

## 2019 Qikiqtani Inuit Association and Nunavut Water Board Annual Report for Operations

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April 30, 2020 | ᕈᕋᕐ 30, 2020



# Baffinland Iron Mines Corporation

## Mary River Project

### 2019 QIKIQTANI INUIT ASSOCIATION (QIA) AND NUNAVUT WATER BOARD (NWB) ANNUAL REPORT FOR OPERATIONS

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		A. McKenzie	C. Murray
<b>Date</b>	<b>Rev.</b>	<b>Prepared By</b>	<b>Reviewed and Approved By</b>

**TABLE 0: REPORT SUBMISSION SUMMARY**

Year of Annual Report	2019
Annual Report Submission Date:	April 30, 2020
Name and contact information of the Baffinland representative responsible for the preparation and approval of the Annual Report.	<b>Christopher Murray</b> <a href="mailto:Christopher.murray@baffinland.com">Christopher.murray@baffinland.com</a> T: +1 416 364 8820 x5072 C: +1 647 472 9842
The name and contact information of the Baffinland representative that QIA can contact should it have any questions or comments regarding the Annual Report	<b>Christopher Murray</b> <a href="mailto:Christopher.murray@baffinland.com">Christopher.murray@baffinland.com</a> T: +1 416 364 8820 x5072 C: +1 647 472 9842

## **2019 QIKIQTANI INUIT ASSOCIATION (QIA) AND NUNAVUT WATER BOARD (NWB) ANNUAL REPORT FOR OPERATIONS**

### EXECUTIVE SUMMARY

This report to the Qikiqtani Inuit Association (QIA) and the Nunavut Water Board (NWB) has been prepared to summarize the 2019 Mary River Project (the Project) activities and monitoring conducted under Baffinland Iron Mines Corporation's (Baffinland) Type 'A' Water Licence - 2AM-MRY1325 – Amendment No. 1 (Type 'A' Water Licence) and the Commercial Lease No. Q13C301 (Commercial Lease) between the QIA and Baffinland. A separate annual report has been prepared for the QIA and NWB to summarize the 2019 exploration and geotechnical activities conducted for the Mary River Project within the scope of Baffinland's Type 'B' Water Licence - 2BE-MRY1421 (Type 'B' Water Licence) and Commercial Lease, and a separate report for the QIA and NWB to summarize the 2019 exploration activities conducted for the Ege Bay Exploration Program within the scope of Baffinland's Type 'B' Water Licence 2BE-EQE1926 and Land Use Licence QL2-1910

During 2019, mining operations at Deposit No. 1 continued to increase and produced a total of 5.7 million tonnes (Mt) of ore, representing a production increase from 5.6 Mt of ore produced in 2018. Ore produced by mining operations at the Mary River Mine Site (Mine Site) was transported by ore haul trucks along the Milne Inlet Tote Road (Tote Road) and stockpiled at Milne Port. During the 2019 shipping season (July to October), a total of 5.86 Mt of ore was shipped from the Project's Milne Port to international markets. In 2019, marine ore shipments involved 82 individual ore carrier vessel voyages during the open-water shipping season. Following the shipping season, ore continued to be stockpiled at Milne Port to be shipped to market in 2020.

Mining operations along with development of Project infrastructure continued throughout 2019. A description of the key Project activities executed under the Type 'A' Water Licence and the Commercial Lease are presented below by Project area.

#### Mine Site

At the Mine Site, key Project activities included:

- Mining of Deposit No. 1 and the crushing and stockpiling of ore at the Mine Site Crusher Facility;
- Extraction of aggregates from the QMR2 Quarry;
- Continued deposition of non-hazardous wastes at the Mine Site Non-Hazardous Waste Landfill Facility (Landfill Facility);
- Continued deposition of waste rock generated by Project operations at the Waste Rock Facility;
- Maintenance of site surface water drainage infrastructure (i.e. culverts) to address sedimentation concerns and improve surface water drainage;

- Continued construction and assembly of the new 800-Person Camp (Sailiivik Camp) and supporting infrastructure;
- Installation and commissioning of an additional fuel tank (15 ML) at the Mine Site Bulk Fuel Storage Facility;
- Improvements to the Crusher Facility's surface water management infrastructure, including upgrades to the perimeter ditch network and the Crusher Facility Pond spillway; and,
- Continued implementation of corrective actions in response to the concerns identified at the Waste Rock Facility during 2017, including the continued operation of a dedicated water treatment plant and expansion and repairs of the waste rock facility pond to ensure effluent water quality compliance.

### Tote Road

Along the Tote Road, key Project activities included:

- The transportation of ore using ore haul trucks from the Mine Site to Milne Port for stockpiling;
- Trucking of fuel and other supplies from Milne Port to the Mine Site to support Project operations and development;
- Continued maintenance of the Tote Road to improve surface water drainage and address safety and operational concerns, including works proposed in the Tote Road Earthworks Execution Plan (TREETP) and select implementation of the Hatch (2013) design;
- Implementation of a freshet management and monitoring plan, involving the implementation of preventative and corrective measures (i.e. check dams, silt fences, excavating culverts of snow and ice, etc.) to address sedimentation concerns during high flow periods;
- Continued development of the Km 97 Borrow Source to support road maintenance; and,
- The application of calcium chloride and water for dust-suppression purposes, as well as a trial application of a new dust suppression alternative under the commercial name DustStop.

### Milne Port

At Milne Port, key Project activities included:

- Continued stockpiling of ore at the Milne Port Ore Stockpile Facility prior to and following the 2019 shipping season;
- Marine shipment of ore to international markets via the Milne Port shiploader and ore carrier vessels;
- Extraction of aggregates from the Q1 Quarry;
- Milne Port Ore Stockpile #1 expansion and water management structure upgrades;

- Continued constructions of laydowns and associated surface water management infrastructure, to store equipment and supplies required for Project operations and development; and,
- Multiple sealifts, including the backhaul of equipment and waste to Southern Canada and the delivery of fuel, equipment, consumables and materials to support continued Project operations and development.

#### Waste Rock Facility Management

During 2019, Baffinland continued to characterize Deposit No. 1 waste rock generated by Project operations and optimize waste rock deposition and management strategies to address outstanding concerns identified at the Waste Rock Facility (WRF) during 2017 and 2018. Waste rock monitoring and management activities completed in 2019 included:

- Operational geochemical testing of waste rock generated by mining operations at Deposit No. 1;
- Continual monitoring of the eight (8) installed thermistor series at varying depths and locations throughout the WRF to characterize the thermal conditions of the Facility;
- Continued optimization of the Project's near-term waste rock deposition and management strategies, and;
- Submission of the Phase 1 Waste Rock Management Plan, Revision 2 –(BAF-PH1-830-P16-0029), detailing the results of monitoring and modelling activities in 2019, and the application of additional methods for waste rock characterization.

Operational testing of waste rock generated by mining operations at Deposit No. 1 continued to be conducted throughout 2019 to inform the management and deposition of potentially acid generating (PAG) and nonacid generating (NAG) waste rock at the Project. The testing methods employed are outlined in the Project's Life-of-Mine Waste Rock Management Plan (BAF-PH1-830-P16-0031) and involve the on-site sampling and analysis of blast hole cuttings for total sulphur content and supporting Acid Base Accounting (ABA) parameters. The operational testing results provide the basis for determining the appropriate waste rock classification: PAG or NAG. Waste rock analyzed to have a sulphur concentration less than 0.20% was classified as NAG material while waste rock analyzed to have a sulphur concentration greater than 0.20% was classified as PAG material. All PAG waste rock generated in 2019 was deposited at the WRF in accordance with the Phase 1 Waste Rock Management Plan Revision 1 (Baffinland, 2019), and the Interim Waste Rock Management Plan (Baffinland, 2019) issued in December 2018 and March 2019.

In 2019 Baffinland continued to investigate the source of seepage at the WRF pond, and determined that the liner integrity had likely been compromised. As a result, Baffinland executed the repair and expansion of the WRF Pond, re-lining the existing pond section and expanding the capacity of the pond. While final liner installation was still being completed at the end of 2019, all work was completed in early 2020 to restore the integrity and operation of the pond.

Baffinland continues to remain committed to maintaining compliance in the management of waste rock and effluent at the Waste Rock Facility. Industry best practices and procedures planned for the Waste Rock Facility are detailed in the Project's most recent revisions of the Phase 1 Waste Rock Management Plan (Baffinland, 2019), MDMER Emergency Response Plan and Fresh Water Supply, Sewage and Wastewater Management Plan. Key corrective actions planned for 2020 include ongoing waste rock studies to further optimize the Project's waste rock and ARD/ML management strategies.

#### Key Modifications to Project Infrastructure

During 2019, Baffinland continued to develop the Project and submitted two modification applications to the NWB, under Section G of the Type 'A' Water Licence, to upgrade and improve Project infrastructure at Milne Port and the Mine Site. Approved modifications implemented at the Project in 2019 included:

- Modification No. 4 - Continued construction of the new 800-Person Camp (Sailiivik Camp) and supporting infrastructure at the Mine Site;
- Modification No. 8 – The expansion of the Waste Rock Facility, including the expansion and repair of the Waste Rock Facility Pond and perimeter ditches;
- Modification No. 9 – Expansion of the Milne Port Ore Stockpile Facility's surface water management infrastructure, including new ponds and ditching;
- Modification No. 10 – Expansion of the Landfill Facility and construction of a treated sewage effluent pipeline to service the new 800-Person Camp (Sailiivik Camp);
- Modification No.11 – Installation of an Incineration Unit at Milne Port's 380-Person Camp; and,
- Modification No.12 – Expansion of the Milne Port Ore Stockpile #1 and Water Management Structures.

#### Spills

During 2019, twenty-five (25) spills were reported to the Northwest Territories-Nunavut (NT-NU) Spill Line, CIRNAC and QIA by the Project. Overall, this represented a frequency decrease of 28% when compared to the frequency of reportable spills in 2018. In addition to the original spill report submitted within 24 hours of each spill event in 2019, a detailed follow-up report was submitted within thirty (30) days of each reported spill. Baffinland continued to investigate the basic causes of all spills that occurred on site in 2019 so that effective long-term corrective actions could be implemented to reduce the frequency of spills at Project sites.

#### Water Use and Freshwater Monitoring

Under the authorization of the Type 'A' Water Licence, freshwater was withdrawn during 2019 to sustain three (3) key activities at the Project: potable water supply (domestic), dust suppression, and other industrial purposes. During 2019, total daily water volume withdrawal limits, stipulated in the Type 'A' Water Licence, for dust suppression purposes were not exceeded at approved Project water sources, with

the exception of three (3) dust suppression water sources along the Tote Road during the summer months. Although the total daily water withdrawal limit for Camp Lake (355.4 m<sup>3</sup>/day) was not exceeded in 2019, there were twelve (12) incidents where the daily water volume withdrawn for domestic purposes exceeded Camp Lake's domestic daily water withdrawal limit (203.8 m<sup>3</sup>/day). These twelve (12) incidents, detailed in Table 4.1, are believed to be a result of the mis-categorization of water volumes withdrawn for industrial purposes and operator error due to raw water capacity constraints. To prevent similar incidents from re-occurring, Baffinland plans to improve the documentation and categorization of water volumes withdrawn and optimize tracking for operators to support Project activities. In addition, there was one (1) incident where the daily water volume withdrawn for industrial purposes exceeded the Km 32 Lake daily water withdrawal limit (67.5 m<sup>3</sup>/day). The incident was the result of higher water use for ice crossing construction on that day. No other water withdrawal incidents or exceedances for domestic and industrial water uses were noted in 2019.

Throughout 2019, Baffinland continued to implement the Surveillance Network Program (SNP) outlined in Schedule I of the Type 'A' Water Licence, analyzing effluents (i.e. treated sewage, treated oily water) discharged to the receiving environment and monitoring surface water quality within specific Project areas (i.e. surface water runoff downstream of Project areas). Based on a review of 2019 SNP results reported to the NWB, CIRNAC and the QIA, exceedances of applicable discharge criteria in 2019 involved mainly surface water runoff and effluents with elevated total suspended solids (TSS) levels. In each case, appropriate control measures were implemented to restore TSS levels below applicable discharge criteria. Baffinland continues to assess and implement the appropriate corrective and mitigation measures to address ongoing sedimentation concerns at the Project.

In addition to the SNP, ongoing environmental monitoring and effects studies, including the Project's Aquatic Effects Monitoring Plan (AEMP), were conducted during 2019 in accordance with the commitments made in the ERP, and the Final Environmental Impact Statement (FEIS) approved under the Project Certificate.

#### Community Consultations and Engagement

Throughout 2019, Baffinland continued to consult with the North Baffin communities and organizations, regarding construction activities at site, operations and the 2019 shipping season, progress regarding employment from the North Baffin communities, environmental monitoring activities and results, and future phases of the Project. Baffinland remains committed to meaningful engagement with stakeholders potentially affected by the Project, applicable regulatory agencies, and the general public.

#### Summary of Plans for 2020

The 2020 Work Plan was prepared and provided by Baffinland to relevant parties on November 1, 2019 as required under Section 6.1 of the Commercial Lease and under Part J, Item 3 of the Type 'A' Water Licence, for the purposes of an Annual Security Review for activities undertaken on an annual basis.



The 2020 Work Plan described the planned development and operation of the mine, ore crushing and land transportation, stockpiling and marine shipment of ore, and the continued development and construction of infrastructure required at Milne Port, the Tote Road, and the Mine Site.

