AECOM Canada Ltd.
99 Commerce Drive
Winnipeg MB R3P 0Y7
Canada

T: 204.477.5381
F: 204.284.2040
aecom.com

Jennifer Winsor, P.Eng.
Environmental Engineer
Environmental Approval Branch
Manitoba Environment and Climate
14 Fultz Boulevard
Winnipeg, MB R3Y 0L6

January 15, 2024

Project #

60686634

Dear Ms. Winsor:

Subject: Notice of Alteration for the Operation of a Temporary pH Control System at the Anderson Tailings Impoundment Area

1. Introduction

At the request of Hudbay Minerals Inc. (Hudbay), AECOM Canada Ltd. (AECOM) has completed an environmental review of a temporary mitigation measure that is being implemented at the Anderson Tailings Impoundment Area (ATIA or "Facility") to manage elevated levels of un-ionized ammonia in ATIA effluent. The ATIA is owned and operated by Hudbay in accordance with *Environment Act* Licence No. 3263 (EAL No. 3263).

Based on the information provided by Hudbay and obtained by AECOM, we provide herein a project description and our opinion on the potential for environmental impact in relation to temporary and minor modifications of the project components and operations permitted in EAL No. 3263 as follows:

- Operation of a temporary acid dosing building and associated pumping/piping system;
- Temporary electrical upgrades; and
- Acid tote storage and transport.

The development and operation of these three components are referred to as the temporary pH Control System (or "Project").

This letter has been prepared in support of a Notice of Alteration (NOA) submitted for consideration by the Environmental Approvals Branch (EAB) in relation to EAL No. 3263. This NOA letter report contains the information described in Manitoba Environment and Climate "*Information Bulletin – Alterations to Developments with Environment Act Licenses*" (February 2022). A copy of the NOA Form has been included with this letter.

Prior to finalizing the design and operation of these new components, Hudbay requested advice from AECOM with respect to the anticipated design and environmental mitigation requirements to obtain approval from the EAB to proceed with this proposed mitigation measure. AECOM has conducted an environmental review of the Project plan, and we provide our opinion in this letter with respect to the environmental aspects that will need to be considered in the evaluation of design and mitigation options for this Project.

In planning the proposed pH Control System, Hudbay has taken into consideration the existing environmental conditions at the ATIA and surrounding area, which have been subject to regular and ongoing water quality studies. These studies include compliance monitoring as per EAL No. 3263 and the Metal and Diamond Mining Effluent Regulations (MDMER), and a seasonal (winter, spring, and fall) water quality sampling program that has been occurring at the ATIA since 2012. Hudbay's plans have also taken into account environmental protection practices and procedures included in Hudbay's standards of operation, such as compliance with International Organization for Standardization (ISO) certified safety and environmental management systems.

2. Proponent Contact Information

Table 1.1: Proponent Contact Information

Name of Project	ATIA Notice of Alteration – pH Control System Mitigation Measure
Name of Proponent	Hudbay Minerals Inc. (Hudbay)
Address of Proponent	PO Box 1500, 1 Company Road, Flin Flon, Manitoba, R8A 1N9
Principal Contact Person for the NOA	Landice Yestrau Manager of Environmental Control Ph: 204-687-2169 Email: landice.yestrau@hudbayminerals.com

3. Proposed Acid Dosing Building and Temporary Addition of Sulfuric Acid

3.1 Needs and Objectives

In August 2022, Hudbay experienced a release of effluent from the ATIA containing levels of un-ionized ammonia that exceeded the monthly mean limit as determined and specified in the MDMER. The release was communicated to Manitoba Environment and Climate (MEC) as well as Environment and Climate Change Canada (ECCC) by Hudbay on October 1, 2022. A copy of this communication, which contains additional details regarding the release and subsequent incident investigation, are provided with this letter. Internal and laboratory monitoring conducted in 2023 shows that total ammonia and by association, un-ionized ammonia remains elevated near, but not exceeding, the *MDMER* Schedule 4 monthly mean limit.

In response to the elevated un-ionized ammonia levels and considering the need to discharge water from the ATIA to maintain dam safety and stability, Hudbay has installed and plans to operate, as a temporary mitigation measure, a pH Control System which will be situated at the final discharge location of the ATIA. Considering that un-ionized ammonia concentration is calculated as a function of pH, temperature, and total ammonia as nitrogen, controlling the pH under certain conditions through acid addition will ensure ATIA effluent remains in compliance with un-ionized ammonia regulatory limits.

