

To support this permit modification request, Barton is required to perform a sound assessment to determine the sound impact of proposed Site modifications to the surrounding community. Specific to the Barton Mines Sound Study, the following aspects of the Permit Modification were analyzed for sound impacts:

- Increase Barton property usage for minerals extraction and storage by 7%, including quarry development activities for approximately two weeks during each phase of the project.
- Increase haulage from the mine Site to account for new RM product sales; and,
- Increase quarry operating hours by one hour.

Barton presented the proposed Site modifications to the APA and NYSDEC and worked with their technical staffs to develop a scope of work for this assessment. This assessment has been performed in accordance with NYSDEC Program Policy, DEP-00-1, *Assessing and Mitigating Noise Impacts* (issued Oct. 6, 2000; revised Feb. 2, 2001).

The objectives of the Permit Modification Sound Study (Sound Study) are:

- *Determine* the projected sound levels and characteristics that will result from the Permit Modification Mine Plan.
- *Assess* potential significant environmental and community impacts for each sound analysis

assessment; and,

- *Identify and implement* sound mitigation measures, where necessary.

The Sound Study is divided into four sound analysis assessments:

- Normal operating conditions during all four phases
- Development activities during all four phases
- One-hour increase in quarry operations
- Increased haul truck trips

Modeled sound levels are presented by mine plan Phase (1-4) and by operating scenarios. Two operating scenarios were analyzed and are defined below:

Normal Operating Conditions: For the RM Facility, normal operating conditions will consist of the RM material grading equipment (bulldozer) in operation. For the quarry, normal operating conditions will include a blast hole drill rig, loading/hauling shot rock, and a hydraulic hammer operating below the quarry highwall.

Development Operating Conditions: For the RM Facility, development conditions will be when grading (bulldozer) activities, or compaction (vibratory roller Phase 1&2 only) activities take place at the Facility perimeter to achieve final reclamation objectives in all mine plan phases. It is anticipated that this will take place over one 2–3-week period of time during each phase. For the quarry, development conditions will be when developmental work, including operation of a blast hole drill rig, loading/hauling shot rock, and a bulldozer, will be occurring above the highwall as the quarry expands to the south and north during all phase of the mine plan. It is anticipated that development sound levels will be for a duration of 2 weeks per phase during Phases 1,2,3 and, beginning in 2066 (Phase 4), for 2 weeks every three years.

Barton followed the prescribed methodology and accounted for comments/requests from the regulatory agencies when performing the sound assessment and assessed potential noise impacts for the entire LOM through all four phases of the project. As previously stated, the sound study was developed to assess ambient and future sound levels for operations associated with the quarry/RM Facility development, as well as to assess potential sound impacts from proposed additional trucking of RM material along Thirteenth Lake Road.

Utilizing the information collected during the field investigation, future sound levels under the different

phases and operational conditions were modeled. The methodology in this report utilized the industry standard software modeling program dBMap, which is International Standards Organization-compliant (ISO 9613 1,2,3). The dBMap modeling tool is a more comprehensive sound propagation analysis method than the previously utilized straight-line projection method and accounts for surface reflection and absorption, atmospheric absorption, geometric divergence, weather conditions, topography, source sound power level, and additive effects of all on-site sound sources. The less sophisticated straight-line projection method used previously is more conservative and subsequently yields higher projected sound levels than those projected from the dBMap software. The dBmap software, however, more accurately reflects sound attenuation resulting from the site conditions mentioned above and allows for a more comprehensive analysis of sound impacts from multiple sources. In the end, even though the predicted noise levels from dBmap modeling are less conservative than the straight-line methodology, they still result in conservative estimates that are frequently higher than what is measured in the field during post-permitting monitoring. Moreover, Barton's modeling using the dBmap software incorporates numerous conservative assumptions/input parameters (distance attenuation, atmospheric absorption, ground attenuation, barrier attenuation) that further result in predicted noise levels being higher than what would be measured in reality.

7.5.2 Results

During each of the sound level data collection events, in-person sound observations demonstrated that the predominant sources of sound were related to insects, birds, moving water and public road traffic and not related to mining activities. The lowest recorded sound levels at any monitoring location qualified as "Very Quiet to Quiet" which is analogous to a range of sound from "library like quiet/soft whisper" to "living room/bedroom/light auto traffic" (NYSDEC Noise Policy, DEP-00-1, Table E).

A summary of projected sound levels is included in Table 2, Projected Sound Level Increases During Each Mine Plan Phase.