The Project's Phase 2 Expansion Proposal continues to proceed through the review and approvals process facilitated by the NIRB and NWB. Project environmental monitoring programs prescribed by the Project Certificate, water licences, authorizations, management plans and environmental effects monitoring plans will continue through 2020.













## **ASSOCIATION INUITE DU QIKIQTANI (AIQ) ET OFFICE DES EAUX DU NUNAVUT (OEN) : RAPPORT ANNUEL D'ACTIVITÉS 2019**

### RÉSUMÉ EXÉCUTIF

Le présent rapport à l'intention de l'Association inuite du Qikiqtani (AIQ) et de l'Office des eaux du Nunavut (OEN) a été préparé pour résumer les activités et la surveillance du projet de la rivière Mary en 2019 (le projet) menées en vertu du permis d'utilisation des eaux de type « A » de la Baffinland Iron Mines Corporation (Baffinland) – 2AM-MRY1325 – Modification n° 1 (permis d'utilisation des eaux de type « A ») et du bail commercial n° Q13C301 (bail commercial) entre l'AIQ et Baffinland. Un rapport annuel distinct a été préparé pour l'AIQ et l'OEN afin de résumer les activités d'exploration et de géotechnique menées en 2019 pour le projet de la rivière Mary dans le cadre du permis d'utilisation de l'eau de type « B » de Baffinland – 2BE-MRY1421 (permis d'utilisation de l'eau de type « B ») et du bail commercial, et un rapport indépendant pour l'AIQ et l'OEN résumant les activités d'exploration menées en 2019 pour le programme d'exploration de la baie d'Ege dans le cadre du permis d'utilisation de l'eau de type « B » de Baffinland 2BE-EQE1926 et du permis d'utilisation des terres QL2-1910.

En 2019, les opérations minières du gisement n° 1 ont continué à augmenter et ont produit un total de 5,7 millions de tonnes (Mt) de minerai, ce qui représente une augmentation de la production par rapport aux 5,6 Mt de minerai produites en 2018. Le minerai produit par les opérations minières du site minier de Mary River (site minier) a été transporté par des camions de transport de minerai le long de la route de Milne Inlet Tote (chemin de portage) et stocké au port de Milne. Pendant la saison de navigation de 2019 (juillet à octobre), un total de 5,86 Mt de minerai ont été expédiées du port de Milne, dans le cadre du projet, vers les marchés internationaux. En 2019, les expéditions maritimes de minerai ont mobilisé 82 navires transporteurs de minerai pendant la saison de navigation en eau libre. Après la saison de navigation, le minerai a continué d'être stocké au port de Milne pour être expédié sur le marché en 2020.

Les opérations minières, ainsi que le développement des infrastructures du projet, se sont poursuivies tout au long de l'année 2019. Une description des principales activités du projet réalisées dans le cadre du permis d'eau de type « A » et du bail commercial est présentée ci-dessous par zone de projet.

#### Site minier

- Sur le site minier, les principales activités du projet ont été les suivantes:
- L'exploitation du gisement n° 1 et le concassage et le terril de minerai dans l'installation de concassage du site minier;
- Extraction des agrégats de la carrière QMR2;
- Poursuite du dépôt de déchets non dangereux à la décharge de déchets non dangereux du site minier (décharge);
- Poursuite du dépôt des stériles générés par les opérations du projet à l'installation de traitement des stériles;



- Entretien de l'infrastructure de drainage des eaux de surface du site (c'est-à-dire des ponceaux) pour répondre aux préoccupations en matière de sédimentation et améliorer le drainage des eaux de surface;
- Poursuite de la construction et de l'assemblage du nouveau camp de 800 personnes (camp de Sailiivik) et de l'infrastructure de soutien;
- Installation et mise en service d'un réservoir de carburant supplémentaire (15 millions de litres) dans l'installation de stockage de carburant en vrac du site minier;
- Amélioration de l'infrastructure de gestion des eaux de surface de l'installation de broyage, y compris la modernisation du réseau de fossés périphériques et du déversoir du bassin de l'installation de broyage; et
- Poursuite de la mise en œuvre de mesures correctives en réponse aux préoccupations identifiées à l'installation de traitement des stériles en 2017, y compris la poursuite de l'exploitation d'une station de traitement des eaux dédiée et l'agrandissement et la réparation du bassin de l'installation de traitement des stériles pour assurer la conformité de la qualité des eaux de suintement.

#### Chemin de portage

- Le long du chemin de portage, les principales activités du projet ont été les suivantes:
- Le transport du minerai à l'aide de camions de transport de minerai du site minier au port de Milne pour le stockage;
- Le transport par camion de carburant et d'autres fournitures du port de Milne au site minier pour soutenir les opérations et le développement du projet;
- La poursuite de l'entretien du chemin de portage pour améliorer le drainage des eaux de surface et répondre aux préoccupations en matière de sécurité et d'exploitation, y compris les travaux proposés dans le plan d'exécution des travaux de terrassement du chemin de portage (TREEP) et la mise en œuvre sélective de la conception de l'entrée (2013);
- Mise en œuvre d'un plan de gestion et de surveillance des crues, impliquant la mise en œuvre de mesures préventives et correctives (c'est-à-dire vérification des barrages, clôtures anti-érosion, excavation des ponceaux de neige et de glace, etc.) pour répondre aux préoccupations en matière de sédimentation pendant les périodes de fort débit;
- Poursuite du développement de la source d'emprunt du km 97 pour soutenir l'entretien des routes; et
- L'application de chlorure de calcium et d'eau à des fins de suppression des poussières, ainsi qu'une application expérimentale d'une nouvelle alternative de suppression des poussières sous le nom commercial DustStop.

### Port de Milne

- Au port de Milne, les principales activités du projet ont été les suivantes :
- Poursuite du stockage de minerai à l'installation de stockage de minerai du port de Milne avant et après la saison de navigation de 2019;
- Expédition maritime de minerai vers les marchés internationaux via le chargeur du port de Milne et les navires transporteurs de minerai;
- Extraction d'agrégats de la carrière Q1;
- Expansion du terril de minerai du port de Milne n° 1 et modernisation de la structure de gestion de l'eau;
- Poursuite de la construction d'aires de repos et de l'infrastructure de gestion des eaux de surface associée, afin de stocker le matériel et les fournitures nécessaires à l'exploitation et au développement du projet; et
- Plusieurs transferts maritimes, y compris le transport de matériel et de déchets vers le sud du Canada et la livraison de carburant, d'équipement, de consommables et de matériaux pour soutenir les opérations et le développement du projet.

### Gestion des installations de traitement des stériles

En 2019, Baffinland a continué à caractériser les stériles du dépôt n°1 générés par les opérations du projet et à optimiser les stratégies de dépôt et de gestion des stériles pour répondre aux préoccupations en suspens identifiées à l'installation de gestion des stériles (IGS) en 2017 et 2018. Les activités de surveillance et de gestion des stériles achevées en 2019 comprenaient :

- Essais géochimiques opérationnels des stériles générés par les opérations minières du gisement n° 1;
- Surveillance continue des huit (8) séries de thermistances installées à différentes profondeurs et en différents endroits de l'IGS pour caractériser les conditions thermiques de l'installation;
- L'optimisation continue des stratégies de dépôt et de gestion des stériles à court terme du projet; et
- Soumission du plan de gestion des stériles de la phase 1, révision 2 (BAF-PH1-830-P16-0029), détaillant les résultats des activités de surveillance et de modélisation en 2019 et l'application de méthodes supplémentaires pour la caractérisation des stériles.

Les essais opérationnels des stériles générés par les opérations minières du gisement n° 1 se sont poursuivis tout au long de 2019 afin d'éclairer la gestion et le dépôt des stériles potentiellement générateurs d'acide (PGA) et non générateurs d'acide (non-GA) au projet. Les méthodes d'essai utilisées sont décrites dans le plan de gestion des stériles miniers du projet (BAF-PH1-830-P16-0031) et

comprennent l'échantillonnage et l'analyse sur place des déblais de forage pour la teneur totale en soufre et les paramètres de détermination acide-base (DBA) : PGA ou non-GA. Les stériles analysés pour avoir une concentration en soufre inférieure à 0,20 % ont été classés dans la catégorie des matériaux non-GA, tandis que les stériles ayant une concentration en soufre supérieure à 0,20 % ont été classés dans la catégorie des matériaux PGA. Tous les stériles PGA produits en 2019 ont été déposés à l'IGS conformément à la phase 1 du plan de gestion des stériles, révision 1 (Baffinland, 2019), et au plan de gestion provisoire des stériles (Baffinland, 2019) publié en décembre 2018 et mars 2019.

En 2019, Baffinland a continué à enquêter sur la source des fuites du bassin de l'IGS, et a déterminé que l'intégrité du revêtement avait probablement été compromise. En conséquence, Baffinland a procédé à la réparation et à l'expansion du bassin de l'IGS, en revêtant à nouveau la section existante du bassin et en augmentant sa capacité. Alors que l'installation finale du revêtement était encore en cours à la fin de 2019, tous les travaux ont été achevés au début de 2020 pour restaurer l'intégrité et le fonctionnement du bassin.

Baffinland continue de s'engager à maintenir la conformité dans la gestion des stériles et des effluents de l'installation de stériles. Les meilleures pratiques et procédures de l'industrie prévues pour l'installation de stériles sont détaillées dans les plus récentes révisions du projet de la phase 1 du plan de gestion des stériles (Baffinland, 2019), du plan d'intervention d'urgence du MDMER et du plan de gestion de l'approvisionnement en eau douce, des eaux usées et des eaux d'égout. Les principales mesures correctives prévues pour 2020 comprennent des études en cours sur les stériles afin d'optimiser davantage les stratégies de gestion des stériles et des lixiviation des métaux/DRA du projet.

#### Principales modifications apportées à l'infrastructure du projet

En 2019, Baffinland a continué à développer le projet et a soumis deux demandes de modification à l'OEN, en vertu de la section G du permis d'utilisation de l'eau de type « A », afin de moderniser et d'améliorer les infrastructures du projet au port de Milne et sur le site minier. Les modifications approuvées mises en œuvre dans le cadre du projet en 2019 comprennent :

- Modification n° 4 : poursuite de la construction du nouveau camp de 800 personnes (camp de Sailiivik) et des infrastructures de soutien sur le site minier;
- Modification n° 8 : l'agrandissement de l'installation de gestion des stériles, y compris l'agrandissement et la réparation du bassin de l'installation de gestion des stériles et des fossés périphériques;
- Modification n° 9 : extension de l'infrastructure de gestion des eaux de surface de l'installation de stockage de minerai du port de Milne, y compris la construction de nouveaux bassins et de fossés;
- Modification n° 10 : agrandissement de la décharge et construction d'une conduite d'évacuation des eaux usées traitées pour desservir le nouveau camp de 800 personnes (camp de Sailiivik);
- Modification n° 11 : installation d'une unité d'incinération au camp de 380 personnes du port de Milne; et

- Modification n° 12 : extension du terril de minerai du port de Milne n° 1 et des structures de gestion de l'eau.

### Déversements

En 2019, vingt-cinq (25) déversements ont été signalés à la ligne de déversement Territoires du Nord-Ouest : Nunavut (NT-NU), à RCAANC et à l'AIQ par le Projet. Dans l'ensemble, ce chiffre représente une diminution de 28 % par rapport à la fréquence des déversements signalés en 2018. En plus du rapport de déversement initial soumis dans les 24 heures suivant chaque événement de déversement en 2019, un rapport de suivi détaillé a été soumis dans les trente (30) jours suivant chaque déversement signalé. Baffinland a continué à enquêter sur les causes fondamentales de tous les déversements qui se sont produits sur le site en 2019 afin que des mesures correctives efficaces à long terme puissent être mises en œuvre pour réduire la fréquence des déversements sur les sites du projet.

### Utilisation de l'eau et surveillance de l'eau douce

En vertu de l'autorisation du permis d'eau de type « A », de l'eau douce a été prélevée en 2019 pour soutenir trois (3) activités clés du projet: l'approvisionnement en eau potable (domestique), la suppression de la poussière et d'autres usages industriels. En 2019, les limites de prélèvement d'eau quotidienne, stipulées dans le permis d'eau de type « A », à des fins de suppression de la poussière n'ont pas été dépassées aux sources d'eau approuvées pour le projet, à l'exception de trois (3) sources d'eau de suppression de la poussière le long du chemin de portage pendant les mois d'été. Bien que la limite de prélèvement d'eau quotidienne totale pour le lac Camp (355,4 m<sup>3</sup>/jour) n'ait pas été dépassée en 2019, il y a eu douze (12) incidents où le volume d'eau quotidienne prélevé à des fins domestiques a dépassé la limite de prélèvement d'eau quotidienne du lac Camp (203,8 m<sup>3</sup>/jour). Ces douze (12) incidents, détaillés dans le tableau 4.1, seraient le résultat d'une mauvaise catégorisation des volumes d'eau prélevés à des fins industrielles et d'une erreur de l'opérateur due à des contraintes de capacité en eau brute. Pour éviter que des incidents similaires ne se reproduisent, Baffinland prévoit d'améliorer la documentation et la catégorisation des volumes d'eau prélevés et d'optimiser le suivi pour les opérateurs afin de soutenir les activités du projet. De plus, il y a eu un (1) incident où le volume d'eau quotidien prélevé à des fins industrielles a dépassé la limite de prélèvement d'eau quotidienne du lac du km 32 (67,5 m<sup>3</sup>/jour). L'incident était dû à une plus grande utilisation de l'eau pour la construction de passages sur glace ce jour-là. Aucun autre incident de prélèvement d'eau ou de dépassement pour les utilisations domestiques et industrielles n'a été constaté en 2019.

