Michigan Department of Environmental Quality
Response to Public Comments Received
Eagle East Amendment Request
Public Information Meeting June 8, 2017
Public Comment Period June 8 to July 20, 2017

Part 632 Application Review Process

The Michigan Department of Environmental Quality (MDEQ) made a determination that the review of the Eagle East Amendment Request shall proceed as a significant amendment, which follows the same process as a new permit under Part 632, Nonferrous Metallic Mineral Mining, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Part 632). After the request was determined to be administratively complete, and as directed by the Part 632 review process, a public meeting was held on June 8, 2017, followed by a 28-day written public comment period. Upon a request made during the public comment period, the MDEQ agreed to extend the written comment period by 14 days to July 20, 2017, to allow for additional time to review the original mining permit and associated documents added to the MDEQ website toward the end of June. The Part 632 process requires the MDEQ to make a proposed decision on the amendment request within 28 days of the close of the written public comment period. Following a review of the documents and public comments received, the MDEQ announced a proposed decision to grant the amendment request.

The next step in the process directs the MDEQ to hold a public hearing regarding the proposed decision, followed by another 28-day written comment period. The hearing is scheduled for September 25, 2017, from 6:00-9:00 PM at the at Westwood High School auditorium, 300 Westwood Drive, Ishpeming, Michigan, and the written public comment period will close at 5:00 PM on October 23, 2017. The MDEQ is required to make a final decision within 28 days of the close of the comment period following the hearing, unless the review time is tolled due to a request for additional information. Part 632 also requires the MDEQ to issue a report summarizing all comments received and provide a response to those comments after the expiration of the public comment period following the hearing.

The following document is a summary of comments received during the review thus far, and the MDEQ responses to those comments. While not required under Part 632 at this stage in the application review process, the MDEQ has resolved to issue a response to public comments prior to the public hearing. After the close of the public comment period following the hearing, and once a final decision is made, the MDEQ will prepare a supplement to this document summarizing additional comments received and MDEQ response.

Eagle East Amendment Request
Summary of Public Comments and Response
Public Meeting and Comment Period June 8 to July 20, 2017

1. **Comment:** Eagle East should be a separate mining permit since it is a separate ore body.
   Response: The geologic setting for the Eagle and Eagle East ore bodies are quite similar, and it is common for multiple ore bodies to be mined utilizing one common mining area and access portal. In this case, the Michigan Department of Environmental Quality (MDEQ) determined that the amendment request to mine Eagle East constitutes a significant change from the conditions of the approved mining permit for Eagle. Therefore, the MDEQ has submitted the request to the same review process as provided for a new permit application pursuant to the Part 632 significant amendment process.

2. **Comment:** We request that Lundin be required to install extensometers or convergence monitors in every secondary stope, as well as leave rib pillars in place in secondary stopes to provide physical, standing support to any unanticipated, potential detached block.
   Response: Falls of ground is a safety issue regulated by Mine Safety and Health Administration (MSHA). While subsidence is not predicted to be measurable at the surface as a result of utilizing the approved mining method for mining Eagle and Eagle East, the MDEQ will require that Lundin Mining (Lundin) continue subsidence monitoring at Eagle and expand the surface monitoring to Eagle East.

3. **Comment:** The 2016 Permit Condition E8 amendment should be revoked or at the very least reconsidered.
   Response: The referenced Permit Condition E8 was established as a special permit condition in Mining Permit MP 01 2007, and has not been amended since permit issuance. In the original application for Eagle Mine, the mine plan included mining to 383 meters above sea level (MASL). However, the MDEQ added a special condition (E8), as recommended by an independent expert, which outlined a plan to collect additional data to confirm the stability of the crown pillar. Monitoring and data collection continues to be required during the mining of Eagle, and would also be required during the mining of Eagle East.

4. **Comment:** We recommend increasing the financial responsibility instrument by an order of magnitude ($500 million) beyond what is currently required.
   Response: The MDEQ does not have the authority to arbitrarily increase financial assurance. Financial assurance is required to be sufficient to cover the cost to administer, and to hire a third party to implement, reclamation under the mining, reclamation, and environmental protection plan, as well as necessary environmental protection measures, including remediation of any contamination of the air, surface water, or groundwater that is in violation of the mining permit, including reasonable contingencies. Current conditions at Eagle Mine do not warrant the amount recommended. Furthermore, financial assurance calculations are required to be updated at a minimum of every three years, or as determined to be necessary, such as if monitoring indicates there is a change in site conditions or to consider approved permit amendments.