7.5.2.1 Baseline/Ambient Data

The lowest (i.e., quietest) sound level recorded during any sound monitoring event was used to conservatively determine the worst-case potential increase at each monitoring location during each phase of the Permit Modification Mine Plan during normal and developmental activities.

Barton Property Boundary Monitoring Locations –

- M-3 - 34.9 dB(A)
- M-4 - 41.1 dB(A)
- M-5 - 36.6 dB(A)
- M-6 - 43.2 dB(A)

Public Monitoring Locations –

- M-7 - 44.5 dB(A)
- M-8 - 48.6 dB(A)
- M-9 - 39.3 dB(A)

Wilderness Monitoring Locations –

- M-6a - 44.1 dB(A)

7.5.2.2 Normal Operating Conditions (All Four Phases)

Barton Property Monitoring Locations - The largest projected increase in sound level during normal operating conditions during any phase of the Permit Modification Mine Plan was modeled to be 5.5 dB(A) (from 34.9 to 40.4 dB(A)) during Phase 1 at the Site property line at Monitoring Location M-3.

Public Monitoring Locations - The largest public receptor increase in sound level during normal operating conditions during any phase of the Permit Modification Mine Plan was modeled to be 2.9 dB(A) (from 39.3 to 42.2 dB(A)) at the Ruby Mountain View Road Monitoring Location M-9; the remaining public monitoring locations were projected to have less than a 1.0 dB(A) increase.

7.5.2.3 Development Operating Conditions (two weeks per each mining phase)

Barton Property Monitoring Locations - The largest projected increase in sound level during any development phase of the Permit Modification Mine Plan was modeled to be 8.1 dB(A) (from 36.6 to 44.7 dB(A)) at the Site property line at Monitoring Location M-5.

Public Monitoring Locations - The largest projected public receptor increase in sound level during any development phase of the Permit Modification Mine Plan was modeled to be 4.6 dB(A) (from 39.3 to 43.9 dB(A)) along Ruby Mountain View Road Monitoring Location M-9.

Table 4. Calculated increase in sound levels over *ambient* conditions during permitted hours

Monitoring Location	Lowest recorded Sound Level Leq (7:00 a.m. - 3:00 p.m.)	Increase In Total Modeled Sound Levels Over Ambient dB(A) Leq Permitted Hours															
		Phase 1 (Present - 2036)				Phase 2 (2037-2048)				Phase 3 (2049-2066)				Phase 4 (2067-2090)			
		Normal Operations		Development Activites		Normal Operations		Development Activites		Normal Operations		Development Activites		Normal Operations		Development Activites	
		Total Modeled Sound Level	Change Over *Ambient*	Total Modeled Sound Level	Change Over *Ambient*	Total Modeled Sound Level	Change Over *Ambient*	Total Modeled Sound Level	Change Over *Ambient*	Total Modeled Sound Level	Change Over *Ambient*	Total Modeled Sound Level	Change Over *Ambient*	Total Modeled Sound Level	Change Over *Ambient*	Total Modeled Sound Level	Change Over *Ambient*
M-3 Barton Property	34.9	40.4	5.5	41.2	6.3	36.7	1.8	36.7	1.8	36.1	1.2	36.1	1.2	35.6	0.7	35.9	1.0
M-4 Barton Property	41.1	43.2	2.1	45.2	4.1	44.1	3.0	43.6	2.5	43.2	2.1	43.6	2.5	44.1	3.0	47.2	6.1
M-5 Barton Property	36.6	37.9	1.3	44.7	8.1	37.3	0.7	37.3	0.7	37.7	1.1	37.7	1.1	37.9	1.3	43.1	6.5
M-6 Barton Property	43.2	48.5	5.3	48.5	5.3	48.5	5.3	48.5	5.3	47.2	4.0	47.2	4.0	47.2	4.0	47.2	4.0
M-6a Wilderness	44.1	46.6	2.5	48.8	4.7	45.5	1.4	48.2	4.1	45.3	1.2	46.6	2.5	45.3	1.2	45.3	1.2
M-7 Public Road	44.5	45.4	0.9	45.8	1.3	45.4	0.9	45.4	0.9	45.4	0.9	45.4	0.9	45.4	0.9	45.8	1.3
M-8 Public Road	48.6	48.8	0.2	49.0	0.4	48.8	0.2	48.8	0.2	48.8	0.2	48.8	0.2	48.8	0.2	49.0	0.4
M-9 Public Road	39.3	42.2	2.9	43.2	3.9	42.2	2.9	42.2	2.9	42.2	2.9	42.2	2.9	42.2	2.9	43.9	4.6

Green Shading Represents Human Response to Sound of "Very Quiet to Quiet" per Table E of the NYSDEC's Noise Policy, DEP-00-1, Assessing and Mitigating Noise Impacts.