Tout au long de 2019, Baffinland a continué à mettre en œuvre le programme de réseau de surveillance (PRS) décrit dans l'annexe I du permis d'utilisation de l'eau de type « A », en analysant les effluents (c'est-à-dire les eaux usées traitées, les eaux huileuses traitées) rejetés dans le milieu récepteur et en surveillant la qualité des eaux de surface dans les zones spécifiques du projet (c'est-à-dire le ruissellement des eaux de surface en aval des zones du projet). D'après l'examen des résultats du PRS de 2019 communiqués à l'OEN, à RCAANC et à l'AIQ, les dépassements des critères de rejet applicables en 2019 concernaient principalement le ruissellement des eaux de surface et les effluents présentant des niveaux élevés de

matières en suspension totales (MST). Dans chaque cas, des mesures de contrôle appropriées ont été mises en œuvre pour rétablir les niveaux de MST en dessous des critères de rejet applicables. Baffinland continue d'évaluer et de mettre en œuvre les mesures correctives et d'atténuation appropriées pour répondre aux préoccupations actuelles en matière de sédimentation dans le cadre du projet.

En plus du PRS, une surveillance environnementale continue et des études d'effets, y compris le Plan de surveillance des effets aquatiques (PSEA) du projet, ont été menées en 2019 conformément aux engagements pris dans le PRE, et l'étude d'impact environnemental finale (EIEF) a été approuvée dans le cadre du certificat de projet.

#### Consultations et engagement de la communauté

Tout au long de 2019, Baffinland a continué à consulter les communautés et les organisations du nord de Baffin, concernant les activités de construction sur le site, les opérations et la saison de navigation de 2019, les progrès concernant l'emploi des communautés du nord de Baffin, les activités et les résultats de la surveillance environnementale et les phases futures du projet. Baffinland reste déterminée à s'engager de manière significative avec les parties prenantes potentiellement touchées par le projet, les organismes de réglementation applicables et le grand public.

#### Résumé des plans pour 2020

Le plan de travail 2020 a été préparé et fourni par Baffinland aux parties concernées le 1er novembre 2019, conformément à la section 6.1 du bail commercial et à la partie J, point 3 du permis d'utilisation de l'eau de type « A », aux fins d'un examen annuel de la sécurité des activités entreprises sur une base annuelle.

Le plan de travail 2020 décrit le développement et l'exploitation prévus de la mine, le concassage du minerai et le transport terrestre, le stockage et l'expédition maritime du minerai, ainsi que la poursuite du développement et de la construction des infrastructures nécessaires au port de Milne, au chemin de portage et au site minier.

La proposition d'expansion de la phase 2 du projet continue de passer par le processus d'examen et d'approbation facilité par la CNER et l'OEN. Les programmes de surveillance environnementale du projet prescrits par le certificat de projet, les permis d'utilisation des eaux, les autorisations, les plans de gestion et les plans de surveillance des effets environnementaux se poursuivront tout au long de 2020.

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## ABBREVIATIONS

ABA.....	Acid Base Accounting
AEMP.....	Aquatic Effects Monitoring Plan
ARD.....	Acid Rock Drainage
Baffinland.....	Baffinland Iron Mines Corporation
CCME.....	Canadian Council of Ministers of the Environment
CIRNAC.....	Crown Indigenous Relations and Northern Affairs Canada
Commercial Lease.....	Commercial Lease No. Q13C301
CREMP.....	Core Receiving Environment Monitoring Program
DAF.....	Dissolved Air Flotation
ECCC.....	Environment and Climate Change Canada
EEM.....	Environmental Effects Monitoring
ERP.....	Early Revenue Phase
ERP.....	Emergency Response Plan
FEIS.....	Final Environmental Impact Statement
HWB.....	hazardous wastes and materials
MBR.....	Membrane Bioreactor
MDL.....	Method Detection Limit
MDL.....	Minimum Detection Limit
MDMER.....	Metal and Diamond Mining Effluent Regulations
ML.....	Metal Leaching
NIRB.....	Nunavut Impact Review Board
NAG.....	Non-Potentially Acid Generating
NRP.....	Net Potential Ratio
NWB.....	Nunavut Water Board
OEN.....	Options Exercise Notice
OHS.....	Occupational Health & Safety
OPEP.....	Oil Pollution Emergency Plan
OWTS.....	Oily Water Treatment System
PAG.....	Potentially Acid Generating
PWSP.....	Polishing Waste Stabilization Pond
QA.....	Quality Assurance
QC.....	Quality Control
QE.....	Qikiqtaaluk Environmental
QIA.....	Qikiqtani Inuit Association
SCP.....	Spill Contingency Plan
SNP.....	Surveillance Network Program
STP.....	Sewage Treatment Plants

TCLP.....	Toxicity Characteristic Leaching Procedure
TDGA.....	Transportation of Dangerous Goods Act
TOG.....	Total Oil and Grease
TP.....	Total Phosphorus
TRAN.....	Tote Road Adjustment Notice
TREEP.....	Tote Road Earthworks Execution Plan
TSS.....	Total Suspended Solids
Type 'A' Water Licence.....	Type 'A' Water Licence - 2AM-MRY1325 – Amendment No. 1
Type 'B' Water Licence.....	Type 'B' Water Licence - 2BE-MRY1421
VEC.....	Valued Ecosystems Components
WRF.....	Waste Rock Facility
WSCC.....	Workers' Safety & Compensation Commission
WTP.....	Water Treatment Plant

## 1 INTRODUCTION

### 1.1 PURPOSE AND SCOPE

This report to the Qikiqtani Inuit Association (QIA) and the Nunavut Water Board (NWB) has been prepared to summarize the 2019 Mary River Project (the Project) activities and monitoring conducted under Baffinland Iron Mines Corporation's (Baffinland) Type 'A' Water Licence - 2AM-MRY1325 – Amendment No. 1 (Type 'A' Water Licence), the Commercial Lease No. Q13C301 (Commercial Lease) between the QIA and Baffinland, and Crown Land leases for the Tote Road (N2019Q0011) and Bruce Head (N2019J0010). All annual reporting requirements for the Commercial Lease, except a summary of the exploration and drilling activities conducted in 2019, are included within this report. A separate annual report has been prepared for the QIA and NWB to summarize the 2019 exploration and geotechnical activities conducted within the scope of Baffinland's Type 'B' Water Licence - 2BE-MRY1421 (Type 'B' Water Licence) and Commercial Lease, as well as the Crown Land Use Permit for Steensby Inlet (N2019C0009). Concordance tables referencing where in this report the annual reporting requirements outlined in the Commercial Lease and Type 'A' Water Licence have been met are presented in Appendix A.

The Type 'A' Water Licence includes provisions for sampling programs that involve recording data related to the volume of water extracted for any purpose, testing of effluents (e.g., treated sewage effluents) discharged to the environment, and monitoring water quality within specific Project areas (e.g., surface discharge downstream of Project infrastructure, stormwater from containment structures, etc.). These data are summarized and referenced in the completed NWB Annual Report Forms, included as Appendix B, and are described in greater detail in the subsequent sections.

Figures 1 and 2 present the locations of the key areas associated with the Project where activities in 2019 were undertaken. These areas included Milne Port (Figure 3), the Milne Inlet Tote Road (Tote Road; Figure 4) and the Mary River Mine Site (Mine Site; Figure 5). Accommodations at the Mid-Rail Camp and Steensby Port, as shown in Figures 6 and 7, respectively, remained closed and unoccupied during 2019. The Bruce Head camp, shown in Figure 2, was occupied throughout 2019 in support of the marine monitoring studies conducted in Milne Inlet and along the shipping route.

### 1.2 REGULATORY FRAMEWORK

Although the key regulatory and legal documents that relate to this report are the Commercial Lease and the Type 'A' Water Licence, this report is presented in the context of other applicable regulatory authorizations and schedules for the Project. A list of the key regulatory permits, approvals and authorizations that allowed for the work to be completed at the Project in 2019 is presented in Table 1.0.

## 2 PROJECT ACTIVITIES, MODIFICATIONS AND INFRASTRUCTURE CHANGES

### 2.1 SUMMARY OF 2019 PROJECT ACTIVITIES

The Project activities undertaken in 2019 were conducted at Milne Port, the Mine Site and along the Tote Road. The general Project activities conducted during 2019 included the following:

- The continued development and construction of Project infrastructure required at Milne Port and the Mine Site;
- Mining operations at Deposit No. 1, including the crushing, trucking and shipping of ore to international markets;
- At Milne Port, vessels carrying fuel, equipment and supplies for activities at the Mine Site and Milne Port arrived during the shipping season;
- Material, fuel and supplies required for construction and operational activities were transported from Milne Port to the Mine Site year round via the Tote Road;
- Year-round operation of camp facilities at the Mine Site and Milne Port, and seasonal operation of the Bruce Head camp for marine monitoring programs;
- Operation of the aerodrome at the Mine Site, which supported year round passenger and freight service by aircraft to/from local communities, Iqaluit and southern Canada;
- Operation of helicopter and fixed wing aircraft to service regional exploration and environmental monitoring studies, and other general Project activities;
- Care and maintenance of the inactive Steensby Port camp;
- Continued progressive reclamation of areas of current and past use;
- Completion of environmental studies and monitoring programs identified in the FEIS, FEIS Addendum and Type 'A' Water Licence; and
- Continued engineering and environmental studies to support future phases of the Project (i.e. Phase 2 Expansion).

As described in the 2019 Work Plan, and discussed previously with the NWB, equipment and materials arrived on sealift during the 2019 summer and are currently stored on site in anticipation that they will be used by Baffinland during the construction and operation of the Phase 2 Expansion Project, should an amended Project Certificate be issued by the Nunavut Impact Review Board and an amended Type 'A' Water Licence be issued by the NWB. This approach was necessary in light of the constraints presented by the short Arctic construction and shipping season.

As required by the Commercial Lease and Type 'A' Water Licence, Baffinland submitted to the NWB, QIA and CIRNAC a 2019 Work Plan on October 31, 2018. Table 2.0 reconciles the activities, construction and

infrastructure changes completed in 2019 to the works proposed in 2019 Work Plan. Construction Summary Reports for work completed in 2019 are provided in Appendix C.1, and include the following:

- Mary River Mine Truck Shop (H353004-10000-430-066-0001)
- Mary River Tank Farm (H353004-10000-430-066-0002)
- Saliivik Camp Effluent Line (H353004-10000-430-066-0003)
- Mary River Tank Piping and Electrical (H353004-10000-430-066-0004)
- Saliivik Camp (H353004-10000-430-066-0005)
- Milne Port Tank Farm Addition (H353004-40000-121-066-0002)
- Milne Port Ore Stockpile Pond 1A (H353004-40000-430-066-0001)
- Milne Port Ore Stockpile Expansion (H353004-40000-430-066-0002)
- Milne Port Water Management Structures (H353004-40000-430-066-0004)
- Milne Port 380 Person Camp (H353004-40000-430-066-0005)

## 2.2 MODIFICATIONS

### 2.2.1 Modification Applications Summary

During 2019, Baffinland continued to develop the Project and submitted two (2) modification applications to the NWB, under the Section G of the Type 'A' Water Licence, to upgrade and improve Project infrastructure at Milne Port (Modification No. 11 and Modification No. 12). Throughout 2019, Baffinland received approval from the NWB for the two (2) modification applications submitted by Baffinland during 2019. Table 2.1 summarizes the modification applications submitted to date and their current approvals status.

### 2.2.2 Modifications Implemented

The following subsections outline the construction works completed during 2019 and the current status of the Project's modifications approved by the NWB.

#### 2.2.2.1 Modification No. 3b – Milne Port 380-Person Camp

The 380-person camp at Milne Inlet construction was initiated in 2019 on the existing camp pad, and was completed in September, 2019. Construction activities completed for Modification No. 3b to date included the construction of the camp's pad and preparatory construction works required to support the camp's planned construction in 2019. A Construction Summary Report for relevant facilities regulated under the Type 'A' Water Licence is provided in Appendix C.1.

#### 2.2.2.2 Modification No. 4 – Mine Site 800-Person Camp (Sailiivik Camp)

Initiated in 2017, construction of the new 800-Person Camp (Sailiivik Camp) continued throughout 2019, and was completed on January 28, 2020. A Construction Summary Report for relevant facilities regulated under the Type 'A' Water Licence is provided in Appendix C.1.

#### 2.2.2.3 Modification No. 5 – Mine Site Crusher Facility Pond Expansion

Construction of the Crusher Facility's Pond Expansion was completed in October 2018. A Construction Summary Report for the expansion of the Crusher Facility's footprint and associated surface water management pond will be submitted after additional remedial earthworks are completed to the ditching system.

#### 2.2.2.4 Modification No. 7 – 2018 Work Plan and 2018 Work Plan Addendum

Construction works completed in 2019 under Modification No. 7 included the repair of the WRF pond liner, concurrent with the work to expand the WRF approved under Modification No. 8. Baffinland initiated the construction of berms, ditches and culverts at Milne Port around new laydown infrastructure as outlined in the Project's Milne Port Water Management Plan, and the upgrade to the Milne Port access roads. Construction on the mine haul road widening and cross cut was initiated in 2019, and remains on-going with completion scheduled for 2020. The mine truck shop construction was initiated in 2018, and completed in 2019 with the truck shop going in to service in June 2019, a Construction Summary Report is provided in Appendix C.1

Relocation of the effluent discharge point and marine manifold at Milne Port were deferred in 2019 and will be evaluated in 2020.