The pH Control System is intended to be used only under specific conditions as described under **section 3.2.4** (pH Adjustment Conditions) and consists of the following components:

- An acid dosing building and associated pumping and piping systems; and
- Temporary and as-required addition of sulfuric acid to effluent for pH control.

Section 3.2 below summarizes technical components relating to the construction and operation of the pH Control System.

3.2 Project Description

3.2.1 General Overview

The historical pH range of discharge from the ATIA is 6.5 to 8.6. Based on current ammonia concentrations and seasonal water temperatures, Hudbay anticipates that a pH adjustment to a target of 7.0 when needed will ensure compliant un-ionized ammonia levels. To achieve this pH target, small amounts of acid at a rate to be determined, but not exceeding 1,000 mL/min, will be added to the effluent at the intake location of the ATIA siphons. The acid will mix with the effluent through the siphons and pH-adjusted effluent will be discharged at the siphon discharge location.

Acid dosing will be accomplished via the installation and operation of a temporary acid dosing building. The acid dosing building is approximately 2.7 m x 2.7 m at its base, approximately 3 m tall, and has a 0.3-m roof overhang. It houses two identical Diaphragm Motor-Driven Metering Pumps equipped with a Human-Machine Interface (HMI) software system that can be set to a specific rate to ensure the correct amount of acid is discharged. The building is situated on the east end of the ATIA near the discharge location of the ATIA (see **Figure 1** and **Figure 2**).

Figure 1 – Location of pH Control System on the ATIA

Figure 2 – Siphon Intake Location and Discharge Location

Hudbay plans to utilize sulfuric acid, contained in standard 1,000-L Intermediate Bulk Container (IBC) totes, which will be gravity fed into the building's pumping system to achieve the acid dosing needed to adjust the pH of effluent (**Figure 3**). This system was selected as it is the most efficient and cost-effective option to use on a temporary basis.