5. **Comment:** We request that consideration of the Eagle East permit application be postponed until the Michigan Attorney General and DEQ, working together with the federal

Mine Safety and Health Administration, respond to our letter, and complete a thorough and publicly-transparent investigation of the geological stability of Eagle Mine. The failure of geological faults within Eagle Mine could prove fatal for workers and catastrophic for the surrounding watersheds. Any large-scale collapse would result in the destruction of wetlands, streams, and rivers in the surrounding watersheds and aquifers, exposing sulfides that will cause devastating and long-lasting pollution to the watersheds, including Lake Superior. Please hold a public meeting to discuss the results of the structural stability investigation before proceeding with the Eagle East permit amendment process.
Response: Best industry practices and Lundin's mining permit (MP 01 2007) dictate ongoing structural stability evaluations throughout the life of the mine. The approved mining method was reviewed by two independent rock mechanics experts and both concluded the method follows best industry standards. Furthermore, the mining method was heavily vetted in a contested case, and was upheld by the Administrative Law Judge, followed by the Circuit court, and Michigan Supreme Court.

6. **Comment:** In July 2016, Lundin began construction of an unpermitted access tunnel to connect the current, permitted, Eagle Mine with the unassessed, unregulated, non-permitted Eagle East orebody. They did not apply for a permit amendment until February 2017. The construction of this tunnel qualifies as a mining activity, as it required the excavation of earth materials to access ore. As Lundin did not have a permit approving this mining activity, they have committed a violation of Rule 201 of Part 632. R425.201(9) states "The department shall not issue a mining permit, or approve a transfer of a mining permit, to a person if the department has determined that person to be in violation of Part 632 of this act".
Response: The activity referenced did not constitute mining under Part 632. At the time MDEQ was notified of this activity, Eagle East was still being evaluated and not yet defined as an ore body. The advancement of a ramp below the original depth of Eagle was intended to allow Lundin to better evaluate a potential access ramp to Eagle East, as well as allow for further evaluation of Eagle East as an ore body.

7. **Comment:** There will be increased cumulative impacts to infrastructure and utilities, due to the extension of the Life of Mine (LOM). The increase in power usage identifies a clear and definitive increase in cumulative impacts on existing infrastructure. Hauling for two years beyond the previously permitted operations and LOM estimates will lead to an increase in cumulative impacts due to extended mining and hauling operations.
Response: The current infrastructure for Eagle Mine can meet the needs for the addition of Eagle East without increasing infrastructure.

8. **Comment:** A full investigation, to be conducted by an independent third party, into the stability of Eagle Mine. This investigation must be concluded and made available to the public before any permit amendment authorizing the expansion of Eagle Mine to include Eagle East is granted. A full investigation, to be conducted jointly by the DEQ and MSHA, into the stability of Eagle Mine and whether Lundin followed proper protocol following the significant fall of ground incident in August 2016. This investigation should consider the implications of the results on both worker, environmental, and public safety. This investigation must be concluded and made available to the public and to the employees of

Lundin working at Eagle Mine before any permit amendment authorizing the expansion of Eagle Mine to include Eagle East is granted.

Response: A proper investigation into the fall of ground was conducted by MSHA. No environmental monitoring data indicated the fall of ground went beyond the immediate area of the fall. Following the incident, MDEQ staff and Lundin representatives reviewed the monitoring data that is designed to provide early warning of subsidence or unidentified fractures that may propagate to the surface or near surface as outlined in the mining permit. None of the monitoring showed, or has shown thus far, any evidence of propagation near the surface. Ongoing collection of in situ stress data, and standard geologic, geotechnical, and hydrologic data is required to continue to evaluate rock stability for the overlying level or levels. The approved mining method was reviewed by two independent rock mechanics experts and both concluded the method follows best industry standards. Furthermore, the mining method was heavily vetted in a contested case, and was upheld by the Administrative Law Judge, followed by the Circuit court, and Michigan Supreme Court.

9. **Comment:** In the event that the permit is granted, a permit condition is applied such that, during the extended LOM beyond the previously permitted operations and LOM estimates, hauling of ore is to be permitted only between the hours of 7am and 7pm, in order to minimize disruption and disturbance, in the form of noise pollution, to residents of Marquette County who live along the haul route.
   Response: The MDEQ does not have the authority under Part 632 to dictate hauling times.