7.5.2.4 One-Hour Increase in Quarry Operating Hours (All Four Phases)

The Permit Modification Sound Study analyzed projected sound levels from the proposed increase in quarry operating hours from 7 am to 4:30 PM to allow for improved operating efficiency to minimize time drill rigs are on-site. Normal operations and development activities were modeled for worst-case sound level increases. The data can be found in Table 5, Modification to Quarry Operating Hours – Total Calculated Sound Pressure Levels dB(A).

7.5.2.4.1 Normal Operating Conditions

Barton Property Monitoring Locations – The largest projected increase in sound level during normal operating conditions during any phase of the Permit Modification Mine Plan was modeled to be 1.5 dB(A) (from 35.7 to 37.2 dB(A)) at the Site property line at Monitoring Location M-5.

Public Monitoring Locations - The largest increase in sound levels during normal operating conditions during any phase of the Permit Modification Mine Plan was modeled to be 4.0 dB(A) (37.2 to 41.2 dB(A)) along Ruby Mountain View Road Monitoring Location M-9.

7.5.2.4.2 Development Operating Conditions

Barton Property Monitoring Locations - Site property line monitoring location M-5 showed the largest projected sound level increase during the short duration development activities. It is projected that M-5 sound levels will increase intermittently during these development activities from a baseline of 35.7 dB(A) to 44.6 dB(A).

Public Monitoring Locations - For the three public receptor monitoring locations, Ruby Mountain View Road monitoring location M-9 showed the largest projected sound level increase during the short duration development activities. It is projected that M-9 sound levels will increase intermittently during these development activities from a baseline of 37.2 dB(A) to 43.2 dB(A)

Table 5: Modification to Operating Hours – Total Calculated Sound Pressure Levels dB(A)

Monitoring Location	Lowest recorded Sound Level L_{eq} (3:30 p.m. - 7:00 a.m. or 3:30 p.m. - 4:30 p.m.)	Normal Operations		Development Operations	
		Total Modeled Sound Level	Change Over *Ambient*	Total Modeled Sound Level	Change Over *Ambient*
M-3 Barton Property	44.3	45.4	1.1	45.4	1.1
M-4 Barton Property	47.4	48.3	0.9	49.9	2.4
M-5 Barton Property	35.7	37.2	1.5	44.6	8.9
M-6a Wilderness	42.4	45.7	3.3	48.3	5.9
M-7 Public Road	41	42.8	1.8	43.5	2.5
M-8 Public Road	45.1	45.6	0.5	45.9	0.8
M-9 Private Road	37.2	41.2	4	43.2	6

Green Shading Represents Human Response to Sound of "Very Quiet to Quiet" per Table E of the NYSDEC's Noise Policy, DEP-00-1, Assessing and Mitigating Noise Impacts

7.5.2.5 Increased Haul Truck Trips

The Permit Modification Sound Study evaluated the potential sound level increase from an increased number of haul trucks upon public receptors along Thirteenth Lake Road.

The largest projected increase in sound levels as a result of increased haul trips is projected to be 4.5 db(A) (from 58.4 to 62.9 dB(A)) at the intersection of Parrish Road and Thirteenth Lake Road Monitoring Location M-11. See

Table 6.

Table 6: Increased Haul Truck Trips

Monitoring Location	Monitoring Interval March 1, 2021	Recorded dBA L_{eq}	Modeled dBA L_{eq}	Change dBA L_{eq}
M-10	8:52 to 9:52	62.1	64.3	2.2
	11:01 to 11:59	60.9	62.3	1.4
M-11	1:35 to 2:17	58.4	62.9	4.5
	2:22 to 3:22	61.1	63.3	2.2

Green Shading Represents Human Reaction to Increase in Sound of "Unnoticed to tolerable" Per Table B of the NYSDEC's Noise Policy, DEP-00-1, Assessing and Mitigating Noise Impacts.