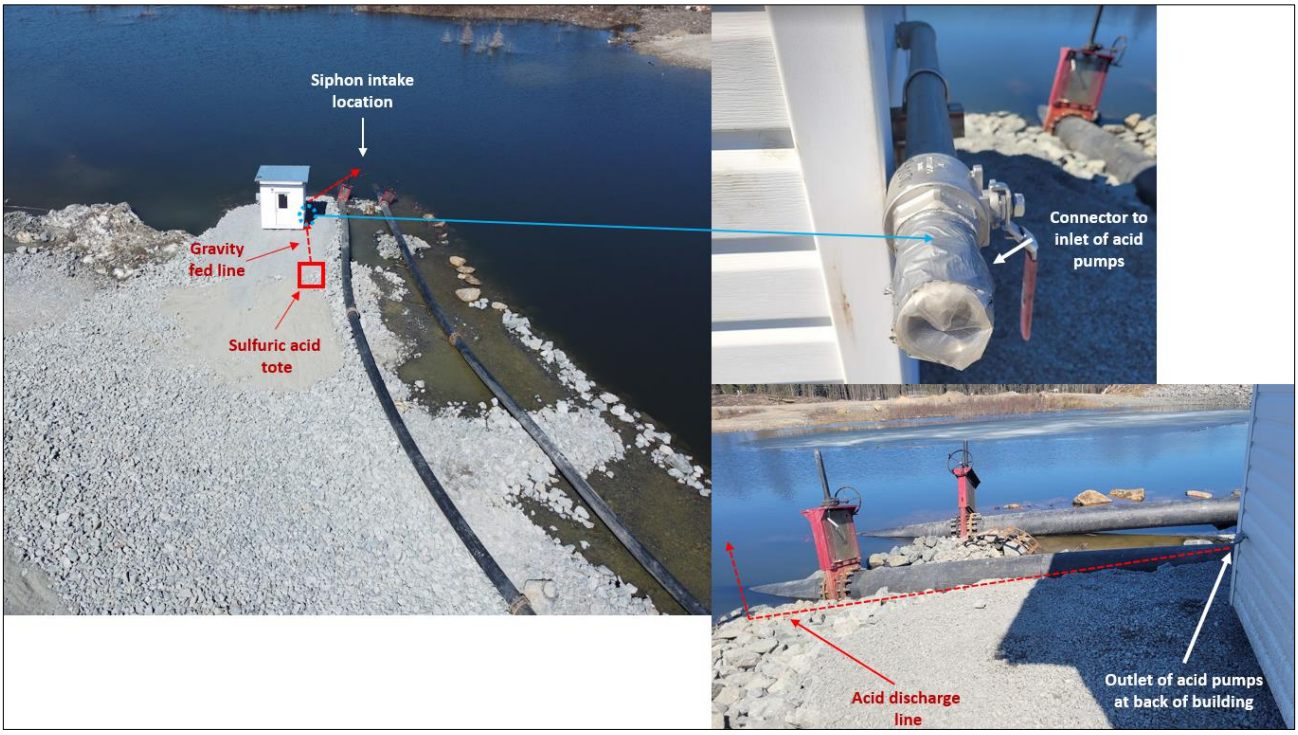

Figure 3 – Location and Components Acid Dosing Building

The area where the building and totes will be located is on a pad approximately 200 m^2 in size. The pad was built up to the desired elevation by pushing a base of approximately 8” minus non-acid generating quarry rock into the ATIA, with a layer of smaller 2” crushed rock placed on top to provide a smooth surface (see **Figure 3**). The area was leveled, and the acid dosing building was constructed on top of the newly constructed pad. The acid totes will be placed in an enclosed secondary containment unit as described in **section 3.2.3** (Sulfuric Acid Storage and Transport) on leveled area adjacent to the acid dosing building.

Figure 3 - Acid Dosing Building Area

3.2.2 Electrical Source

The acid dosing building will be powered by a diesel operated 9 kVa Portable Lighting Plant Generator, equipped with a 213.5 L fuel capacity and low oil pressure / high temperature automatic shutdowns to prevent potential malfunctions. The unit can deliver 8,000 watts and has a runtime of approximately 160 hours.

The unit will be fueled from diesel jerry cans or a pickup truck slip tank and will be kept in a containment tray to capture any spills that may occur during fueling. The spill tray will be monitored during daily fueling when the system is operational for accumulated product and/or precipitation and emptied when required. Hudbay will follow all applicable regulations when dealing with fuel contaminated water.

3.2.3 Sulfuric Acid Storage and Transport

Sulfuric acid totes (1,000 L each) will be stored at Hudbay’s Stall Mill site, approximately 2.4 km from the location of the acid dosing building, prior to being transferred to the ATIA. The totes will be transported via truck, unloaded by a loader with forks and placed in queue in a lined storage area at the ATIA site. When connected to the acid dosing building and in operation, totes will be stored in an enclosed containment unit to capture any leaks or spills and prevent precipitation from entering the containment area (see **Figure 4**).

Figure 4 – Acid Tote Secondary Containment Unit

3.2.4 pH Adjustment Conditions

The installation of the pH Control System is complete and some mitigative application has been conducted. Additional mitigative applications are anticipated throughout the warm weather season, but use will be closely monitored and reassessed to ensure optimal effluent quality and efficiency of acid use.

The pH Control System will be operated under specific pH, temperature, and total ammonia as nitrogen conditions when resulting un-ionized ammonia concentrations trend above internal trigger concentration of 0.40 mg/L. This trigger concentration was selected because it allows Hudbay to make proactive operational decisions before un-ionized concentrations exceed the MDMER Schedule 4 Monthly Mean Limit of 0.50 mg/L.

During discharge periods from the ATIA, daily operational field checks will be performed to assess effluent conditions including un-ionized ammonia concentration in order to determine if pH adjustment is required. If determined to be required, dosing pumps will be set at their lowest rates upon initial start-up and pumping rates will be increased in small increments with pH checks at the siphon discharge location confirming the adjustment until the pH target of 7.0 is reached. During pH adjustment, daily operational field checks will be completed along with any adjustment of acid dosing rates required. Frequency of operational checks may increase if there is uncertainty regarding maintaining a steady pH.