10. **Comment:** Only the highest-grade ores will be taken, partially wasting the resource (which is owned by the State of Michigan). This is a violation of the Public Trust.
    Response: The MDEQ has seen no evidence of high-grading of any of the ore bodies.

11. **Comment:** The permit calls for backfilling of the mine with waste rock and cemented backfill, but fails to consider the source of the sand, gravel and portland cement, or the environmental impacts of multiple new and existing rock and sand quarries transporting this material to Eagle Mine by truck. Currently the number of sand and gravel trucks appears to be as great as the number of ore trucks.
    Response: All aggregate imported to the mine site must be characterized to demonstrate that it has a net neutralization capacity of zero or higher. If aggregate quarries are not within the mining area and are not owned or controlled by the permittee, they do not fall under the authority of Part 632. Quarry operators may be required to obtain other permits, depending on the size of the operation and types of activities conducted.

    Borrow pits are common with mining. Both active and abandoned mines have used substantial amounts of material from borrow pits for many reasons. The MDEQ is not aware of environmental impacts from borrow pits.

12. **Comment:** What are the potential impacts of increased truck traffic for transport of aggregate? Why no limits or environmental impacts for aggregate trucking? Vehicles used for Eagle East mining exploration including drill rigs, contractor trucks, water trucks, drilling

fluid trucks and heavy equipment, are NOT accounted for in the Environmental Impact Assessment.
Response: Offsite transportation does not fall under the authority of Part 632.

13. **Comment:** Lundin Mining Company needs to design and include in this permit application underground bulkheads in the declines to seal off the underground workings from the overlying glacial aquifers or surface water. The construction of decline bulkheads, vent raise plugs, and sealing any connection to the surface needs to be included in the mine closure before flooding of the underground.
Response: Special Permit Condition P2 of Mining Permit MP 01 2007 specifies that the underground workings, portal, and vent shaft shall be reclaimed to prevent adverse impacts from migration of fluids from the underground openings upward into the alluvial aquifer. Special Permit Condition P3 requires cemented backfill plugs be placed at approximately 335 MSL in the mine decline and underground workings to prevent adverse impacts from interconnection of different groundwater regimes, as presented in the Reclamation Plan included in the Eagle Project Mining Permit Application. The final closure plan will be reevaluated as more data is collected for final approval.

14. **Comment:** Financial assurance should include unpredictable or unrecognized problems of the future.
Response: Financial assurance is required to be sufficient to cover the cost to administer, and to hire a third party to implement, reclamations under the mining, reclamation, and environmental protection plan as well as necessary environmental protection measures, including remediation of any contamination of the air, surface water, or groundwater that is in violation of the mining permit, including reasonable contingencies. The financial assurance for Eagle Mine meets the requirements specified in Part 632. Calculating the cost to remediate something that is unpredictable or unrecognized is not required by Part 632, nor is it practicable. However, extensive monitoring of the conditions in and around the mining area is required throughout the life of the mine and post closure monitoring period. Financial assurance calculations are required to be updated at a minimum of every 3 years, or as determined to be necessary, such as if monitoring indicates there is a change in site condition or to consider approved permit amendments.

15. **Comment:** Emergency egress not adequate.
Response: Mine safety falls under the authority and strict oversite of MSHA.

16. **Comment:** Cement that has been tested to a UCS magnitude lower than the overburden pressure suggests that the mining backfill methods could fail, and create subsidence.
Response: Tight back fill will reduce the potential for subsidence, but, some minor subsurface subsidence is expected. However, no measurable expression of subsidence is predicted to occur on the surface.

17. **Comment:** Why are the two new monitoring wells so close together and both south of Eagle East while not adding any monitoring wells to the east or north of the mining area particularly since Eagle Mine has always contended that groundwater flow direction is northeast?

Response: The new wells were co-located with bedrock exploration/ characterization holes to test for hydraulic connection between the deep Eagle East ore body in bedrock and the shallow unconsolidated glacial deposits. No connection was observed in testing, however, geologic, rock mechanics, and hydrogeologic data collection as prescribed in the Eagle Mine permit will occur during the development of Eagle East.