7.5.3 Discussion of Sound Study Results

7.5.3.1 Barton Property and Public Receptor Monitoring and Projections

Summary of Results - Normal Operating Conditions and Normal One-Hour Quarry Operations Increase:

- All sound level results derived from the three sound studies for all scenarios considered (1) qualify as **"Very Quiet to Quiet"** per Table E of the NYSDEC's Noise Policy, DEP-00-1, Assessing and Mitigating Noise Impacts; and (2) are well below the 55 db(A) standard that the US Environmental Protection Agency (EPA) considers protective of the public health and welfare. *See* NYSDEC Noise Policy, DEP-00-1, at p. 14.
- More specifically, projected sound levels during normal operations and the one-hour increase in quarry hours of operations will not increase by more than 5.5 dB(A) over the lowest recorded baseline sound levels during any phase of the Permit Modification Mine Plan. In the two instances where the sound level increase is conservatively modeled to exceed 5 db(A) (5.5 db(A) at M3 and 5.3 dB(A) at M6 during normal operations), those values will occur on Barton property, not at a public receptor. *See* Table 2 and Figure 2a. The NYSDEC's Noise Policy, DEP-00-1 (at p. 13), instructs that a sound level increase approaching 6 dB(A) may have the potential for adverse effects "only in cases where the most sensitive receptors are present." Such is not the case here, given that these values are projected to occur at the Site property line or within the Site boundary. In any event, the total sound level is "**Very Quiet to Quiet"** at these locations. That is, adding the projected increase to the lowest measured ambient sounds levels at these locations results in a total projected sound level of, respectively, 40.4 db(A) and 48.5 db(A). Per the NYSDEC's Noise

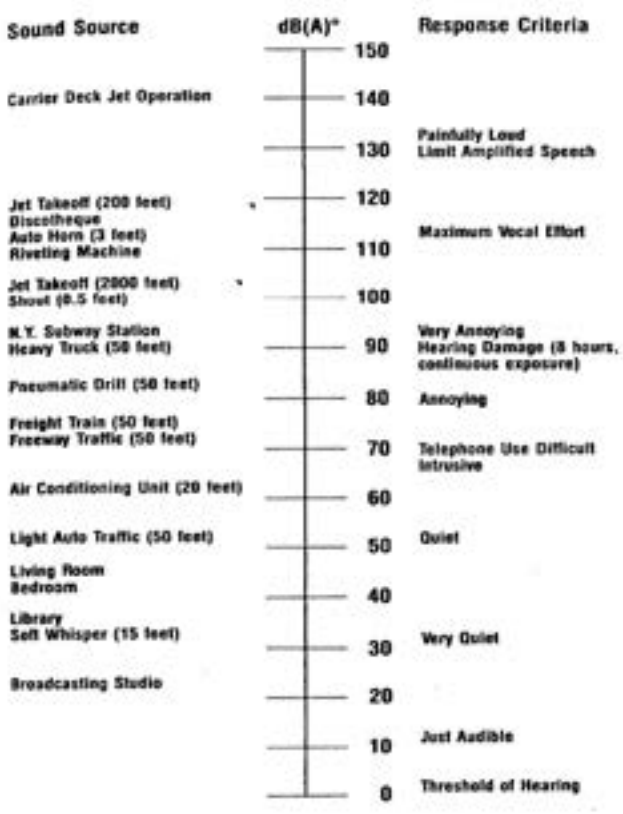
Policy, DEP-00-1 (Table E), these values are classified as "**Very Quiet to Quiet"** and below the EPA's 55 db(A) standard. All public receptor locations conservatively reflect projected sound level increases of a maximum of 2.9 (Table 2) or 4.0 (one-hour quarry increase, Table 23) (both at M9), which increases are unnoticeable to tolerable, per Table B of the NYSDEC's Noise Policy, DEP-00-1. Moreover, the highest total projected sound level at a public receptor during normal operating conditions or with the one-hour increase of quarry operating hours is 48.8 dB(A) (at M-8) (Table 2). Again, this value is classified as "**Very Quiet to Quiet"** per Table E of the NYSDEC's Noise Policy, DEP-00-1, and is well below the EPA's 55 dB(A) "protective of public health and welfare" standard.

- In sum, during normal operations and with the one-hour quarry operations increase, all projected sound levels will remain in the **"Very Quiet to Quiet"** range at all monitoring locations. As for public receptors, any increase in sound above the conservative ambient/baselines measurements will be "**unnoticed to tolerable**" (NYSDEC's Noise Policy, DEP-00-1, Assessing and Mitigating Noise Impacts, Table B).