Hudbay anticipates that the pH Control System could be used at any time during periods of discharge to the environment as a mitigation measure. Usage is not expected to be continuous, but rather as required during the specific conditions as described above. As this is a new mitigation measure, there is no historical data to assist with the estimation of acid consumption, and therefore actual acid usage is likely to vary. However, using the anticipated maximum rate of 1,000 mL/min and hypothetical continued use of the acid system for the entire projected operating period (July to mid-October), approximately 1.4 acid totes (1,000 L each) would be consumed per day.

4. Evaluation of Potential Environmental Impacts

AECOM, with input from Hudbay, has evaluated potential environmental impacts to the surrounding environment that could occur because of the construction and operation of the temporary pH Control System at the ATIA. In conducting our assessment, AECOM has considered that the pH Control System proposed for the Project is intended to be a mitigation measure that is strictly designed to improve effluent quality at the ATIA prior to discharging to the environment.

4.1 Topography

The location of the acid dosing building has been previously cleared and levelled and is within an active tailings management facility. Although it is expected that the area may require some minor grading, no significant changes to topography during operation are expected.

Conclusion: As there is no environmental impact associated with topography at the site, no additional mitigation measures need to be considered.

4.2 Soil

4.2.1 Erosion

The location of the acid dosing building has already been cleared and levelled and is covered with crushed rock on an existing tailings dam. Therefore, operation will not include activities that will result in soil erosion.

Conclusion: As there is no environmental impact associated with soil erosion at the site, no addition mitigation measures need to be considered.

4.2.2 Waste Management

Operation of the pH Control System will require the use of smaller mobile equipment (loader, forklift, or truck) for transporting totes, which may result in the generation of small volumes of waste materials in the form of used oil, grease, and rags from minor maintenance activities. Minor amounts of miscellaneous refuse from operation and pump maintenance activities within the acid dosing building may also be generated. Waste totes will also be generated as they are depleted of acid, however only a small number will be generated considering only small amounts of acid will be used as necessary and on a temporary basis.

To prevent adverse effects on soil quality from waste, Hudbay will ensure that waste generated during operation of the pH Control System will be collected in clearly labelled waste bins maintained at the site, and these bins will be emptied on a regular basis for recycling or disposal at a licensed waste disposal facility. Waste oils and other hazardous materials generated, such as lubricants or petroleum products, will be removed by a licensed hazardous materials handler for appropriate disposal or recycling. Waste totes will be relocated to Stall Mill's designated tote area to await pick-up by a recycler.

Conclusion: Provided proper waste management measures are developed and implemented at the site, there will be a negligible environmental impact associated with waste management.

4.2.3 Acid Rock Drainage and Metal Leaching

The pad on which the acid dosing building is located is comprised of various sizes of quarry blast rock, which is confirmed to be non-acid-generating (NAG). Accordingly, there will be no generation of acid rock drainage (ARD).

Conclusion: Given the proper design and materials used in the area there will be a negligible environmental impact associated with ARD and metal leaching.

4.3 Air

4.3.1 Dust

Levelling at the acid dosing building location has already been completed, and therefore the potential for generation of dust during operation of the pH Control System will be limited to the movement of small mobile equipment (for transporting totes) and light duty vehicles, only when the system is in use.

The pH Control System is already located on the ATIA and involves only minor traffic. It is expected that there will be no change in impact from dust in the area associated with its operation.

To help reduce the potential for dust generation, speed limits will be imposed on unpaved roads and tailings dams to minimize the dispersion of road dusts.

Conclusion: There is a negligible environmental impact from dust associated with the implementation of the pH Control System, and no additional mitigation measures need to be considered.

4.3.2 Emissions

Primary sources of emissions, including greenhouse gases, during operation will be limited primarily to vehicle traffic and minor electricity use. During operation, emissions will be generated by small mobile equipment and light duty vehicles as well as electrical emissions from the acid pump operation. As indicated previously, it is expected that there will be minimal traffic and therefore a negligible impact on air quality associated with emissions.

Conclusion: There is a negligible environmental impact from emissions associated with operation of the pH Control System, and no additional mitigation measures need to be considered.

4.3.3 Noise

Typical sources of noise during the operation of the pH Control System will include mobile equipment as mentioned previously and intermittent generator use to power the acid pumps. As the site of the acid dosing building has already been levelled, it is expected that the use of heavy equipment such as graders will be limited and the impact of noise during operation will be negligible.