Mining activities at Eagle East will be conducted approximately 3,000 feet below the surface and in much lower permeability rock than experienced at Eagle Mine. It is not anticipated that vertical hydraulic movement from such a great depth will occur. However, well nest QAL009A/9D is positioned directly above the Eagle East deposit so any influence would be observed there. As required by the mining permit for Eagle Mine, Lundin will collect geologic, rock mechanics, and hydrogeologic data throughout the mining of Eagle East.

18. **Comment:** Where is the backfill going to be obtained for Eagle East?
Response: The MDEQ has not been informed of the location the aggregate will be obtained. However, Special Permit Condition E6 of Mining Permit MP 01 2007 dictates that all aggregate imported to the mine site to be utilized for backfill must be characterized to demonstrate that it has a net neutralization capacity of zero or higher.

19. **Comment:** How can Golder state that rock mass strengths are similar at the two locations based on UCS when UCS is only one of at least five parameters in the RMR76 rock mass classification system used to determine rock mass strength?
Response: Drill core from Eagle East was geotechnically logged and compared to the rock mass characteristics (UCS, RMR76, Young's Modulus, Poisson's Ratio, structural fabric, and geology) of Eagle. Given that the rock mass characteristics are similar between the two locations, the rock mass strength is therefore estimated to be comparable.

20. **Comment:** Rescue chambers should be labeled in Figures 4-1 and 4-2.
Response: The location of refuge chambers falls under the authority of MSHA.

21. **Comment:** Please explain the rationale for removing the factor of safety for calculating pumping capacities for underground.
Response: Since the beginning of underground operations at Eagle Mine, mine dewatering has been measured and compared to the original groundwater flow model predicted inflow rates. The actual measured rates are considerably less than the very conservative modeled rates, as expected.

22. **Comment:** Subsidence monitoring equipment should be installed above Eagle East before production begins.
Response: Lundin will be required to conduct surface subsidence monitoring above Eagle East. Furthermore, Lundin will collect geologic, rock mechanics, and hydrogeology data throughout life of mine.

23. **Comment:** Will additional power be needed to mine Eagle East, and if so, where will it come from? DEQ should require Eagle Mine to submit a plan for potential power loss that

demonstrates how water quality and quantity will be maintained/protected during short-term and long-term outages.
Response: Lundin has indicated existing power is adequate to handle the addition of Eagle East, and contingencies are in place that will enable Lundin to maintain proper environmental management during power disruption.

24. **Comment:** Life of Mine changes, would this have to be an amendment?
Response: All changes in the mine project are considered by the MDEQ on a case by case basis to determine if an amendment is required.

25. **Comment:** Lost circulation sites occur at the watershed divide. What type of drilling fluid was "lost?" What was used to control the "lost circulation?" Environmental fate of lost drilling fluids?
Response: Drilling mud is composed of a biodegradable polymer typically utilized for drilling operations, and the source of fresh water for the drilling fluid has been approved by MDEQ. Loss of drilling fluid is rare at Eagle and Eagle East due to the lack of fractures in the rock mass. Surface casing is required to be set into bedrock to keep the hole from caving in and effectively seals off the alluvial aquifer. Since the mud is biodegradable, and the lost-circulation zones are relatively rare, such losses have not had, nor would they expect to have, measurable impact.

26. **Comment:** Which year of the Life of Mine will Lundin apply for this (UIC – flooding of underground workings) permit?
Response: UIC permitting is managed by the US EPA.

27. **Comment:** According to the Community Environmental Monitoring Program (CEMP), new "Groundwater Monitoring Wells to be Installed Near Eagle Mine" will be installed during 2017. Based on a review of the available information and public comments, the SWP believes there is a need to install additional observation wells to better understand the mine's potential impact on groundwater quality downgradient from the mine treated water infiltration system." While we support and have advocated for the installation of these critical monitoring wells, there is still no data correlated to these key areas of the Eagle Mine operation. The wells will be adjacent to both the TWIS discharges and the Eagle East exploration area. Any data collected here will be useful for monitoring changing conditions, or the extent of contamination, but cannot be used for baseline data, given how much extensive drilling is already impacting the surficial groundwater aquifer. When will these new wells be installed? Are groundwater discharges already impacting the springs of the East Branch of the Salmon Trout River? Has sufficient baseline hydrological data for Eagle East, representative of all seasons, been gathered in order to reflect any seasonal shifts in groundwater quality?
Response: CEMP is a third-party reviewer of Lundin's environmental data and is independent of the MDEQ process. However, the MDEQ considers all data to be useful in some fashion if the data is collected and analyzed by qualified professionals.