Summary of Results - Development Conditions and Development One-Hour Quarry Operations Increase:

- Development activities will occur for about two weeks during each project phase (Phase 1 two-week period over 13 years, Phase 2 two-week period over 11 years, Phase 3 two-week period over 17 years, Phase 4 two-week period every three years). During these development periods, sound levels are anticipated to periodically reach worst-case sound levels intermittently during daytime operating hours. The periodic sound level increases will not be continuous throughout the day.
- During development activities, all projected sound levels will remain below 50 db(A), thus falling in the **"Very Quiet to Quiet"** range (NYSDEC's Noise Policy, DEP-00-1, Table E) and below the EPA's 55 db(A) "protective of public health and welfare" standard referenced by the NYSDEC in its Noise Policy, DEP-00-1. See Tables 2 and 23.
- As for public receptors, all sound level increases during development conditions for all four phases of mining (Table 2) are projected to be less than 5.0 dB(A), ranging from 0.2 dB(A) to 4.6 dB(A). The conservatively projected increases are classified as "**unnoticed to tolerable**" per Table B of the NYSDEC's Noise Policy, DEP-00-1. The highest projected sound level increase associated with the one-hour quarry operation increase during development conditions is 6.0 dB(A) at M9 (Table 23). When added to the ambient sound level measured, this yields a total projected sound level of 43.2 dB(A), which is "**Very Quiet to Quiet"** under the NYSDEC's Noise Policy, DEP-00-1, and well below the EPA's 55 dB(A) "protective of human health and welfare" standard.

NYSDEC's Noise Policy, DEP-00-1, Assessing and Mitigating Noise Impacts Table E



7.5.3.2 Primary Sources of Sound During Monitoring

During all sound studies, audio recordings verified that natural environmental factors and public traffic were the primary sources of sound and had the greatest influence on sound levels. At no time during the sound collection events at any of the public monitoring locations were mine activities determined to be the primary source of sound generation. At times, mine activities could be faintly and intermittently heard in the distance by the human ear. However, the faintness of sound heard by the human ear is not measurable by sound measuring devices and becomes easily indistinguishable from surrounding background of sound sources at any of the public receptor locations when the primary sources of sound are active (See Table 7).

Table 7 (Modified) Comparison of Primary Sources of Sound

Monitoring Location	July 2022 (3:30 p.m. to 7:00 a.m.)	August 2023 (3:30 p.m. to 7:00 a.m.)
	Primary Source of Sound	**Primary Source of Sound**
M-3 Barton	Birds and Beach Rd. traffic	Thirteenth Lake Brook tributary, Beach Rd. traffic and turkeys

M-4 Barton	Thirteenth Lake Rd. traffic, 13th Brook, Insects, and birds	Thirteenth Lake Rd. traffic, and 13th Brook
M-5 Barton	Thirteenth Lake Rd. traffic and insects	Thirteenth Lake Rd. traffic and insects
M-6 Barton	Birds and insects	Not Assessed per request by revised Scope of Work
M-6a Wilderness	Not Assessed per request by revised Scope of Work	Brown Pond Brook, and birds
M-7 Public	Thirteenth Lake Rd. traffic and insects	Thirteenth Lake Rd. traffic, and insects
M-8 Public	Harvey Rd. traffic, and insects	Thirteenth Lake Rd. traffic, Harvey Rd. traffic and insects
M-9 Public	Ruby Mountain View Drive traffic and insects	Ruby Mountain View Drive traffic and Thirteenth Lake Rd. traffic

7.5.3.3 Monitoring and Modeling of Increased Haul Truck Trips

Barton maintains its haul truck in top working condition. The increase in projected sound levels derived from increasing round trips from an average of 5 to an average of 16 haul trips per day, assuming increased sales of RM, will not have a significant impact on sound levels along Thirteenth Lake Road. The maximum increase in sound level is 4.5 dB(A) (see Table 24), which is "**unnoticed to tolerable**" per Table B of the NYSDEC's Noise Policy, DEP-00-1. Despite that this increase is "**unnoticed to tolerable**," to provide further mitigation, Barton proposes to reduce the allowable concentrate and RM hauling by five hours – i.e., from 7 am to 10 pm under the current permit to 7 am to 5 pm in the Permit Modification Application.

7.5.3.4 Primary Sources of Road Sound

Thirteenth Lake Road is a public road that serves the local community and area businesses. The North River Volunteer Fire Department is also located along Thirteenth Lake Road. During the Sound Study, sound levels from passenger cars, light trucks and commercial trucks were also recorded to differentiate the sources of sound. The primary sources of sound were predominately associated with regular traffic along Thirteenth Lake Road.

7.5.4 Recommendations

The Permit Modification Sound Study establishes that sound level public receptor impacts will be "**Unnoticed to tolerable**," the lowest possible categorization of human reaction to sound, in all four phases

of the Permit Modification Mine Plan during normal operating conditions or by the one-hour increase in quarry operating hours or increase in haul trips. All public receptor projected sound level increases are below 5 dB(A) from baseline data collected at each public receptor monitoring location. Any increase in sound level and corresponding Human Reaction qualifies as "**Unnoticed to tolerable**" per NYSDEC's Noise Policy, DEP-00-1, Assessing and Mitigating Noise Impacts Table B: HUMAN REACTION TO INCREASES IN SOUND PRESSURE LEVEL.