The pH Control System will be located within the ATIA, approximately 1.8 km away from the nearest residence, and although there is currently little activity on site, there is some noise associated with the operation of vehicles and equipment. During the operation of the pH Control System, it is expected that noise levels will remain the same and/or similar to current noise levels at the ATIA.

Conclusion: There is a negligible environmental impact from noise, and no additional mitigation measures need to be considered.

4.4 Groundwater

Leaks and spills from chemicals (sulfuric acid spillage) and wastes could potentially affect groundwater quality if not addressed appropriately. With the implementation of mitigation measures outlined in **Section 4.2.2** (Waste Management) in addition to using appropriate secondary containment for acid totes, environmental impacts on groundwater quality would be avoided.

No groundwater will be used for the operation of the pH Control System, and therefore there will be no impacts on groundwater quantity associated with its operation.

Conclusion: Provided proper waste management and soil management measures are developed and implemented in relation to the pH Control System, there will be negligible environmental impact associated with groundwater quality and quantity.

4.5 Surface Water

4.5.1 Surface Water Quality

Sulfuric acid will be added to the effluent at the siphon intake location within the ATIA to adjust the pH at the siphon discharge location to a target of 7.0. As discussed in above sections, the acid will be added in small volumes under specific conditions. Although pH adjustment will not reduce the total amount of ammonia species (NH3 + NH4+) in the system, pH adjustment will shift the equilibrium towards the less toxic form (NH4+).

The pH levels in the receiving environment of Anderson Bay (ANB) are generally higher than the target pH of 7.0. A review of historical sampling data (2013 - 2023) at the discharge location indicates that pH values ranged between 6.04 and 9.05, but the pH typically fluctuates between 7.5 and 8.5, with a median value of 7.6. The targeted pH adjustment to 7.0 falls within this typically observed range. So, while most of the ammonia will exist in the non-toxic ammonium form under these circumneutral conditions, we anticipate an increase in the proportion of un-ionized NH3 in the receiving environment due to the slightly higher pH.

PHREEQC geochemical modeling has been performed by AECOM to estimate the potential impacts of sulfuric acid addition on the solubility of metals in the discharge water. A total of five (5) water samples, collected at and in proximity to the discharge location during various sampling events, were selected for this analysis. These samples exhibited a pH range from 7.5 to 7.9. Sulfuric acid was introduced to the solution to lower the pH to align closely with our target of 7.0, and it was assumed that the effluent is in equilibrium with atmospheric CO_2. Ferrihydrite and diaspore were considered most likely to precipitate and therefore were selected as primary solubility-controlling phases for iron and aluminum concentrations. Preliminary results suggest that SO4 concentrations increased approximately 5%-10%, depending on initial pH and alkalinity condition. Most minerals will remain under saturated conditions before and after the proposed pH adjustment. This implies that the solubility of metals should not be significantly altered. Typically, metals tend to become more soluble under highly acidic conditions (pH<5) and tend to desorb from iron/aluminum oxide and clay minerals. However, the proposed minor pH adjustment (from around 7.8 to 7.0) is unlikely to significantly enhance the mobility of metals.

Results from historical rainbow trout and *Daphnia magna* acute lethality toxicity tests carried out on effluent samples obtained from the Anderson TIA indicate that the historical and existing pH conditions, (ranging between 6.04 and 8.96) do not induce mortality in aquatic organisms. This evidence suggests that the effluent under these pH conditions the effluent is not harmful to the aquatic life.

Hudbay will implement more frequent monitoring and toxicity testing at the receiving environment location (ANB) to ensure that the acid injection is not having an adverse impact on downstream water quality. This monitoring will be in addition to the already robust monitoring at the discharge location (AND) as per EAL No. 3263 and will supplement any data that is already obtained through compliance monitoring. The design of the proposed additional monitoring and sampling program is inherently adaptive and will accommodate daily operational changes and conditions.