MDEQ is not aware of any impacts to surface or groundwater from drilling. Groundwater and surface water monitoring at and around Eagle Mine facilities has not detected any impacts from drilling, or from the groundwater discharge.

Hydrogeologic data collected at Eagle East is sufficient for the proposed operation. Since the mining activities occur at such a great depth, in crystalline bedrock, seasonal fluctuations do not impact the bedrock hydrogeology.

28. **Comment:** Explain how the company's let's-wait-and-see approach to groundwater monitoring and shifting water chemistry ("pending" and "trending" exceedances of the base line) can protect groundwater from mining-related contamination?
Response: Part 632 requirements are designed to be protective of groundwater. Site-specific groundwater water quality benchmarks were developed for monitored locations and parameters at Eagle Mine incorporating the regulatory guidance provided by Part 632 and the Eagle Mine Mining Permit MP 01 2007. With this guidance, calculated benchmarks are intentionally conservative to allow for reporting of any changes in groundwater chemistry early in their occurrence. Additionally, the groundwater quality data is statistically assessed during operations to test for trends in water chemistry. Monitoring data summary reports are submitted to the MDEQ quarterly, and all monitoring data and trend analysis reports are included in the Annual Mining and Reclamation Reports for Eagle Mine.

Because the benchmarks are conservative, it is expected that there will routinely be instances where a reported value will exceed a calculated benchmark. These exceedances are required to be reported to MDEQ, but do not necessarily equate to exceedances in drinking water standards, or to a permit violation. The data is continually evaluated to determine if the reported values represent a potential trend. If statistical analysis suggests a trend may be present, an evaluation of whether the change from baseline conditions is attributable to mining activities or non-mine related factors. An "action level," as defined by Part 632, is reached at such time sampling at leachate or compliance monitoring wells detects concentrations of a solute that equal or exceed ½ the level between the long-term average background and the drinking water standard for two consecutive sampling events. If an action level is reached, increased monitoring and a source investigation is implemented as approved by the MDEQ. If the change in water quality is determined by the MDEQ to be caused by a release associated with a mining activity, a plan is implemented for a response activity as approved by MDEQ.

29. **Comment:** Will limestone amendment be accomplished underground in the secondary stopes?
Response: The intent of adding limestone to the Temporary Development Rock Storage Area (TDRSA) is to provide for additional neutralizing capacity and to reduce the concentration of pH sensitive metals in the contact water that is collected in the TDRSA contact water collection system. The top and bottom of each secondary stope is capped with cement, providing a degree of encapsulation with neutralizing properties. The contact water from the TDRSA, as well as water pumped out of the underground workings, is monitored for water quality to confirm that control measures are effective. Furthermore, ongoing characterization of the geochemistry of the waste rock and peripheral rock that is

exposed in the process of mining is required throughout the mining operation to calibrate and adjust the model and predictions of potential generation of acid, dissolved metals, and other related substances.

30. **Comment:** According to the Eagle East EIA, constant hydrological monitoring has taken place since 2003. Explain whether monitoring of streams, springs, groundwater wells in the Eagle Mine or Eagle East zone, the brine aquifer, sedimentary host rock in the Eagle East area, or the air permit includes Uranium? Have Uranium limits been established for airborne emissions or water in the Eagle East zone? If not, how is worker safety and environmental safety guaranteed?
Response: Trace levels of uranium are present in many of the geologic formations in the Upper Peninsula, and some in water bearing formations above drinking water standards. However, the geologic formations hosting Eagle and Eagle East, are much lower than regional averages.

    Lundin has been testing for, as part of their ongoing geochemical analyses, for uranium in geologic samples collected during as mining progresses. All mine water is treated through a water treatment plant that is capable of removing Uranium, if present. However, uranium monitoring in the influent and effluent has not detected uranium.

    MSHA is the agency with regulatory oversite for miner safety, and has standards requiring mines to perform radon sampling as radon is a surrogate for uranium monitoring. This testing is conducted by an independent consultant and audited by MSHA. To date, no levels have been detected that meet any threshold for increased monitoring to be required.