Increase in Sound Pressure (dB)	Human Reaction
Under 5	Unnoticed to tolerable
5 - 10	Intrusive
10 - 15	Very noticeable
15 - 20	Objectionable
Over 20	Very objectionable to intolerable

(Down and Stocks - 1978)

Development activities may produce noticeable increased sound levels for short durations of time (two to three weeks on an intermittent basis) during these activities in each phase of the project. That notwithstanding, projected sound levels calculated by employing conservative assumptions, still fall within the "**Very Quiet to Quiet**" range and are below the EPA's 55 dB(A) standard designed to be protective of the public health and welfare. Moreover, development activities that are anticipated to create increased sound levels can be operationally controlled by separating development equipment to avoid sound concentration and/or be communicated to the public as a courtesy mitigation effort.

Although further noise mitigation is not necessary, Barton will continue to apply industry best management practices to minimize sound generating sources.

Additionally, when warranted, Barton will communicate with residents as an additional mitigation measure in the event any unusual circumstances arise that could potentially generate higher-than-expected noise.

7.5.5 Conclusion

Based upon the Sound Study data collected and analyzed, it is conclusive that the industry sound mitigation best practices adopted by Barton will avoid or reduce sound-related impacts to the maximum extent practicable, confirming that no additional sound mitigation measures will be required by the Permit Modification Mine Plan to extend Site operations through the next 67 years.

Barton is committed to operating its mine in a manner that is harmonious with the surrounding environment and respectful of the local community and will continue to utilize best management technology to ensure sound levels remain within the projected sound levels identified in this Sound Study.

7.6 Traffic

Projected sales of RM from the mine, a key factor in reducing the amount of RM needed to be stored at the mine Site, will result in an increase in the frequency of over-the-road trucking along the existing route from the quarry to the Hudson River Plant located approximately four miles away on NYS Route 28. Barton currently averages five truck trips per day over this route to carry garnet concentrate from the mine to the Hudson River Plant. Barton is requesting an average increase of eleven truck trips per day, for an average of 16 trips per day, to meet the projected market demand for garnet and RM.

A traffic impact assessment conducted by Creighton Manning Engineering, LLP **(Appendix Q)** concluded that there would be no appreciable impact on traffic as a result of the proposed increase in off-site mineral truck trips from an average of five trips per day to an average 16 trips per day.

7.7 RM Facility Stability

RM Facility stability, design and long and short-term monitoring have been evaluated/performed under the direction of Knight-Piesold (KP) engineers of Denver, CO. KP has been involved with the construction and oversight of the Barton RM Facility for the past decade. KP has directed storage facility sub-surface exploration, RM sample recovery and property analysis, storage facility instrumentation installation, long-term monitoring, and factor of safety stability analysis activities.

KP has developed a summary letter detailing the design, monitoring, and factor of safety stability analysis results for the RM Facility for all phases of the LOM. This certification letter has been included in permit documents within **Appendix T**. Bowman Consulting, Engineering, Land Survey, and Landscape Architecture (DBA Omlund Engineering) has reviewed the documentation and analysis prepared by KP and participated in the design process of the proposed RM facility and provided New York State Professional Engineer oversite and certification of the design and analysis **(Appendix T)**. Again, this certification covers all four phases of the project for the entire LOM.

7.8 Threatened and Endangered Species

No threatened or endangered species will be impacted as a result of the proposed modification. Even though no threatened or endangered bats were actually identified as being within the project area, tree clearing associated with the expansion will be conducted during a winter time frame. This will ensure minimal impacts to bat species potentially roosting within the proposed project area.

7.9 Archaeological and Historic Resources

H2H requested comments from the Office of Parks, Recreation and Historic Preservation (OPRHP) on the proposed project to determine the potential for any impact to historic/cultural resources. OPRHP determined that no properties, including archaeological and/or historic resources, listed in or eligible for the New York State and National Registers of Historic Places will be impacted by this project **(Appendix K).**