Daily operational field checks are performed by Hudbay to ensure continued compliance with the pH range identified in EAL 3263 and the *MDMER*. This includes morning and afternoon checks on field pH, temperature, and ammonia/zinc at the Anderson TIA discharge location (AND). This field monitoring program will be extended to the receiving environment of Anderson Bay (ANB) to detect any immediate changes. For field un-ionized ammonia concentrations, a Hach DR900 multiparameter portable colorimeter alongside the Nitrogen, Ammonia-Salicylate High Range Method will be used in the field. Hudbay will adhere to a precautionary approach, using 0.50 mg/L un-ionized ammonia as the threshold. If un-ionized ammonia levels approach this benchmark, Hudbay will cease the ATIA discharge to prevent potential rainbow trout toxicity.

Sampling frequency: AECOM recommends that Hudbay implement a robust monitoring program at ANB, which would involve collection of water samples on weekly basis during discharge as well as sampling one and three weeks following the discharge period. Sampling frequency can then be reduced to bi-weekly if no issues are observed at ANB during this period. Frequent field operational checks (i.e., pH, temperature, ammonia, zinc) will be conducted at ANB following the commencement of the pH control system. This approach will facilitate timely detection of potential issues.

Sampling parameters will include:

- Field parameters (pH, Temperature, DO, ORP, Conductivity and TDS).
- Anions: alkalinity, chloride, sulphate, phosphorus
- Nitrogen Species: NO3, NO2, NH4+NH3
- Cyanide: WAD, SAD, Cyanate, Thiocyanate (SCN) and free cyanide.
- Total and Dissolved Metals

Acute Toxicity Testing: Prior to discharge and commencement of the pH control system, up to three pass/fail (P/F) toxicity tests using rainbow trout will be conducted over subsequent weeks at ANB to establish baseline condition. If water samples from either AND or ANB fail the P/F toxicity test or there is concern that field measured ammonia concentrations are approaching to ammonia threshold, Hudbay will stop discharge from the Anderson TIA and dose-response (LC50) toxicity tests using rainbow trout will be conducted to assess the environmental impacts to receiving environment.

Potential spills and leaks from chemicals and waste that could affect surface water quality have been mitigated using secondary containments as per details outlined in **section 3.2.2** (Electrical Source) and **3.2.3** (Sulfuric Acid Storage and Transport).

Conclusion: The addition of acid to the ATIA effluent will improve water quality prior to discharge to environment. Provided the mitigation measures described above are implemented, there will be negligible environmental impact associated with surface water quality.

4.5.2 Surface Water Use

No surface water will be used for the operation of the pH Control System, and therefore there will be no risk of environmental impact on surface water use associated with its implementation and operation.

4.5.3 Ore and Waste Management

Like soil and groundwater, activities such as the handling of waste or chemical leaks/spills are the activities of greatest potential risk with respect to surface water quality if not properly managed. With the implementation of mitigation measures outlined in **Section 4.2.2** (Waste Management) environmental impacts on surface water quality would be avoided.

Conclusion: Provided proper waste and chemical management are developed and implemented, there will be a negligible environmental impact on surface water associated with the implementation and operation of the pH Control System.

4.5.4 Wastewater Management

No wastewater will be generated from the operation of the pH control system, and therefore there is no risk of environmental impact associated with the management of wastewater on-site, and no additional mitigation measures need to be considered.

4.6 Vegetation

4.6.1 Clearing

The location of the pH Control System is within the existing footprint of the ATIA so no additional clearing is required for its construction or operation.

Conclusion: There is no risk of environmental impact associated with the clearing of vegetation, and no additional mitigation measures need to be considered.

4.6.2 Dust Deposition

Dust generated during the operation of the pH Control System has the potential to affect vegetation in the surrounding environment through the accumulation of road dust and interference with photosynthetic ability. With the implementation of mitigation measures outlined in **Section 4.3.1** (dust), the environmental impacts to vegetation resulting from dust deposition are expected to be negligible.

Conclusion: Provided controls for road dust mitigation are in place, there will be a negligible risk of environmental impact associated with dust deposition on local vegetation.

4.7 Wildlife

4.7.1 Loss of Habitat

No additional clearing will be required for the operation of the pH Control System and as a result, no impact on wildlife, including migratory and nesting birds, is expected.

As the pH Control System is located within the existing footprint of the ATIA, it is expected that critical wildlife habitat will not be affected by its operation.

Conclusion: There is no risk of environmental impact associated with loss of wildlife habitat, and no additional mitigation measures need to be considered.