#### 2.2.2.5 Modification No. 8 – Mine Site Waste Rock Facility Expansion

Construction activities completed in 2019 under Modification No. 8 included the repair and expansion of the WRF pond, as well as the completion of new perimeter ditching that will encompass the expanded footprint of the WRF pile. Construction of the perimeter ditching and WRF pond works was ongoing at the end of 2019, with minor works left to complete in early 2020.

#### 2.2.2.6 Modification No. 9 – Milne Port Ore Stockpile Facility Expansion

Construction of the expansion of Pond 1 (Pond 1a) was initiated in 2018 and completed in 2019. Baffinland submitted as-built drawings to the NWB on April 1, 2019 confirming the design volume was achieved prior to the earthworks on the pad. Construction of the pad and perimeter ditching was initiated in 2019, and completed on May 1, 2019. Construction Summary Reports for Pond 1a and the Stockpile Expansion are provided in Appendix C.1.

#### 2.2.2.7 Modification No.10 – Mine Site Upgrades

Construction of the treated sewage effluent pipeline for discharging treated sewage effluent from the 800-Person Camp (Sailiivik Camp) to the existing discharge location near Mary River was completed in 2019. A Construction Summary Report is provided in Appendix C.1.



Expansion of the Mine Site Non-Hazardous Waste Landfill Facility (Landfill Facility) was ongoing in 2018 and involved the construction of and deposition of waste at the Landfill Facility's second waste cell (Cell No. 2). The Mine Site Landfill Facility will continue to be developed as outlined in Modification No. 10 to support continued Project operations.

#### 2.2.2.8 Modification No.11 – Installation of an Incineration Unit at Milne Port's 380-Person Camp

Following approval, Baffinland installed one (1) new incinerator to support the 380-Person Camp infrastructure at Milne Port. Prior to operating the unit, the incinerator was subject to stack testing to confirm emissions standards were being met immediately following commissioning of the unit, consistent with Project Certificate Condition No. 12. Baffinland has not commissioned the 380-Person Camp Incineration Unit and will complete stack testing to confirm emissions standards are being met prior to operation. A Construction Summary Report will be completed and submitted following the commissioning of the unit.

#### 2.2.2.9 Modification No.12 – Milne Port Ore Stockpile #1 and Water Management Expansion

The further expansion of Stockpile #1 at Milne Port was initiated in 2019 following approval of the modification request. Note that construction is divided into two (2) stages, where the second stage is dependant on receipt of a fisheries act authorization from DFO. Construction of the first stage will be ongoing in 2020, with the second stage planned to proceed on approval from DFO.

### 2.3 OTHER CONSTRUCTION ACTIVITIES

Other construction activities completed in 2019, not outlined in Sections 2.1 and 2.2, were either carry over items from prior workplans, or focused around the ongoing maintenance and repair of existing Project infrastructure, including roads, laydowns and surface water management infrastructure, such as drainage ditches, culverts and free-span bridges.

Work completed since the previous 2018 Annual Report included extensions/repairs of two (2) culvert crossings at fish bearing sites CV-078 and CV-111. Details of these works are presented in Appendix C.3, 2019 DFO Tote Road Monitoring Report. Table 1 of Appendix C.3 includes details of this work and a photo summary is presented in Appendix B of the report. Future Tote Road improvements/realignments required in support of on-going operations and future expansion projects will continue to follow the historical LOAs, original Hatch 2013 drawings and the TREP. Baffinland will work with DFO as necessary to ensure planned modifications to fish bearing crossings are in compliance of the *Fisheries Act*.

### 2.4 INBOUND AND OUTBOUND SHIPMENTS TO AND FROM THE PROJECT

Equipment, materials, consumables and fuel required for the operation and continued development of the Project were transported to Milne Port via marine shipments between July and October, 2019. In 2019 inbound marine shipments included:

- Fourteen (14) cargo sealifts to Milne Port delivering equipment, materials, and consumables; and

- Five (5) fuel shipments to Milne Port to the Milne Port Bulk Fuel Storage Facility via floating-hose transfer;

Equipment, materials, consumables and fuel received by the Project at Milne Port during 2019 are summarized in Table 2.3 and listed in Appendix E.4. Once at the Project, received equipment, materials, consumables and fuel were either stored at Milne Port or transported to the Mine Site via the Tote Road.

Equipment and materials not required by Project operations, including non-hazardous and hazardous wastes generated by Project activities, were shipped off site from Milne Port via marine shipments between July and October 2019. 2019 outbound marine shipments included:

- Five (5) cargo sealifts to the Ports of Valleyfield, Cote St Catherine and Becancour in Quebec.

Equipment, materials, and wastes shipped off the Project in 2019 are summarized in Table 2.2 and listed in Appendix E.4. All wastes backhauled in 2019 were unloaded at the Port of Valleyfield, Quebec and subsequently transported to licensed, waste disposal facilities in Quebec. No wastes were backhauled to communities in Nunavut for disposal. Details on the wastes backhauled and disposed in 2019, including shipping manifests and the waste disposal facilities utilized, are outlined in Appendix E.1.

### **3 MINING AND EXPLORATION ACTIVITIES**

#### **3.1 EXPLORATION AND GEOTECHNICAL DRILLING ACTIVITIES**

For details on the 2019 exploration and geotechnical activities conducted within the scope of Baffinland's Type 'B' Water Licence and Commercial Lease, please refer to Baffinland's 2019 QIA & NWB Annual Report for Exploration and Geotechnical Activities. Additionally, exploration activities for the Ege Bay Exploration Program are captured in the 2019 QIA & NWB Annual Report for the Ege Bay Exploration.

#### **3.2 MINING ACTIVITIES**

During 2019, mining operations at Deposit No. 1 continued to advance and produced a total of 5.7 million tonnes (Mt) of ore. Total ore produced increased compared to the 5.6 Mt of ore produced in 2018. Ore produced by mining operations at the Mine Site was transported by ore haul trucks along the Tote Road and stockpiled at Milne Port for marine shipment to international market during the open-water shipping season.

Monthly and annual quantities of ore generated by the Project during 2019 are provided in Table 3.0.

#### **3.3 SHIPPING ACTIVITIES**

During the 2019 shipping season, a total of 5.86 Mt of ore was shipped from the Project's Milne Port to international markets. This required a total of eighty-two (82) individual ore carrier voyages. Following the shipping season, ore continued to be stockpiled at Milne Port for subsequent shipment to markets in 2019.

Monthly and annual quantities of ore shipped to international markets from the Project's Milne Port during 2019 are provided in Table 3.1.

#### **3.4 SPECIFIED SUBSTANCES EXTRACTED FROM QUARRIES AND BORROW SOURCES**

During 2019, Baffinland operated several quarries and borrow sources to support Project road maintenance and infrastructure construction. Quarries and borrow sources in operation during 2019 included the Q1 Quarry at Milne Port, the QMR2 Quarry at the Mine Site and the Km 97 Borrow Source near the Mine Site. As per the requirements of the Commercial Lease (Part 6.4, item d) iv) and Type 'A' Water Licence (Schedule B, Item (g), x), Tables 3.2 and 3.3 provide quantities of each specified substance removed by quarter, calendar year and annual reporting period (September 1 – August 31), broken down by individual quarry and borrow source.

## 4 WATER USE

During 2019, water was withdrawn from approved sources and used at Milne Port, the Mine Site and along the Tote Road for Project activities under the authorization of the Type 'A' Licence. Water volumes used to support 2019 exploration and geotechnical drilling activities was withdrawn under the authorization of the Type 'B' Water Licence and has been provided to the NWB and QIA in a separate annual report titled 2019 QIA and NWB Annual Report for Exploration and Geotechnical Activities.

Under the authorization of the Type 'A' Water Licence, freshwater was withdrawn and used by the Project during 2019 to sustain three (3) key activities: potable water supply for camp use, dust suppression and other industrial purposes. The following subsections describe water use at the Project during 2019.

### 4.1 VOLUMES OF FRESHWATER USED FOR DOMESTIC AND INDUSTRIAL PURPOSES

Camp Lake (MS-MRY-1) was used to supply the Mine Site with freshwater for domestic and industrial purposes. Water was withdrawn from Camp Lake using a wet well jetty structure positioned 30 metres from shore. Potable water (domestic) was transported from the jetty to water storage tanks located at the Mine Site's Potable Water Treatment Systems (Mine Site Exploration Camp, Mine Site Complex, Sailiivik Camp) using heat traced water pipelines and/or water trucks. Water required for industrial purposes at the Mine Site was withdrawn and transported from the Camp Lake jetty using water trucks or other equipment (i.e. fire trucks).

Km 32 Lake (MP-MRY-3) was used to supply Milne Port with freshwater for domestic and industrial purposes. Water withdrawn and transported from Km 32 Lake to Milne Port using water trucks. Potable water (domestic) was pumped from water trucks into water storage tanks located at Milne Port's Potable Water Treatment Systems (Port Site Complex, Milne Port Weatherhaven, Milne Port 380p Camp).

Water volumes withdrawn from approved water sources were monitored and documented using flow meters and/or flow extrapolation in accordance with the Type 'A' Water Licence (Part I, Item 9). Total volumes of water withdrawn and used for domestic and industrial purposes were monitored for compliance with the maximum daily withdrawal limits stipulated by the Type 'A' Water Licence (Part E, Item 4; Table 3).

Approved water source locations used for Project sites in 2019 are detailed in Table 4.0 and presented in Figures 3, 4 and 5. Tables 4.0 and 4.1 present the daily, monthly, and annual volumes of freshwater withdrawn from approved water sources on Inuit-Owned Lands (IOL) during 2019. As Steensby Port and Mid-Rail camps were not operated in 2019, water was not withdrawn and/or used at these Project sites in 2019.

Under Table 3 of the Type 'A' Water Licence, source specific water withdrawal limits are specified for both domestic and industrial purposes for each approved water source. Although the total daily water withdrawal limit for Camp Lake (355.4 m<sup>3</sup>/day) was not exceeded in 2019, there were twelve (12) incidents where the daily water volume withdrawn for domestic purposes exceeded Camp Lake's domestic daily water withdrawal limit (203.8 m<sup>3</sup>/day). These twelve (12) incidents, detailed in Table 4.1, are believed to

be a result of the mis-categorization of water volumes withdrawn for industrial purposes and operator error due to raw water capacity constraints. To prevent similar incidents from re-occurring, Baffinland plans to improve the documentation and categorization of water volumes withdrawn to support Project activities. In addition, there was one (1) incident where the daily water volume withdrawn for industrial purposes exceeded the Km 32 Lake daily water withdrawal limit (67.5 m<sup>3</sup>/day). The incident was the result of higher water use for temporary ice crossing construction on that day. No other water withdrawal incidents or exceedances for domestic and industrial water uses were noted in 2019.

#### 4.2 VOLUMES OF FRESHWATER USED FOR DUST SUPPRESSION

Water was withdrawn from the approved water sources along the Tote Road, outlined in Table 2-3 of the Type 'A' Water Licence, using water trucks and applied to Project roads for dust suppression purposes. Daily, monthly and annual water volumes withdrawn from these approved water sources during 2019 for dust suppression purposes are outlined in Tables 4.0 and 4.2.

As identified in Table 4.2, during June, July, August and September several exceedances of source specific daily water withdrawal limits, outlined in Table 2-3 of the Type 'A' Water Licence, occurred at three (3) approved dust suppression water sources along the Tote Road (BG50, CV217 and CV233). All exceedances were based on the source specific daily water withdrawal limits, with annual withdrawal volumes being within the source specific withdrawal water limits stipulated in the Type 'A' Water Licence. Baffinland will continue to work on improving the enforcement of the source specific daily water withdrawal limits at approved water sources along the Tote Road.

#### 4.3 VOLUMES OF RECLAIMED AND RECYCLED WATER

Under the Type 'A' Water Licence (Part E, Item 5), freshwater was reclaimed and recycled throughout the Project and applied to roads for dust suppression purposes. Water quality monitoring for water recycled at Km 97 is provided in Table 7.1.31 (TR-BP-01). A summary of reclaimed and recycled water used during 2019 is provided in Table 4.2.

## 5 WASTE MANAGEMENT

### 5.1 WASTEWATER MANAGEMENT

Under the Type 'A' Water Licence, the Project generated domestic sewage, retained stormwater and runoff at containment areas and ore and waste rock management facilities, and discharged compliant effluents, treated and untreated, to receiving environments at Milne Port and the Mine Site during 2019.

Steensby Port and the Mid-Rail camp remained closed in 2019 and as a result no wastewater was generated and/or discharged at these Project sites. Domestic sewage from the Bruce Head camp was transported to the Milne Port Sewage Treatment Plant for treatment and discharge.

Wastewater and effluents generated in 2019 were managed in accordance with the Project's Fresh Water Supply, Sewage and Wastewater Management Plan (BAF-PH1-830-P16-0010).

#### 5.1.1 Quantities of Sewage Effluent and Sludge from STPs and PWSPs

Throughout 2019, residual sewage sludge (sludge) and treated sewage effluents were generated at the Project's Sewage Treatment Plants (STPs), equipped with Membrane Bioreactor (MBR) technology. Sewage wastes generated by the Project in 2019 were treated and managed using the following facilities:

- Mine Site STP No. 1 (MS-01);
- Mine Site STP No. 2 (MS-01B);
- Mine Site Polishing Waste Stabilization Ponds (PWSPs; MS-MRY-04A, B, C);
- Milne Port STP (MP-01);
- Milne Port STP (MP-01B); and,
- Milne Port PWSP (MP-01A).