31. **Comment:** We request that new emissions from the Eagle East ore body be subjected to a new PTI permitting process, or that the potential to emit be independently analyzed.
Response: The comment refers to the Air Quality Permit for Eagle Mine. No amendments to the Air Quality Permit are anticipated to be required as a result of approval of this amendment request.

32. **Comment:** We request that at least one additional stack test, timed to coincide with full production of Eagle East while Eagle Mine is still in production, be required as a special permit condition under Part 632. Stack test plan must be approved and overseen by AQD staff, to verify whether the Clean Air Act permit limits can be met during the combined operation of Eagle Mine and the new Eagle East orebody. Finally, members of the DEQ's UPESG group (environmental stakeholders from regional organizations) request an opportunity to review and provide comment on the draft Stack test plan.
Response: Without proper justification (i.e. evidence of potential impact from air discharge) the MDEQ is unable to arbitrarily require a permittee to conduct an additional stack test. However, MSHA requires underground air monitoring for miner safety.

33. **Comment:** The Eagle East amendment should be revised to include a specific monitoring and mitigation plan for light pollution. Using Michigan's NREPA guidance on light pollution, "lighting shall be directed downward. Whenever possible, lighting shall be provided by fully shielded fixtures. Wherever practical and appropriate, outdoor lighting fixtures shall

be motion sensor fixtures, and not fixtures that remain lighted during all hours of darkness." Current measures are failing.
Response: During construction, Eagle Mine installed "downcast" lights to minimize light pollution. Eagle Mine utilizes lighting to ensure compliance with MSHA safety standards. The Eagle East amendment does not include additional lighting.

34. **Comment:** Why are these concerns with groundwater quality at the Eagle Mine site, flagged by CEMP, trending and unresolved? What is the cause or source of the shifting groundwater chemistry at Eagle Mine? All potential groundwater contamination concerns need to be clearly understood and publicly addressed before the Eagle East changes are considered. These serious concerns cannot be outsourced to CEMP. The company must be responsible.
Response: As mentioned above, CEMP is a third-party reviewer, the MDEQ reviews all environmental data to assure compliance.

35. **Comment:** We ask that the DNR and DEQ, in their role as environmental stewards, conduct a long-term collaborative study of the Yellow Dog Plains environment to evaluate all aspects of the "cumulative environmental impacts." The Yellow Dog Plains, due to their remote and previously undeveloped nature, will offer an ideal research station for such a study – power, increased traffic, sandpit, exploration drilling, lighting, noise, vibrations.
Response: It is unclear what the commenter is requesting. Exploration and logging activities have been conducted on and around the Yellow Dog Plains for decades.

36. **Comment:** We request an updated and comprehensive evaluation of seismic vibrations from Eagle blasting, including collection of BOTH acoustic and seismic data from Eagle Mine, and acoustic and seismic data from the Eagle East surface exploration area; including a comprehensive biological assessment of fish, frog and turtle egg viability, to be conducted in the Salmon Trout headwaters and wetlands located above the Eagle orebody, in the Yellow Dog River wetland complex located immediately south of Eagle's mine portal, and in springs of the East Branch of the Salmon Trout River (northeast of the TWIS).
Response: Lundin has collected acoustic and seismic data from Eagle Mine and the data concluded no vibration exceeded 2.0 in/sec (Alaska Fish and Game standards for protection of fish) or noise the occur above background ambient noise levels. Since Eagle East is considerably deeper, noise and vibration is not expected to exceed the measured levels at Eagle Mine. Furthermore, fish studies have been conducted annually since the approval of the mine permit application. No impact on fish has been recorded. Results are located in Lundin's annual reports to the MDEQ.

37. **Comment:** According to the EIA, "Eagle currently conducts vibration studies in regard to any potential effects that blasting activities may have on wildlife. Though Michigan does not have standards for vibration of this nature, there is appropriate assessment information used by the U.S. Bureau of Mines and the Alaskan Department of Fish and Game .... Due to the additional depth and distance (of Eagle East) from the Salmon Trout River bed, mining activities from Eagle East are not anticipated to have a vibrational effect that is transmissible to surface which could result in an unacceptable effect on receptors." We recommend that additional vibration receptors be installed in locations protective of wetlands and streams

surrounding Eagle East on the north (ravine with tributary of East Branch of Salmon Trout River) and south (Yellow Dog River wetland complex).
Response: See above response to previous comment.