4.7.2 Noise

The ATIA has been in operation for many years, and it is anticipated that local wildlife are already accustomed to some level of noise based on the activity that has occurred in the area. No specific or critical wildlife habitat has been identified in the area.

Conclusion: There will be a negligible risk of environmental impact associated with noise on local wildlife.

4.7.3 Vehicle Collisions

As indicated in previous sections, it is expected that there will be no significant increase in traffic at the ATIA due to the implementation of the pH Control System, and as a result, there will be no significant increase in the number of opportunities for animal strikes to occur. Further, Hudbay's experience in the area to date indicates that wildlife collisions are rare.

Conclusion: There is no risk of environmental impact associated with loss of wildlife due to vehicle collisions, and no additional mitigation measures need to be considered.

4.8 Aquatic Resources

4.8.1 Fish and Fish Habitat

The ATIA discharges into Anderson Creek which flows into Anderson Bay of Wekusko Lake. As this creek is very shallow and is only subject to seasonal flows, it provides marginal to no fish habitat and likely contains no large-bodied fish. Although road dust and potential leaks and spills from wastes and acid totes may pose a risk to aquatic species in Anderson Creek, mitigation measures previously proposed will address the off-site migration of dust, wastes, and spills during operation. Hudbay also conducts sampling pursuant to EAL No. 3263 and the *MDMER* to ensure effluent quality is within all regulatory limits for the protection of fish and fish habitat. Therefore, the potential impact to fish and fish habitat in the region has been determined to be insignificant.

Conclusion: Provided proper mitigation measures are developed and implemented to control dust, wastes and spills at the site and the fact that the pH Control System aims to improve effluent quality, there will be a negligible risk of environmental impact associated with fish and fish habitat with the implementation and operation of the system.

4.8.2 Aquatic Invertebrates

As indicated in **Section 4.8.1** (Fish and Fish Habitat), mitigation measures have been proposed that will address the off-site migration of dusts, wastes and spills, and ensure optimal effluent quality during operation of the pH Control System. As a result, the potential impact to sediment quality and aquatic invertebrates in local waterbodies has been determined to be insignificant.

Conclusion: Provided proper mitigation measures are developed and implemented to control dust, wastes and spills at the site, there will be a low risk of environmental impact associated with sediment quality and aquatic invertebrates.

4.9 Socio-Economic Effects

4.9.1 Land and Resource Use

The pH Control System is situated within the ATIA, which is owned and operated by Hudbay. There is currently no harvesting, trapping, or recreational or commercial fishing occurring in the area. The implementation and operation of the pH Control System will not have any impact on these activities.

4.9.2 Heritage Resources

Heritage assessments have previously been completed and no additional clearing or blasting is planned for the operation of the pH Control System. There is no environmental risk associated with heritage resources, and no additional mitigation measures need to be considered.

4.9.3 Aesthetics

The pH Control System is situated within the upstream side of the east dam of the ATIA and is not visible from public roads (PTH 392). As there are no components that alter the aesthetics of the site, there is no environmental risk associated with site aesthetics. No additional mitigation measures need to be considered.

4.9.4 Effects on Indigenous Peoples

The pH Control System will be located within the ATIA footprint, which is already not available for use by Indigenous people, nor is it located within sufficient proximity to any First Nations communities or heritage locations.

4.10 Accidents and Malfunctions

The following sections provide additional details on precautionary measures that will be implemented by Hudbay to minimize the potential for accidents and malfunctions during operation of the pH Control System.

4.10.1 Spills

Environmental effects may occur due to fuel, lubricant, oil and hydraulic fluid spills from small mobile equipment and operation of the generator as well as from spills from the sulfuric acid totes. An accidental release of hazardous materials and/or equipment fluids could occur from improper storage and handling procedures or vehicle maintenance. Accidental releases have the potential to affect air, surface water, groundwater, and soils, with consequential effects on vegetation, aquatic resources, and possible human health and safety.