At the Mine Site, treated sewage effluent that met the applicable water quality discharge criteria stipulated in the Type 'A' Water Licence was either direct discharged via a dedicated pipeline (MS-01 & MS-01B) or transported by vacuum truck to the approved discharge location located near the Mary River. The commissioned pipeline that allows for direct discharge from Mine Site STP No. 2 (MS-01B), servicing the 800-Person Camp (Sailiivik Camp), to the approved discharge point near Mary River, was completed in 2019.

At Milne Port, compliant treated sewage effluent from the Milne Port STP was either direct discharged via a dedicated pipeline or transported by vacuum truck to the approved discharge point near Milne Inlet. The second STP at Milne Port (Milne Port STP No. 2) was constructed and commissioned in 2019 to service the planned 380-Person Camp.

As part of routine operation of the Project's STPs, dewatered sludge (cake) generated at the STPs was removed daily and transported to site incinerators for disposal. Cake that could not be incinerated onsite

during 2019 was shipped off site during the Milne Port backhaul sealift and disposed at a licensed waste disposal facility in Southern Canada.

During 2019, PWSPs at the Mine Site and Milne Port were utilized to store treated sewage effluent that did not meet the discharge criteria stipulated in the Type 'A' Water Licence. During upset conditions, when untreated sewage was required to be removed from accommodation lift stations and/or Project STPs (during maintenance), sewage, inclusive of non-compliant effluent, and sludge were transported and discharged to PWSPs for temporary storage. In cases where the wastewater stored in the PWSPs required to be discharged, the wastewater was analysed, treated (if required) and discharged to the receiving environment, in accordance with the Type 'A' Water Licence, Part F, Items 17 & 18. During 2019, approximately 632 m<sup>3</sup> of treated wastewater was discharged from the Milne Port PWSP to the approved discharge point near Milne Inlet. Wastewater stored in the Mine Site PWSPs was not discharged to Sheardown Lake NW in 2019.

Daily, monthly and annual quantities of sewage effluent discharged from Project STPs and PWSPs to approved discharge locations are provided in Table 5.0. Table 5.0 also presents the quantities of sewage and sludge diverted to the PWSPs from accommodation facilities as well as the quantities of cake removed from Project STPs and incinerated.

Figures 3 and 5 show the locations of the Milne Port and Mine Site STPs, PWSPs and approved discharge points.

#### 5.1.2 Quantities of Effluent from Containment Areas

During 2019, stormwater retained within containment areas associated with the Project's bulk fuel storage facilities and hazardous materials storage berms (HWB) was analysed in accordance with the Type 'A' Water Licence (Part F, Item 9), treated if required using the mobile Oily Water Treatment System (OWTS), and discharged to the receiving environment. Stormwater analysed and demonstrated to be compliant with the applicable water quality discharge criteria stipulated in the Type 'A' Water Licence was directly discharged to the receiving environment using pumps and non-rigid hose.

At the Milne Port, the OWTS was operated intermittently from August to early September at the Bulk Fuel Storage Facility Stormwater (MP-03) and the Contaminated Snow Containment Facility (MP-04), referred to as MP-04A. During 2019, the mobile OWTS was not used to treat and discharge stormwater from Mine Site containment areas. During 2019, a total of approximately 1,736 m<sup>3</sup> of stormwater was discharged from Project containment areas. Table 5.1 provides the daily, monthly and annual volumes of effluent discharged from Project containment areas at the Mine Site and Milne Port during 2019.

Figures 3 and 5 show the locations of the Milne Port and Mine Site containment areas associated with the Bulk Fuel Storage Facility (stormwater) and Contaminated Snow Containment Facility (MP-04A), respectively.

### 5.1.3 Quantities of Effluent from Surface Water Management Ponds

To manage and monitor stormwater retained by ore and waste rock management facilities, the following four (4) surface water management ponds have been established at the Project:

#### Mine Site

- Crusher Facility Pond (CF Pond; MS-06)
- Waste Rock Facility Pond (WRF Pond; MS-08)

#### Milne Port

- Ore Stockpile - East Pond (MP-05)
- Ore Stockpile - West Pond (MP-06)

Stormwater retained by Project ore and waste rock management facilities at Milne Port and the Mine Site are directed to surface water management ponds by a network of berms and ditches established around the perimeter of each facility.

At the Mine Site, a total of approximately 117,731 m<sup>3</sup> was actively discharged from the WRF Pond (MS-08) to an approved final discharge point within the catchment of Mary River Tributary F (Figure 5) using pumps and non-rigid hose in 2019. A total of approximately 1,413 m<sup>3</sup> was actively discharged from the CF Pond (MS-06) in 2019. Effluent from MS-06 was discharged using a pump and a direct-discharge pipeline to the approved final discharge point near the Mary River.

At Milne Port, approximately 6,465 m<sup>3</sup> (3,235 m<sup>3</sup> at MP-05 and 3,230 m<sup>3</sup> at MP-06) of effluent was actively discharged from the Milne Port Ore Stockpile Ponds to Milne Inlet during 2019. Effluent from MP-05 and MP-06 was discharged to Milne Inlet using pumps and non-rigid hose.

Table 5.2 provides the daily, monthly and annual quantities of effluent discharged from Project surface water management ponds during 2019. Inline flow meters and pumping rate extrapolation were used to monitor volumes discharged to the receiving environment.

Figures 3 and 5 show the locations of the surface water management ponds located at Milne Port and the Mine Site, respectively.

## 5.2 SOLID AND HAZARDOUS WASTE MANAGEMENT

During 2019, Project operations generated various waste types, including domestic, hazardous, and non-hazardous wastes. Waste types were managed as outlined in the Project's Waste Management Plan (BAF-PH1-830-P16-0028) and Hazardous Materials and Hazardous Waste Management Plan (BAF-PH1-830-P16-0011), utilizing the following facilities at the Mine Site and Milne Port.

#### Mine Site

- Waste Management Building (includes incinerator);



- Hazardous waste and materials containment berms (includes MS-HWB-1 to MS-HWB-7) and polishing waste stabilization ponds (PWSP-MS-MRY-4A,B,C);
- Non-Hazardous Waste Landfill Facility; and,
- Open Burning Facility (near Km 98).

#### Milne Port

- Waste Management Building (includes incinerator);
- Hazardous waste and materials containment berms (includes MP-HWB-1 to MP-HWB-4) and polishing waste stabilization pond (PWSP-MP-01A);
- Milne Port Landfarm Facility (includes contaminated snow containment berm); and,
- Open Burning Facility (near Km 2)

Locations of the Project waste management facilities listed above are detailed in Table 5.3 and presented in Figures 3 and 5. Steensby Port and the Mid-Rail Camp remained closed in 2019 and as a result no wastes were generated and/or managed at these Project sites.

The following subsections describe the waste management and disposal activities conducted at the Project during 2019.

#### 5.2.1 Site Incinerators

In 2019, Mine Site and Milne Port incinerators were operated throughout the year to incinerate solid waste as per regulatory guidelines, including the Canadian-wide Standards (CWS), and the Project's Waste Management Plan (BAF-PH1-830-P16-0028). Refer to Section 9.4 for information pertaining to 2019 monitoring activities completed for incinerator bottom ash generated at the Project.

#### 5.2.2 Open Burning

Open burning was conducted throughout 2019 as a method to dispose of untreated wood, cardboard, and paper products generated on site as per Baffinland's Open Burning of Untreated Wood, Cardboard and Paper Products Procedure (BAF-PH1-300-PRO-0001). Open-burning disposal reduces the volume of inert waste directed to Project incinerators and the Mine Site Non-Hazardous Landfill Facility (Landfill Facility). Baffinland's open-burning authorization prohibits the burning of hazardous wastes, non-combustible materials, food waste, plastics, Styrofoam and/or treated wood products (i.e. plywood). To ensure removal of prohibited waste, secondary waste segregation was completed during the loading process at Project open burn facilities. Bottom ash generated from open burn activities is suitable to be deposited at the Project's Landfill Facility.

Open burning locations at Milne Port and the Mine Site are shown in Figures 3 and 5, respectively.

### 5.2.3 Mine Site Landfill Facility

In 2019, inert, non-combustible wastes (plastics, cement, used construction materials, scrap metal, pipes, glass, etc.) generated by Project activities were deposited at the Landfill Facility located at the Mine Site. Non-hazardous waste, including ash from Project incinerators and open-burning activities, and waste that could not be salvaged or incinerated, was also deposited at the Landfill Facility. Disposal of domestic (food) waste, hazardous and biomedical materials at the Landfill Facility is prohibited. Visual inspections were completed throughout 2019 to ensure operational compliance to the Project's Waste Management Plan (BAF-PH1-830-P16-0028).

A total of approximately 16,098 m<sup>3</sup> of waste was deposited at the Landfill Facility in 2019. Table 5.4 provides the monthly and annual quantities of waste deposited at the Landfill Facility during 2019. Since the commissioning of the Landfill Facility, a total volume of approximately 61,298 m<sup>3</sup> of non-hazardous waste has been deposited at the Landfill Facility.

### 5.2.4 Milne Port Landfarm Facility

The Milne Port Landfarm Facility (Landfarm Facility) consists of two geomembrane lined containment cells. The larger west cell is used as a landfarm for the stockpiling and biotreatment of soils contaminated by hydrocarbons from spills. The smaller east cell is used to contain hydrocarbon contaminated snow generated during winter operations. The east cell is also used as a repository for other sources of oily water at Milne Port and provides a practical location where oily water can be effectively treated at Milne Port using the OWTS.

During 2019, the OWTS was used to treat water at the Landfarm Facility. Prior to discharge, water retained in the Landfarm Facility (MP-04A) was sampled to ensure compliance with the applicable discharge criteria stipulated in the Type 'A' Water Licence. Upon determining that the water met the applicable discharge criteria, water was discharged to the tundra adjacent to the Landfarm Facility. Refer to Section 5.1.2 and Table 5.1 for volumes of water discharged from the Landfarm Facility in 2019.

Throughout 2019, hydrocarbon contaminated soils generated from spills continued to be placed and managed during summer months for remediation through natural microbiological and evaporative processes, where possible. Baffinland continued to clean up and remove intermingled debris from soils stored at the Landfarm Facility in 2019. Table 5.5 provides the estimated monthly and annual quantities of soil and contaminated water deposited at the Milne Port Landfarm Facility during 2019.

### 5.2.5 Hazardous Waste Storage and 2019 Backhaul Sealift

During 2019, there were two (2) sealift backhaul events for Project waste. The backhaul sealift vessels departed Milne Port in August and September 2019 carrying non-hazardous and hazardous waste materials generated and stored on site by the Project since the previous sealift backhaul in 2018. Prior to the 2019 backhaul, non-hazardous and hazardous waste materials were collected, packaged, and manifested at Milne Port under the direction of Qikiqtaaluk Environmental (QE). The shipments of waste materials off the Project and transport to licenced waste receiving facilities in Southern Canada was

conducted under the direction of QE. Appendix E.1 provides additional information pertaining to Baffinland's 2019 waste backhaul program, including inventories and shipping manifests identifying materials shipped off the Project in 2019 for disposal, treatment and/or recycling in Southern Canada. No Project wastes were transported and deposited in communities located in Nunavut during 2019.

Hazardous waste materials backhauled off the Project in 2019 that are regulated by the Transportation of Dangerous Goods Act (TDGA) included (in alphabetical order):

- Sodium Nitrite – UN 1500
- Waste aerosol cans - UN 1950
- Waste batteries – UN 2794
- Waste fuel - UN 1202, 1203

Non-hazardous and hazardous waste materials backhauled off the Project in 2019 that were not regulated by the TDGA included (in alphabetical order):

- Calcium chloride
- Contaminated oily solids
- Contaminated water (sewage, oily water)
- Domestic waste (including STP cake)
- Electrical waste (E-Waste)
- Hazardous ash
- Kitchen grease
- Used tires
- Waste glycol
- Waste oil and grease
- Scrap metal
- Decommissioned equipment and/or parts

Hazardous waste and waste material generated after the 2019 backhaul sealift continues to be sorted and stored in designated waste storage areas at the Project. Wastes that cannot be treated, recycled or disposed at the Project will be packaged and prepared for the next backhaul sealift in 2020.

### 5.3 WASTE ROCK MANAGEMENT

#### 5.3.1 Mine Site Waste Rock Facility

Mining operations at Deposit No. 1 (Nuluujaak Pit) continued throughout 2019. A total of approximately 4.3 Mt of waste rock was generated during 2019. The waste rock generated at Deposit No. 1 was analytically tested based on operational testing protocols outlined in the Project's Phase 1 - Waste Rock Management Plan (BAF-PH1-830-P16-0029). Based on the analytical testing results, waste rock was classified as Potentially Acid Generating (PAG) or Non-Acid Generating (NAG) material. The 2019 results for the geochemical operational testing program are discussed in Section 9.6 and provided in Appendix E.6. All PAG waste rock generated from mining operations in 2019 was deposited at the WRF. Table 5.6 presents the monthly and annual quantities of waste rock generated, deposited at the WRF and used for construction purposes.

## 6 REPORTED INCIDENTS

### 6.1 SPILLS

During 2019, twenty-five (25) spills were reported to the Northwest Territories-Nunavut (NT-NU) Spill Line, CIRNAC and QIA by the Project. Overall, this represented a frequency decrease of 28% when compared to the frequency of reportable spills in 2018. Table 6.0 provides a basic summary of the spills reported in 2019.

In addition to the original spill report submitted within 24 hours of each spill event in 2019, a detailed follow-up report was submitted within thirty (30) days of each reported spill. The follow-up reports included a description of the event, the immediate cause(s), corrective and preventative action(s), photos, and a map showing the location of the spill.