7.10 Critical Environmental Area (CEA)

Barton is currently permitted to mine, extract ore and conduct support operations, stockpile material and construct roads in about 3.5acres of the CEA. The CEA is defined here as a distance of 1/8th mile from the APA Wilderness Area boundary and extending into the Barton property. Proposed development within the mapped CEA requires regulatory approval along Barton's northern property boundary (Figure 2). The proposed expansion will increase permitted activities within the CEA to 29.6acres, a net increase of 26.1 acres. The proposed mining activity is located within the CEA and the mapped 102-acre ore body defined by geologic exploration at the Site. Of the total 102 acres definedby Barton, about 28 acres lie within the CEA and 74 acres lie outside the CEA. Within the permitted 3.5-acre area and the proposed expansion area, the vegetation present is a mix of hardwood and evergreen trees. The soils found in this area are a mix of bouldery, fine sandy loams and rock outcrops. Topographic elevations within the excavation area range from about 2,100 feet amsl to a low of 1,950 feet amsl. Within the proposed support area, topography ranges from about 2,288 feet amsl to a low of about 1,995 feet amsl. The abutting area within the Adirondack Park consists of deciduous and mixed forests with multiple small (less than five feet across) streams, as well as Brown Pond Brook. There is one freshwater forested/shrub wetland that lies directly west of the proposed and existing pits. This wetland sits at an elevation of 1,936 feet amsl. This area topography is made up of sloping hills and multiple small valleys.

The closest mapped trail to the CEA within the proposed expansion area is Peaked Mountain Trail, which

is located to the south and west of the mine Site. The point along this trail that is closest to the mine Site is located at the trial head on the northern shore of Thirteenth Lake and is approximately 0.8 mile from the closest portion of the affected CEA. Based on viewshed analysis results, there is no point along this trail that will have views of the proposed mine Site within the CEA. Treetops within the proposed affected CEA can be partially viewed from the top of Gore Mountain, greater than five miles from the Site. It may also be possible to see the treetops within the affected CEA from peaks to the north of the mine Site, but there are no mapped trails in this area.

Barton is proposing to further expand the footprint of the quarry and RM Facility within the CEA in Phase 1 of mining. Reclamation of the CEA impacted by the RM Facility and quarry will begin in Phase 2 of mining. As soon as the footprint of the RM Facility is established, reclamation will begin. The portion of the CEA impacted by the excavation area will not be able to be fully reclaimed until the final phase of mining (approximately 2096). However, the upper benches will be reclaimed once mining is complete. During the final phase of mining, fine-grained RM will be deposited in the northernmost portion of the mine (i.e., the area that entersthe CEA). Once the mined-out area is filled with fines and coarse materials, it will be reclaimed with topsoil and vegetation. Reclamation of these areas will involve a minimum of 6 inches of topsoil to be placed over the deposited RM. Planting of appropriate vegetation will then follow. Based on the test plot that was planted on the RM Facility, the trees that grow most successfully in the material are aspen trees.

Based on 2014 USDA forest inventory, there are approximately 640 trees per acre in forested regions of New York State (includes trees one inch in diameter or greater). Based on this assumption, approximately 16,678 treeswill be cut down in the CEA. Using a rough estimate of 10 foot spacing between trees, approximately 680 trees per acre will be replaced as part of reclamation. This results in approximately 17,721 trees over the affected portion of the CEA. Overall, there will be an increase of trees in the CEA over the life of the operation.

8.0 RECLAMATION

NYSDEC reclamation conditions stated in MLR Permit 5-5230-0000/0002 have been followed on the Site where applicable. Topsoil from all affected areas was stripped, stockpiled and vegetated from all areas before overburden stripping operations took place (**Appendix N**). This historic activity ensures that reclamation activity can effectively takeplace in the future. Reclamation within the quarry and RM storage areas will be consistent with NYSDECstandards as previously permitted and as detailed below.

8.1 Quarry

Reclamation within the quarry is proposed to be modified to accommodate the placement of fine-grained RM in containment cells, which would be phased to occur concurrently with excavation. Once settled and stable, the mine floor will be reclaimed in the same manner as the RM Facility. Mine benches will be covered with a minimum of 6 inches of topsoil, fertilized as required, and seeded with a mixture of warm-season grasses and perennial legumes. Drought-tolerant and native species will be utilized wherever possible to supplement the revegetation of the pit benches.

8.2 RM Facility

Reclamation within the RM Facility will be phased to occur concurrently with footprint expansion (**Figure 6.2.A**). The RM Facility will be reclaimed in a manner consistent with the Revegetation Testing Program conducted in the summer of 1998 (**Appendix N**) progressively in Phases 2-4 of the project.

9.0 CLIMATE CHANGE

The Barton project as proposed will have a negligible impact on and will not impede New York State goals on greenhouse gas (GHG) emissions. Barton Mines is not a registered Title 5 source of air emissions. Total emissions from all sources for the life of the proposed project will remain essentially unchanged.