The following standard procedures will be employed to prevent spills from occurring during the construction and operational phases of the pH Control System:

- When servicing requires drainage or pumping of lubricating oils or other fuels to or from equipment, a groundsheet of suitable material and size will be spread on the ground to catch all fluid in the event of a leak or spill. An adequate supply of suitable absorbent material and any other supplies and equipment necessary to immediately clean up spills will also be available.
- The generator will always be kept in a spill tray and monitored regularly for spills and leaks.
- Acid totes will only be transported from storage as needed to minimize handling. During transport, appropriate materials (neutralizing agent) and personnel will be available in the event of a spill.

- Storage and disposal of liquid wastes and filters from equipment maintenance, and any residual material from spill clean-up will be contained in an environmentally safe manner and in accordance with any existing regulations.
- Waste oils, fuels, and hazardous wastes (if any) will be handled in a safe manner. Staff will be required to transport, store, and handle all such substances as recommended by the suppliers and/or manufacturers and in compliance with applicable Federal, Provincial, and Municipal regulations.
- Oils, acid totes or other hazardous materials will be stored in designated areas only.
- Acid totes will be stored in an enclosed secondary containment unit when in use.
- Storage sites will be inspected periodically for compliance.
- Personnel on-site will be trained in how to deal with spills, including knowledge of how to properly deploy site spill kit materials.
- Acid neutralizing agent will be kept on site at the ATIA in the event of an acid spill.
- Service and repairs of equipment shall only be performed by trained personnel.
- Vehicles and equipment will be maintained to minimize leaks. Regular inspections of hydraulic fuel systems on machinery will be completed on a routine basis; when detected, leaks will be repaired immediately.
- The Province will be notified immediately if a reportable spill occurs.

With the implementation of the above mitigation measures as necessary and assuming the implementation of safe work practices, the risk of spills is considered appropriately mitigated.

4.10.2 Fire and Explosion

The presence of mechanical equipment, fuels, and other hazardous materials creates a potential for fires and explosions. Such incidents can harm on-site personnel, cause equipment damage, and lead to a release of contaminants, resulting in consequent effects to other environmental components (air, surface water, groundwater, flora, fauna, aquatic resources, and aesthetics).

All necessary precautions will be taken to prevent fire hazards throughout operation; including but not limited to:

- All flammable waste will be removed on a regular basis and disposed of at an appropriate disposal site.
- Appropriate fire extinguisher(s) will be available on site. Such equipment will comply with and be maintained to the manufacturers' standards.
- Storage and use of hazardous materials, including flammable waste, will follow regulatory requirements.
- All on-site fire prevention/response equipment will be checked on a routine basis, in accordance with local fire safety regulations, to ensure the equipment is always in proper working order.
- Greasy or oily rags or materials subject to spontaneous combustion will be deposited and stored in appropriate receptacles. This material will be removed from the site on a regular basis and be disposed of at an appropriate waste disposal facility.
- Smoking will be restricted to designated areas.

With the measures outlined above, and assuming implementation of typical safe work practices, the risk of fires and explosions is assessed to be appropriately mitigated.

5. Closure and Decommissioning

There is no specific timeline for the closure and decommissioning of the pH Control System, and it will remain in place throughout the operation of the ATIA to provide for contingency treatment of effluent on an "as required" basis. Although the acid dosing building will remain on the site for future use, upon conclusion of current use other components of the acid dosing system (pipes, pumps) will be disconnected and the power supply deactivated, with the possibility of reconnecting these components during future discharge periods, as needed.

Hazardous materials, such as the sulfuric acid totes and fuel storage containers, will be removed from the site and stored at the Stall Mill or other suitable location. Following the removal of the materials and Hudbay's determination that the pH Control System is no longer needed on a permanent basis, the site will be restored to its prior condition to the extent possible.

6. Summary

In summary, Hudbay will be implementing a new mitigation measure at the ATIA in the form of a temporary pH Control System in order to ensure compliance with regulatory limits for un-ionized ammonia and prevent future exceedances. Based on our review of the Project components and associated environmental assessment, AECOM has concluded that with the implementation of standard operating and mitigation measures, the residual environmental impacts associated with the construction and operation of the pH Control System will be negligible in magnitude and therefore not likely to cause significant adverse environmental effects.

Thank you, and please contact me directly with any questions or comments.

Sincerely,

AECOM Canada Ltd.

[redacted]

Cliff Samoiloff, B.Sc., EP(CEA)
Project Manager and Senior Scientist
(204) 223-3254

CS:rz