To further outline the corrective actions taken in 2019 and planned in future years to address the sediment releases reported during freshet 2019, Baffinland provided the 2019 Freshet Monitoring Report to the NWB, CIRNAC, ECCC and the QIA in early 2020. A copy of the 2019 Freshet Monitoring Report is provided as Appendix E.11.

All spills reported to the NT-NU Spill Line in 2019 are summarized in Table 6.1 and presented in Figure 8. The follow-up spill reports and original spill reports are provided in Appendix E.8.4. It should be noted that four (4) of the reported spills occurred in secondary containment and did not result in hazardous materials (waste oil, diesel) being released to the receiving environment. Spills that did not result in a release to the receiving environment are identified in Table 6.1.

A basic analysis of the spills reported in 2019 indicated that the most common causes for the spills were equipment failure (component malfunction, preventive maintenance), improper operation of equipment, and procedural issues (inadequate procedure or training). Baffinland continues to work to identify basic causes so that effective long term corrective actions can be implemented. Mandatory spill reporting enforced at all levels in the organization; improved preventive maintenance plans, daily pre-operational checks of all equipment, spill tray usage bulletins, tool box meetings, prescribed training sessions, specific product handling and spill reduction plans are all examples of initiatives undertaken by Baffinland to reduce the frequency spills at the Project.

To ensure Baffinland's emergency response teams have the skills needed to safely and effectively respond to marine spills, marine spill response training was provided by external consultants at Milne Inlet, prior to the 2019 fuel resupply. During the training, the Project's Emergency Response Plan (ERP; BAF-PH1-840-P16-0002), Spill Contingency Plan (SCP; BAF-PH1-830-P16-0036) and Milne Inlet Oil Pollution Emergency Plan (OPEP; BAF-PH1-830-P16-0013) were reviewed. During the practical deployment exercises, the responders were provided with the opportunity to learn and then practice skills by responding to marine spill scenarios using the Milne Port resident spill response equipment. The findings related to the annual training sessions continue to be used to inform revisions to the OPEP, ERP and SCP.

## 6.2 HEALTH & SAFETY INCIDENTS

Under the Mine Health and Safety Act, several health and safety incidents were reported by the Project during 2019. Details of the incidents are presented in Table 6.2. All incidents were reported to the Worker's Safety and Compensation Commission as required by the Mine Health and Safety Act. Moving forward, to ensure compliance with the requirements of the Commercial Lease, Baffinland will ensure reportable health & safety incidents, as defined in Section 5.2, a), vii of the Commercial Lease, are reported to the QIA in a timely manner following their occurrence in accordance with the Lease Operations Guide.

## 7 MONITORING

The following subsections discuss and summarize the results of the monitoring program outlined in Schedule I of the Type 'A' Water Licence, known as the Surveillance Network Program (SNP), as well as other relevant aquatic effects monitoring programs conducted at the Project in 2019.

It should be noted that several monitoring stations listed in Schedule I of the Type 'A' Water Licence were originally established during the Exploration Phase of the Project and have since become inactive as a result of continued development and infrastructure changes at the Project. An application to the NWB to discontinue and/or relocate these inactive monitoring stations, including MP-MRY-4, MP-MRY-4A, MP-MRY-7, MP-MRY-12, MS-MRY-09, MS-MRY-10 and MS-MRY-11, was provided in the 2018 Annual Report. These changes were accepted by NWB on September 10, 2019. Appendix E.13 includes an application of proposed 2020 changes to the SNP stations.

### 7.1 SEWAGE DISPOSAL

Sewage generated and managed by the Project in 2019 was managed as described in the Project's Fresh Water Supply, Sewage and Wastewater Management Plan (BAF-PH1-830-P16-0010) and in accordance with the Type A' Water Licence (Part F, Items 17 - 19).

During 2019, sewage generated from Project sites was directed to the Project STPs located at Milne Port (MP-01, MP-01B) and the Mine Site (MS-01, MS-01B). Treated sewage effluent was discharged to Mary River (freshwater) and Milne Inlet (ocean) in accordance with the applicable effluent discharge criteria outlined in the Type 'A' Water Licence. Figures 3 and 5 show the locations of the Milne Port and Mine Site STPs, PWSPs and approved discharge points.

In 2019, there was two (2) exceedances of the effluent discharge criteria for treated sewage effluent generated by Project operations which were reported in the respective monthly water licence SNP reports. On May 1, 2019, a treated sewage effluent sample from the Mine Site STP (MS-01B) servicing the Sailiivik Camp exceeded the applicable discharge criteria for total ammonia of 4 mg/L. The elevated ammonia concentration (9.45 mg/L) is believed to be the result of sampling error. The subsequent sampling event of the treated sewage effluent confirmed that total ammonia had returned to concentrations below the applicable discharge criteria. On November 12, 2019, a treated sewage effluent sample from the Mine Site STP (MS-01B) also exceeded the applicable discharge criteria for total ammonia (mg/L). The elevated ammonia concentration (47.0 mg/L) is believed to have been caused by temporary upset conditions at the Mine Site STP. The subsequent sampling event of the treated sewage effluent confirmed that total ammonia had returned to concentrations below the applicable discharge criteria. No other water quality exceedances involving treated sewage effluent at the Project were observed in 2019.

Table 5.0 provides the daily, monthly and annual quantities of treated sewage effluent discharged to the receiving environment in 2019. Table 7.1 provides the water quality monitoring results for treated sewage effluents discharged from Project STPs (MS-01, MS-01B and MP-01, MP01B) to the receiving environment during 2019.

### 7.1.1 2019 Mine Site PWSP Effluent Discharge to Sheardown Lake NW

No wastewater was discharged from the Mine Site PWSPs to Sheardown Lake NW in 2019.

### 7.1.2 2019 Milne Port PWSP Effluent Discharge to Milne Inlet

In accordance with the PWSP Effluent Discharge Plan, provided in the Project's Fresh Water Supply, Sewage and Wastewater Management Plan (BAF-PH1-830-P16-0010), wastewater stored at the Milne Port PWSP (MP-01A) was discharged to Milne Inlet in August 2019.

From August 8 to August 22, 2019, a Dissolved Air Flotation (DAF) water treatment system, consistent with the system described in the PWSP Effluent Discharge Plan, was used to treat and discharge effluent from the Milne Port PWSP (MP-01A) to Milne Inlet. During the discharge, a total of approximately 632 m<sup>3</sup> of compliant effluent was discharged to Milne Inlet. During the discharge, in field monitoring was conducted to ensure effluent discharged to Milne Inlet remained in compliance with applicable discharge criteria.

Table 5.0 provides the daily and monthly quantities of effluent discharged from the Milne Port PWSP in 2019. Table 7.1 presents the water quality results for the 2019 discharge. There were no indicated exceedances of the applicable water quality discharge criteria during the 2019 discharge from external laboratory results or in field monitoring.

As outlined in the Project's Fresh Water Supply, Sewage and Wastewater Management Plan (BAF-PH1-830-P16-0010), in the event of a water quality monitoring exceedance during a discharge, the discharge would be stopped immediately and would not be continued until compliance with the applicable discharge criteria could be demonstrated by additional water quality monitoring.

## 7.2 STORMWATER FROM CONTAINMENT AREAS

During 2019, stormwater retained within containment areas associated with the Project's bulk fuel storage facilities, hazardous materials storage berms (HWB) and Milne Port Landfarm Facility (MP-04) was analysed in accordance with the Type 'A' Water Licence (Part F, Item 9), treated if required using the mobile Oily Water Treatment System (OWTS), and discharged to the receiving environment. Stormwater analysed and demonstrated to be compliant with the applicable water quality discharge criteria stipulated in the Type 'A' Water Licence was directly discharged to the receiving environment using pumps and non-rigid hose from the Bulk Fuel Storage Facility (MP-03). In 2019, there was no other direct discharge of stormwater from these facilities to the receiving environment; all other stormwater was transferred to the Contaminated Snow Containment Berm (MP-04A) and treated with the mobile OWTS.

For stormwater requiring treatment, the mobile OWTS, coupled with polishing trains of metal removal media, was in all cases effective at removing the organic constituents of 'oil and grease' and reducing monitored metals to concentrations within the acceptable range for discharge, stipulated by the Type 'A' Water Licence, with the exception of one (1) lead exceedance during the discharge of treated effluent from the Contaminated Snow Containment Berm (MP-04A), which is part of Milne Port Landfarm Facility (MP-04).



On September 8, 2019, a treated effluent sample collected from the mobile OWTS, while stationed at the Contaminated Snow Containment Berm, had an elevated total lead concentration of 0.00117 mg/L; exceeding the applicable discharge criteria for total lead of 0.001 mg/L. Discharge of treated effluent from the mobile OWTS was halted on September 11, 2019, prior to receipt of the elevated total lead result from the analytical lab, and was not resumed in 2019. Due to the close proximity to freeze-up at the Project, subsequent sampling was not undertaken following receipt of the elevated total lead result. Potential causes of the exceedance include lab error, due to the close proximity of the discharge criterion to the analytical minimum detection limit (MDL), and the metals removal media used by the mobile OWTS being spent. No other water quality exceedances involving discharges from Project containment areas were observed in 2019.

During discharges from containment areas in 2019, periodic sampling and analyses by an independent accredited laboratory (ALS) were conducted for applicable parameters to ensure compliance. To monitor the performance of the OWTS in the field and ensure the removal of organics constituents from the influent, sampling and analyses were also conducted in the field on a daily basis utilizing a portable total oil and grease (TOG) analyser.

Water quality results for the 2019 discharges are presented in Table 7.1. Refer to Section 5.12 and Table 5.1 for the volumes of effluent discharged from Project containment areas during 2019.

### 7.3 SURFACE WATER RUNOFF AND SEEPAGE

In accordance with the terms of the Type 'A' Water Licence (Part I), surface run-off/seepage from facilities designed to contain, withhold, divert and retain water or wastes were monitored during periods of flow and after significant precipitation events. The monitoring locations and associated facilities at Milne Port and the Mine Site are presented in Figures 3 and 5, respectively, and in Table 7.0.

In accordance with the terms of the Type 'A' Water Licence, Schedule I, active monitoring stations were monitored during periods of flow for the required parameters to protect receiving waters from the identified potential contaminants. A summary of the monitoring stations and 2019 monitoring results is provided in the subsections below. Monitoring of surface water at select crossings along the Tote Road in accordance with the Project's Tote Road Monitoring Program (TRMP) was also conducted during 2019 and is summarized in subsection 7.3.6 below.

#### 7.3.1 Milne Port Ore Stockpile Facility

Monitoring stations MP-05 and MP-06 under Schedule I of the Type 'A' Water Licence represent the east and west surface water management ponds, respectively, that collect surface water runoff from the stockpile pad associated with the Milne Port Ore Stockpile Facility (refer to Figure 3). Surface water runoff from the pad is directed to the ponds by a network of ditches along the pad's perimeter.

During 2019, retained stormwater within both ponds (MP-05 and MP-06) was actively discharged to Milne Inlet using pumps and sections of non-rigid hose. During discharges, water quality monitoring of the effluent discharged was conducted to ensure compliance with the applicable discharge criteria outlined

in the Type 'A' Water Licence. No exceedances of the applicable discharge criteria were observed during the discharges from both ponds (MP-05 and MP-06) in 2019.

Volumes of effluent discharged from the east (MP-05) and west (MP-06) ponds in 2019 are presented in Table 5.2. Water quality monitoring results for the 2019 discharges are provided in Table 7.1.

### 7.3.2 Mine Site Landfill Facility

Monitoring stations MS-MRY-13A and MS-MRY-13B under Schedule I of the Type 'A' Water Licence represent the surface runoff sample locations downstream of the Landfill Facility at the Mine Site (refer to Figure 5). In 2019, surface water runoff from the Landfill Facility was initially sampled in May and continued to be sampled until freeze-up in October.

During 2019, there were no exceedances of the applicable water quality criteria involving surface water runoff downstream of the Landfill Facility. Water quality monitoring results for MS-MRY-13A and MS-MRY-13B are presented in Table 7.1.

Surface flow volumes continued to be monitored at MS-MRY-13A in 2019 using an existing weir and a pressure transducer logger installed in late June 2019. Daily surface flows at MS-MRY-13A during 2019 are presented in Appendix E.3.

To further confirm program feasibility and utility, Baffinland continued the groundwater monitoring program at the Landfill Facility in 2019. During September 2019, Baffinland installed shallow groundwater wells up-gradient and down-gradient of the Landfill Facility using drive point piezometers. Groundwater wells were established to the depth of permafrost (approx. 1.1 – 1.8 metres) and water samples were collected at well locations where groundwater was detected. For a complete discussion of the 2019 groundwater monitoring program at the Landfill Facility, refer to Section 7.5 and Appendix E.12 of this report.

### 7.3.3 Mine Site Waste Rock Facility

Monitoring station MS-08 under Schedule I of the Type 'A' Water Licence represents the surface water management pond (WRF Pond) that collects surface water runoff from the WRF's footprint. Surface water runoff from the WRF's footprint is directed to the WRF Pond by a network of ditches along the WRF's perimeter.

To address the concerns observed at the WRF in 2017, Baffinland installed, commissioned and operated a dedicated water treatment plant (WTP) at the WRF to treat surface water runoff retained by the WRF Pond. The WRF WTP was approved under Water Licence Modification No. 7 and uses a combination of coagulation, pH adjustment, precipitation, flocculation and filtration to ensure effluent discharged from the WRF Pond meets the applicable water quality effluent criteria stipulated by the Type 'A' Water Licence and Metal & Diamond Mining Effluent Regulations (MDMER). A full description of the WRF WTP treatment processes is provided in the Project's updated Fresh Water Supply, Sewage and Wastewater Management Plan (BAF-PH1-830-P16-0010).