For the duration of the project, the number and type and use of mobile equipment should remain the same. Production capacity will not increase. The number of daily truck trips is projected to increase from an average of five to an average of 16 over time as the market demand for RM, as currently anticipated, develops. Advances in technology may lead to more efficient mobile equipment and the potential addition of electric powered trucks, which may lead to a decrease in overall emissions. Barton will take advantage of these opportunities when feasible and economical.

10.0 CONCLUSIONS

In designing this project, Barton has worked closely with both permitting agencies to ensure performance of a thorough impact analysis as to all resources possibly affected by the proposed permit modification. All potential effects of significance from this project have been comprehensively evaluated, consistent with agency guidance, protocols, and policies, using conservative assumptions/input parameters, thus over-stating any possible environmental or community effects. Barton also has designed this project to avoid impacts and incorporated extensive mitigation to reduce impacts over the entire 67-year LOM. Indeed,

Barton elected to forego other development scenarios because of their comparatively greater environmental impacts (e.g., visual/aesthetic, groundwater, surface water/wetlands, noise, etc.), instead selecting this lower-impact alternative, notwithstanding that this project sacrifices significant ore reserves at depth. This project is, thus, the best-case scenario for avoiding and mitigating environmental impacts to the maximum extent practicable while allowing for continued Site development.

The following are high-level design benefits that have been incorporated into the Mine Plan for avoiding and mitigating community and environmental impacts:

- Minimize visual and aesthetic impacts through a progressive, concurrent reclamation and revegetation plan;
- Reduce water withdrawal from Thirteenth Brook through the installation of a new groundwater well within Barton property boundary;
- Minimize sound impacts through operational, administrative and engineering controls;
- Ensure dust control by incorporating environmentally-friendly encapsulation additives to the existing dust control plan;
- Ensure long-term RM Facility stability through oversight by a NYS licensed professional engineer and provide routine monitoring reports concerning stability parameters;
- Minimize the LOM boundary and RM Facility height by utilizing fine-grained RM for backfilling the quarry;
- Increase community residents' "quiet-time" along Thirteenth Lake Road by reducing trucking hours;
- Improve the mine site entrance along Thirteenth Lake Road by paving the main entrance (competed summer 2024);
- Ensure night sky preservation by not introducing any additional light sources and retrofitting existing mine site required illumination with downward directional lighting that is dark sky compliant; and,
- Ensure no negative climate change impacts during all four phases of the Mine Plan.

Additionally, throughout the planning process, Barton has engaged in extensive community outreach to act as a good neighbor and include the community in the planning effort **(Appendix W).** Barton has been an involved and engaged member of the Johnsburg/Indian Lake community for more than a century. In keeping with the company's enduring commitment to maintaining an open dialogue with other community members on matters of mutual interest, Barton has proactively informed the community of its permit modification request and invited public input since beginning the permit modification process in 2021. This outreach includes three public presentations, including a project information meeting attended by more than 70 community members; more than 20 project briefings to neighbors, community organizations, individual community leaders, and news media organizations; and two community mailings to more than 4,000 local

property owners. See **Appendix W.**

Notwithstanding the significant effort to mitigate all adverse environmental impacts to the maximum extent practicable, Barton has looked for a way to enhance recreational opportunities in the area as further mitigation for this project. Barton family members have significant land holdings on and around Gore Mountain and Little Pete Gay Mountain, which is approximately five miles south of the Ruby mine site. A portion of the Little Pete Gay area has been sought after by recreational groups and neighbors to connect the existing network of Nordic and hiking trails between the North Creek Ski Bowl and the Siamese Ponds Wilderness Area. As part of its commitment to this community, Barton is proposing agreements with the Town of Johnsburg to provide the necessary easements and/or leases to significantly enhance the trail network for the benefit of local residents and the tourism/recreation industry. In addition, following closure of the Ruby mine, Barton will explore available opportunities for dedicating all or a portion of the property to recreation and conservation use via a conservation easement or a grant in fee. If feasible mechanisms and suitable recipients are identified, Barton will consider dedicating some or all of the land to these endeavors.

In short, Barton has developed this project in a transparent manner, conducting a searching, comprehensive environmental review as to all potentially affected resources, with due attention to questions/requests from the permitting agencies and input from the public. The project plan set forth in the permit modification application accomplishes the dual goals of continuing responsible resource development at the Site (which significantly benefits the New York State and Adirondack economy) while minimizing environmental/community impacts. Barton, therefore, looks forward to moving this process forward to conclusion.