38. **Comment:** We request that a comprehensive Kirtland's Warbler survey of Eagle East area be completed in the Eagle East zone and the steadily-expanding Area of Impacts. This is especially critical given the confirmed presence of the Kirtland's Warbler (a singing male), an endangered species known to be using jack pine habitat on the Yellow Dog Plains. We ask that the survey be done in collaboration and/or building upon monitoring work currently done by concerned citizens with the Yellow Dog Watershed Preserve. Since extensive exploration drilling in the Eagle East area, operating 24-7 throughout the year, is causing significant light and noise pollution, and disrupting landscape use and habitat in ways that may be already negatively impacting this critical species, we ask the State of Michigan to require strict surface monitoring and special stipulations limiting industrial activity in Escanaba State Forest lands impacted by the Eagle East proposal, and covering adjacent Commercial Forest stands currently used for Eagle East exploration.
Response: Lundin is required to conduct flora and fauna evaluations annually in the areas defined in the EIA, which includes Kirtland's Warbler.

39. **Comment:** The SWP is concerned about the ability of the Eagle Mine Water Treatment Plant (WTP) to effectively treat the anticipated brine water associated with the Eagle East ore body. Similarly, the SWP has concerns about the ability of the Humboldt Mill WTP to effectively treat water from the Humboldt Tailings Disposal Facility (HTDF) following the addition of tailings from the Eagle East ore body. The SWP understands that upgrades to both facilities "may be needed in the future" and recommends that any upgrades to existing water management or treatment systems be completed prior to extraction of ore from Eagle East.
Response: Regardless of the source of the water, the mine permit requires all contact water be treated before discharge, and the discharge must meet the limits set in the Groundwater Discharge Permit.

40. **Comment:** The SWP recommends that uranium as well as any other potential constituents associated with the Eagle East ore body be added to the revised permit as monitoring parameters. The SWP Community Environmental Monitoring Program (CEMP) first confirmed uranium on site in March 2013.
Response: As mentioned above, trace levels of uranium are present in many of the geologic formations in the Upper Peninsula, and some in water bearing formations above drinking water standards. However, the geologic formations hosting Eagle and Eagle East are much lower than regional averages. Lundin has tested for uranium as part of their ongoing geochemical analyses, as well as in water treatment influent and effluent, for which both have been non-detect thus far.

    The uranium identified by SWP was determined to originate from the liner fill material brought from off site. No uranium was detected in the contact water basins. In any case, the water treatment plant design can remove uranium.

41. **Comment:** How much LS required to amend waste rock in TDRSA?
Response: Limestone is required to be added at an amount of 20 tons to every 1,000 tons of development rock placed in the TDRSA, or a rate of 2 percent of development rock.

42. **Comment:** Lacking adequate context and accurate representation of watersheds, this amendment application and EIA cannot be seriously considered.
Response: Eagle East is situated in deep crystalline bedrock beneath the Yellow Dog River topographical watershed, but within the groundwater basin of the Salmon Trout River. However, the addition of Eagle East will have no impact to any watersheds since no new surface facilities are projected to be built. All Eagle East surface operations will occur at Eagle Mine surface facilities. The original Eagle Mine EIA described in detail all primary and sub watersheds that are within the mining area, and assessed potential impacts. These assessments include over 8 years of baseline conditions monitoring at both the Salmon Trout and Yellow Dog River Watersheds, and monitoring continues today. Finally, there is no measurable hydraulic connection between the proposed mine workings and the alluvial groundwater aquifers of the Yellow Dog Plains due to the very deep location of the deposit within extremely low permeability rock.

43. **Comment:** If Lundin receives their permit amendment and mines Eagle East, is the life of mine expected to increase by on year, one and a half years, or two, or three years? How do these shifting numbers impact anticipated cumulative impacts, or the EIA? If Eagle East's life is extended to three years, would this change the duration of mining operation (and the impacts to environment) constitute a "significant change"?
Response: The LOM is an estimate based on many factors including ore grades, location of ore, and current market conditions. The information presented in the application materials is an estimated volume. The rate at which it is mined has very little impact on the environment. It is unclear what cumulative impacts could occur because of an increase to the mine life by a year or two. However, any change in the mining operation will be evaluated by the MDEQ to determine if an amendment is required.