During 2019, Baffinland completed remediation of the existing WRF Pond liner to mitigate seepage identified from the WRF Pond in 2017. The remediation work included the removal of the existing liner and subsequent repair of the pond subgrade. Installation of the replacement liner was carried out from September 2019 through January 2020. The WRF Pond was also expanded in 2019, increasing the WRF Pond capacity from 9,000 m<sup>3</sup> to a maximum operating capacity of approximately 52,000 m<sup>3</sup>, which corresponds to the proposed expanded WRF pile catchment area of 585,000 m<sup>2</sup>.

During 2019, operation of the WRF WTP continued to prove to be effective at addressing the water quality concerns observed at the WRF in 2017. Beginning in June 2019, controlled discharges of treated effluent from the WRF Pond were conducted and resulted in no exceedances of the water license water quality discharge criteria in 2019 observed in samples collected under Schedule I of the Type 'A' Water Licence. Additional effluent discharge sampling was completed to satisfy the requirements of the MDMER. Within those sampling events, there was one (1) exceedance of the MDMER maximum authorized monthly mean concentration for TSS of 15 mg/L and one (1) non-compliant discharge event of the MDMER grab sample criterion for TSS of 30 mg/L in 2019. The results of sampling completed to satisfy MDMER requirements are detailed in Baffinland's 2019 MDMER Annual Report (Baffinland, 2020c).

Controlled effluent discharges from the WRF in 2019 involved pumping retained surface water runoff from the WRF Pond through the WRF WTP and releasing the treated effluent at an established final discharge point located within the catchment of Mary River Tributary F.

During periods of effluent discharge, the water quality of effluent was monitored at various stages of the WRF WTP by dedicated water treatment operators to ensure the plant was operating as designed and that treatment processes were achieving the target effluent quality. As outlined in the Project's Fresh Water Supply, Sewage and Wastewater Management Plan (BAF-PH1-830-P16-0010), in the event that water quality monitoring indicated that effluent no longer met the applicable water quality discharge criteria, discharge of effluent was halted and recirculated back to the WRF Pond until it could be demonstrated by additional water quality monitoring that effluent was compliant with the applicable water quality discharge criteria.

Volumes and water quality results associated with the 2019 controlled effluent discharges from the WRF are provided in Tables 5.2 and 7.1, respectively. Locations of the WRF effluent monitoring and discharge points are shown in Figure 5 and provided in Table 7.0.

#### 7.3.4 Mine Site Crusher Facility

Monitoring station MS-06 under Schedule I of the Type 'A' Water Licence represents the surface water management pond (CF Pond) that collects surface water runoff from the Mine Site Crusher Facility's (Crusher Facility) footprint. Surface water runoff from the Crusher Facility's footprint is directed to the CF Pond by a network of ditches that run along the Crusher Facility's perimeter.

In August, 2019, 50 kg of lime powder was added to the CF Pond at a slurry concentration of 8.256 grams per liter to increase the pH to compliant levels. Following addition of the lime, pumps were used to

circulate the water in the CF Pond. Monitoring was conducted throughout the treatment process to confirm compliant pH. Periodic controlled discharges of the treated effluent from the CF Pond occurred during August and September 2019. Controlled effluent discharges from the Crusher Facility in 2019 involved pumping retained surface water runoff from the CF Pond through a direct-discharge pipeline shared with the Mine Site STPs and releasing the effluent at an approved discharge point near the Mary River (Figure 5). During periods of discharge, water quality monitoring was conducted to ensure compliance with the applicable water quality discharge criteria outlined in the MDMER and the Type 'A' Water Licence. No exceedances of the applicable water quality discharge criteria were observed during the 2019 Crusher Facility effluent discharges.

Volumes and water quality results associated with the 2019 controlled effluent discharges from the Crusher Facility are provided in Tables 5.2 and 7.1, respectively. Locations of the Crusher Facility effluent monitoring and discharge points are shown in Figure 5 and provided in Table 7.0.

On July 10, 2019, water was discovered flowing out of the east collection ditch at the toe, resulting in a release of non-compliant run-off. The source of the water was determined to be ice and water entrained in the ore stockpile, which melted as the stockpile was reclaimed. During this period, the site was experiencing dry and warm conditions which compounded melting. Upon discovering the release, water was immediately diverted to prevent entry into the east collection ditch, and pumped directly from the source into the CF Pond (MS-06). In situ field measurements at the release location demonstrated neutral pH (ranging from 6.94 to 7.32 pH units), indicating the pH of the runoff was within the pH criterion (6.0 to 9.5 pH units). Laboratory analytical results indicated elevated TSS, however sampling error may have contributed to elevated levels due to the low level of flow observed.

Subsequent downstream water quality monitoring also demonstrated compliance for all parameters with applicable regulatory criteria. The release was reported by Baffinland to relevant regulators and is documented in NT-NU Spill Report 19-279.

Water was subsequently discovered flowing out of the east collection ditch at the toe on August 31, 2019. In this instance, pooled water on the crusher pad was being disturbed from increased equipment/vehicle traffic through the area, which was present due to the initiation of remedial earthworks in response to the non-compliant run-off event on July 10. On discovering the release, water was immediately diverted to prevent entry into the east collection ditch, and pumped directly from the source into MS-06. Equipment traffic was also eliminated from the area. In situ field measurements at the release location demonstrated that the pH of the non-compliant runoff, measured at 5.85 pH units, was below the pH criterion range of 6.0 to 9.5 pH units stipulated by the MDMER.

Subsequent downstream water quality monitoring demonstrated compliance for all parameters with applicable regulatory criteria, and was determined to be not acutely lethal. The release was reported by Baffinland to relevant regulators and is documented in the NT-NU Spill Report 19-279 Update 1.

Copies of the original and follow-up spill reports for the release are provided in Appendix E.8.4 and provide additional details on the release and the corrective actions taken by Baffinland.

### 7.3.5 Deposit No. 1

Monitoring stations MS-MRY-9, MS-MRY-10, MS-MRY-11 and MP-MRY-12 under Schedule I of the Type 'A' Water Licence represent surface flow/seepage monitoring locations associated with the 2008 Bulk Sample Program's Deposit No. 1 Pit and associated ore stockpiling/processing locations at the Mine Site and Milne Port. As a result of continued developed and infrastructure changes at the Project, these monitoring stations have become inactive. The 2018 Annual Report included an application to the NWB to discontinue and/or relocate these monitoring stations to reflect current Project infrastructure. On September 10, 2019, the NWB accepted the proposed changes, issuing the relocations of stations MS-MRY-9, MS-MRY-10 and removal of stations MS-MRY-11 and MP-MRY-12 in Table 13 Monitoring Program: Milne Port Site and Table 14 Monitoring Program: Mary River Mine Site within Schedule I.

### 7.3.6 Tote Road Monitoring Program

During 2019, monitoring was conducted along the Tote Road to monitor the quality of surface water flows at select water crossings (culverts, bridges) in accordance with the Tote Road Monitoring Program (TRMP). Water crossings monitored under the TRMP were selected to provide a geographically representative sample set of water crossings for each watershed intersected by the Tote Road (Phillips Creek, Ravn River, Mary River), as well as proximity to snow dump locations and locations of historical sedimentation events. During 2019, upstream and downstream water quality was monitored for pH, Total Suspended Solids (TSS), Total Dissolved Solids (TDS) and turbidity at thirty-one (31) locations along the Tote Road.

The objective of the program is to identify potential project-related impacts to surface water as a result of operation and maintenance of the Tote Road throughout freshet and the remainder of the flowing water season, by comparing upstream concentrations to downstream concentrations at defined distances and sampling intervals. In screening the data to determine if the project infrastructure has resulted in a change to the surface water quality, a potential Project related change is defined as a greater than 50 mg/L increase in TSS concentrations in the downstream sample when concentrations are less than 250 mg/L. Based on the sampling completed in 2019 under the TRMP and the above screening criteria, there were no Project related impacts to surface water at water crossings along the Tote Road. There were three (3) events where TSS samples downstream of the Tote Road were greater than the Type 'A' Water Licence grab sample criteria of 30 mg/L, however for each of these events the upstream concentration also exceeded the grab sample criteria of 30 mg/L, suggesting elevated TSS was the result of natural sedimentation.

The TRMP is included as Appendix D of the Project's Roads Management Plan (BAF-PH1-830-P16-0023). Water quality results for the 2019 TRMP monitoring are presented in Table 7.5.

### 7.3.7 Snow Stockpile Monitoring

In accordance with Section 5.2 of the Snow Management Plan surface runoff water from snow stockpiles was monitored at active snow stockpile locations on the Project in 2019. In addition to the monitoring via the SNP and TRMP site, eight temporary monitoring locations were monitored during freshet. Samples

were taken at each active location weekly during periods of flow. There were four (4) events where TSS samples downstream of snow stockpiles were greater than the Type 'A' Water Licence grab sample criteria of 30 mg/L outlined in Part F Item 26. However, following each of these events TSS levels returned to below the applicable water quality criteria prescribed by the Type 'A' Water Licence by the next monitoring event. Sampling error due to low flow conditions is suspected to have been involved in two (2) of these events, resulting in artificial entrainment of sediment. There was also two (2) instances in which the monthly average TSS concentration was greater than the maximum average concentration of 15 mg/L stipulated in the Type 'A' Water Licence. Water quality results for the 2019 snow stockpile monitoring are presented in Table 7.1

#### 7.4 SURFACE WATER RUNOFF DOWNSTREAM OF PROJECT AREAS AND QUARRIES

In accordance to the terms of Type 'A' Water Licence (Part I, Item 25), surface runoff and/or discharge was monitored at stations established downstream of construction and operation areas at Milne Port and the Mine Site. Similar to 2018, managing surface water drainage at the Project during freshet remained a challenge and resulted in several sedimentation events and incidents where surface water flows downstream of Project areas exceeded the applicable discharge criterion for TSS. However, prompt implementation of sedimentation mitigation measures, outlined in the Project's Surface Water and Aquatic Ecosystem Management Plan (BAF-PH1-830-P16-0026), proved effective in controlling the mobilization of sediments and returning TSS levels to below the applicable TSS criterion stipulated by the Type 'A' Water Licence at these locations.

Active surface water monitoring stations outlined in Schedule I of the Type 'A' Water Licence and located downstream of Project construction and operation areas are presented in Figures 3 and 5, as well as in Table 7.0. In accordance with the terms of the Type 'A' Water Licence (Part I, Item 27), the water quality monitoring results for these locations are provided in Table 7.1 and are compared to the applicable water quality criteria prescribed by the Type 'A' Water Licence. Daily surface flow volumes were also measured at or near most of these surface water monitoring locations and are detailed in Appendix E.3.

In accordance to the terms of the Type 'A' Water Licence (Part I, Item 23), runoff and/or discharge water quality monitoring from borrow sources and quarries was conducted during 2019. During 2019, there were four (4) incidents where water samples collected downstream of quarry locations exceeded the applicable grab sample criterion for TSS. All four (4) exceedances occurred during freshet; three (3) exceedances occurred on May 15, May 27 and June 2, 2019 at MQ-C-B downstream of the QMR2 Quarry, and one (1) exceedance occurred on May 20, 2019 at MQ-C-D downstream of the QMR2 Quarry. The average TSS at MQ-C-D in May (25.9 mg/L) exceeded the applicable maximum average TSS concentration discharge limit of 15 mg/L. All five (5) exceedances are believed to be a result of high flows and rapid snow melt during freshet and demonstrated to be short-lived events with subsequent sampling events showing that TSS levels had returned to acceptable concentrations. 2019 water quality monitoring results for surface water runoff from developed quarries are provided in Table 7.1 and are compared to the applicable water quality discharge criteria. Monitoring locations downstream of developed quarries are presented in Figures 3 and 5, and in Table 7.0.

In accordance to the terms of Type 'A' Water Licence (Part I, Item 23), acute toxicity testing was also performed at surface runoff and/or discharge locations downstream of active quarries Q1 at Milne Port and QMR2 at the Mine Site during 2019. 2019 acute toxicity results for surface runoff downstream of active quarries are presented in Table 7.1 of this report. During 2019, all acute toxicity samples collected downstream of active quarries (Q1 and QMR2) were demonstrated to be non-acutely toxic.

To address the 2019 sedimentation events and on-going sedimentation concerns at the Project, Baffinland continued to implement corrective and mitigation measures, including initiatives outlined in the Sedimentation Mitigation Action Plan (Golder, 2016a), Dust Mitigation Action Plan (Golder, 2016b) and Tote Road Earthworks Execution Plan (TREP; Golder, 2017). Corrective actions and mitigation measures implemented to address sedimentation concerns at the Project in 2019 are fully discussed in the 2019 Freshet Monitoring Report provided in Appendix E.11. The reader is referred to the Project's Surface Water and Aquatic Ecosystem Management Plan (BAF-PH1-830-P16-0026) for the best management practices and mitigation measures implemented at the Project to manage and mitigate the impacts of sedimentation and erosion on receiving waterbodies, aquatic ecosystems, fish and fish habitat.

#### 7.5 2019 GROUNDWATER MONITORING PROGRAM

Baffinland continued to conduct groundwater monitoring at the Mine Site Landfill Facility in 2019. The 2019 monitoring program used a similar methodology to the 2018 Groundwater Monitoring Program, and the 2017 Groundwater Pilot Program, establishing shallow groundwater wells up-gradient and down-gradient of the Landfill Facility using drive-point piezometers and collecting water samples near the depth of the active layer (approximately 1.1 to 1.8 metres) during 2019. The 2019 monitoring program involved sampling two (2) groundwater wells up-gradient of the Landfill Facility and three (3) groundwater wells down-gradient of the Landfill Facility.

Water quality results for groundwater samples collected during the 2019 program did not demonstrate any significant trends that would allow for evaluation of potential water quality changes associated with the Landfill Facility. Due to the limited water quality data set, further groundwater monitoring and assessment of the stratigraphy is required to gain a better understanding of natural groundwater chemistry and hydrogeology at the Project site. As additional monitoring is conducted in future years, Baffinland will be able to better characterize natural groundwater chemistry at the Project and identify any trends, including potential impacts from Project activities or infrastructure. For additional details on the 2019 groundwater monitoring program conducted at the Landfill Facility, refer to Appendix E.12 of this report.

Baffinland plans to continue the groundwater monitoring program in 2020, and plans to implement an expansion to the program to gain a better understanding of natural groundwater chemistry at the Project site. Due to challenges associated with sampling methodologies for groundwater data collection in a permafrost environment and the challenges in interpreting this data, however, long-term trends will likely not be identified even with an expanded dataset. Despite these operational challenges, Baffinland is committed to retaining groundwater consultants that are specialized in Arctic environments, to further

assess the current program and provide recommendations in 2020. Following 2020, Baffinland will provide further recommendations to the NWB and other relevant parties.

## 7.6 QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC)

Water quality samples collected in 2019 as required by Schedule I of the Type 'A' Water Licence are presented in Table 7.1. Samples collected for analysis in 2019 followed the general recommendations presented in the Quality Assurance (QA) and Quality Control (QC) Guidelines for use by Class A Licensees in Meeting SNP Requirements and for Submission of a QA/QC Plan (CIRNAC, 1996).

Field QA/QC procedures adopted by the Project are described in detail in the Project's Surface Water Sampling Program - Quality Assurance and Quality Control Plan (QA/QC Plan; BAF-PH1-830-P16-0001). Field QA/QC samples include the collection of field duplicates and the use of field and travel blanks. Of the 465 discrete sets of Type 'A' Water Licence regulatory samples collected in 2019, field QA/QC samples (56 duplicates, 9 field blanks and 13 travel blanks) comprised 16.8 % of the total samples collected. This satisfied the minimum 10% QA/QC sampling requirement stipulated in the QA/QC Plan. Baffinland will continue to adhere to the water sampling protocols outlined in the QA/QC Plan, including the 10% QA/QC sampling requirement, to ensure the collection of representative water quality data at the Project.

The results and interpretation of the QA/QC program are presented in Table 7.2. The results for the field QA/QC program are mostly acceptable, however, there was some variation observed in field duplicates that had relative percent differences (RPD) greater than 30%. A summary of these duplicates is presented in Table 7.3.

In addition, a total of twenty-four (24) parameters in the field and travel blanks with result values greater than their respective parameter method detection limits (MDL) were identified in 2019, however all were within three (3) times the value of their respective MDLs, with the exception of; ammonia in duplicate MP-0102 on July 1<sup>st</sup>, turbidity in duplicate MS-0103 on September 4<sup>th</sup>, turbidity in duplicate MQ-C-A03 on August 11<sup>th</sup> and total dissolved solids in duplicate MQ-C-D03 on September 2<sup>nd</sup>. Poor quality distilled water and/or laboratory analytical error is a likely explanation for these elevated parameter values.

To ensure the continued collection of representative, accurate and reliable water quality data at the Project, Baffinland will continue to require all personnel involved with water quality sampling to be experienced and fully trained in the Project's QA/QC procedures and processes outlined in the Project's QA/QC Plan.

Laboratory analyses of water samples were carried out by three (3) accredited analytical laboratories during 2019. A laboratory operated by ALS Environmental located in Waterloo, ON and run by ALS Canada Ltd. (ALS) performed the majority of sample analyses in 2019. An on-site accredited field laboratory, located at the Mine Site and also operated by ALS, performed select analyses in 2019 (i.e. pH, TSS, TDS, turbidity), reducing logistical costs while providing timely results. Acute and chronic toxicity testing was conducted by Aquatox Testing & Consulting Inc. (Aquatox), located in Guelph, ON, subcontracted by ALS.



ALS adheres to a designated QA/QC Management System which includes documentation and document control, staff training and internal audits. The practices exceed accreditation requirements for high confidence in data reliability utilising:

- Calibration verification standards and drift control standards;
- Surrogate standards and internal standards;
- Replicate analyses and blanks on submitted samples;
- Standard reference materials (SRM's) and matrix spikes; and,
- Standards Data Quality objectives, established for each QC sample, based on a combination of reference method objectives, customer requirements and historical test method performance.

The laboratory QA/QC data is reported in individual analytical certificates.

### 7.7 AQUATIC EFFECTS MONITORING PLAN (AEMP)

The Aquatic Effects Monitoring Plan (AEMP) describes how monitoring of the aquatic environment will be undertaken at the Project. The AEMP was identified as a follow-up monitoring program in Baffinland's Final Environmental Impact Statement (FEIS; Baffinland, 2012) and is prescribed by the Type 'A' Water Licence. The AEMP, specifically, is a monitoring program designed to:

- Detect the short-term and long-term effects of the Project's activities on the surrounding aquatic environment;
- Evaluate the accuracy of impact predictions;
- Assess the effectiveness of planned mitigation measures; and
- Identify additional mitigation measures to avert or reduce unforeseen environmental effects.

The AEMP focuses on the key potential impacts to freshwater environment valued ecosystems components (VECs), as identified in the Final Environmental Impact Statement and Addendum for the Early Revenue Phase (ERP). The freshwater VECs include water quantity, sediment quality, and freshwater biota and fish habitat. The AEMP has been structured to serve as an overarching 'umbrella' that conceptually provides an opportunity to integrate results of individually monitored but related aquatic monitoring programs.

The following are the component studies that comprise the AEMP. The 2019 study reports are provided in Appendix E.9:

- Core Receiving Environment Monitoring Program (CREMP), provides a basis for the evaluation of any mine-related influences on water quality, sediment quality and/or biota (including phytoplankton, benthic invertebrates and/or fish) within aquatic environments located near the Mine Site. The 2019 study report is provided as Appendix E.9.1.

- Lake Sedimentation Monitoring Program evaluates baseline and Project-influenced lake sedimentation rates at Sheardown Lake NW. The 2019 study report is provided as Appendix E.9.2.
- Hydrometric Monitoring Program assesses flow in several streams and rivers near Project sites and supports the AEMP. The 2019 study report is provided in Appendix E.9.3.
- Dustfall Monitoring Program evaluates dustfall rates in proximity to the Tote Road, Milne Port and Mine Site. The 2019 study forms part of the 2019 Terrestrial Environment Annual Monitoring Report, available on Baffinland's Document Portal.
- Stream Diversion Barrier Study was an initial study evaluating the potential for fish barriers under natural conditions and due to Project-related stream diversions. This study has been deferred due to the low impact anticipated by the reduced footprint of the WRF during the Early Revenue Phase of the Project.
- Environmental Effects Monitoring (EEM) Program, as required under the MDMER. The first biological EEM study for the Project, Phase 1, was conducted in August 2017 and submitted to ECCC during January 2018. The next biological EEM study for the Project, Phase 2, is planned for August 2020.

The 2019 AEMP study reports outlined above and provided in Appendix E.9 include the evaluation of Project related influences on chemical and biological conditions at mine-exposed waterbodies following the fourth full year of mine operations.

On November 8 and 9, 2017, Baffinland chaired the 2017 Freshwater Workshop in Iqaluit, NU with regulators and stakeholders (ECCC, CIRNAC, GN, NWB, QIA) to discuss the Project's freshwater monitoring programs and the proposed changes to the Project's Core Receiving Environment Monitoring (CREMP), included in Revision 2 of the AEMP; submitted to regulators in April 2016. Taking into account discussions and feedback received at the 2017 Freshwater Workshop, Baffinland resubmitted a modified Revision 2 of the AEMP in May 2019 to regulators and stakeholders through the Phase 2 Proposal water licence amendment, for review and approval.

## 7.8 NATURAL SEDIMENTATION EVENTS

During 2019, multiple natural sedimentation events were observed and documented in various locations across Baffin Island including but not limited to undisturbed tributary north of Milne Port, upstream Mary River and an upstream tote road water crossing. All observed natural sedimentation events occurred during the summer months of June 2019 to August 2019, analytical results for TSS are presented in Table 7.4.

On June 12, 2019, while commuting back from Brucehead, employees observed turbid water in an undisturbed tributary twelve (12) kilometers (km) north of Milne Port. Crews returned to the area the following day, June 13, 2019, and collected upstream and downstream samples called MP-NS-19-01-US and MP-NS-10-01-DS from the braided stream. The samples resulted in elevated total suspended solids (TSS) concentrations of 102 mg/L and 96.8 mg/L, respectively. An area downstream from the MP-NS-19-01

sample site, approximately 8 km north of Milne Port, was also sampled. These samples with the following names, MP-NS-02-US and MP-NS-02-DS, had TSS concentrations of 71.6 mg/L upstream, and 37.6 mg/L downstream. Following both sampling events, a flight was conducted upstream to determine the source. An area was discovered where a slope was slumping glacial till into the tributary.

On June 17th, 2019 the Exploration department documented a natural sedimentation events, during routine flights back from Ege Bay. The event was found occurring on the Isortoq River, approximately 175 km south east of mine site. The river was noticed to be quite turbid and samples were taken named ISORTOQ-NS-01-US and ISORTOQ-NS-01-DS. TSS concentrations from these samples were 617 mg/L and 370 mg/L.

While employees were conducting field work via helicopter on July 24, 2019, it was observed that Mary River was running turbid and creating a large plume when entering Mary Lake. The crew proceeded to sample at two sample locations downstream of the project site on Mary River, named MRY-SED-DS (downstream sample) and MRY-SED-US (upstream sample). MRY-SED-DS had a TSS concentration of 18 mg/L. MRY-SED-US resulted in a TSS concentration of 8 mg/L. As the downstream sample was greater than the upstream (closest to the Mary River Project), it was observed that sedimentation was naturally increasing with distance from the Project site and unrelated to the operation of the Mary River Mine Site.

On August 14, 2019, Mary River was observed to be fairly turbid. Crews investigated further upstream, north of the project, and the turbidity remained consistent. Samples were taken in three (3) locations of Mary River, upstream approximately 6 km of Mine Site, G0-03, 3 km east of Mine Site, E0-20, and adjacent to Mine Site, E0-20. A fourth sample taken was from Mary River tributary, approximately 6 Km north east of Mine Site called MRTF-1. TSS concentrations from all four (4) samples displayed slightly elevated total suspended solids, but still below TSS criteria stipulated in the Type 'A' Water Licence (monthly average – 15 mg/L; grab – 30 mg/L). On August 16, 2019, an investigative flight was taken upstream Mary River in hopes to determine a source of the turbidity. Approximately 14 km north east of Mine Site, significant slope slumping was observed as the likely source of the elevated sediment, downstream of a melting ice deposit.

On August 15, 2019, a water sample collected upstream of Km 17 bridge, on Phillips Creek, was analyzed and determined to have a TSS concentration of 58.7 mg/L.

All of these sedimentation events demonstrated elevated TSS concentrations in drainages upstream or unaffected by Project activities that significantly exceeded the TSS criteria stipulated in the Type 'A' Water Licence (monthly average – 15 mg/L; grab – 30 mg/L). Given the naturally elevated TSS levels observed within the Project area over the last 4 years of mine operation, Baffinland will pursue submitting an application to the NWB in 2020 to modify the TSS criteria and/or assessment framework (i.e. static criteria vs. criteria adjusted for background) used by the Type 'A' Water Licence to assess Project effects on TSS concentrations.

## 8 RECLAMATION, CLOSURE AND FINANCIAL SECURITY

### 8.1 PROGRESSIVE AND FINAL RECLAMATION

Throughout 2019, the following progressive reclamation activities were completed:

- Continued development and implementation of a long term multi-year plan to address localized areas of permafrost degradation associated with the current borrow areas, including the borrow areas near Km 97. Borrowing in the Km 97 areas has led to thawing of the underlying permafrost soils, which has caused a considerable increase in ponded water, and as a result there is settlement from thaw of both the ground ice in the soil matrix and the thaw of ice wedges. To address the permafrost degradation, a reclamation plan for the historical Km 97 borrow areas was developed by Baffinland and is outlined in Appendix B of the Borrow Source Management Plan – Km 97 (BAF-PH1-830-P16-0032). During 2019, Baffinland continued the reclamation efforts by executing significant dewatering of the KM97 borrow areas to reduce permafrost degradation. Works outlined in the reclamation plan are expected to continue in 2020.
- Evaluation of the condition of the Tote Road by Tetra Tech led to the implementation of an action plan to address the historic borrow sources on the Tote Road, to be executed in 2019 and 2020. Works were initiated at the KM7.2 borrow with the placement of material to restore the grade of the borrow pit. Further work is required to restore the overburden material, as well as other infilling and stabilization activities at the remaining priority historic roadside borrow source locations.
- Demobilization and backhaul of equipment and supplies not required for near term activities, including the current inventory of hazardous waste and other materials by means of sealifts from Milne Port.
- Initiation of reclamation works on historical sections of the Tote Road, specifically the Km 77 area. Reclamation works involved the removal of the historical road base material to restore natural drainage.
- On-going management of hydrocarbon impacted soils at the Milne Port Landfarm Facility generated from historical decommissioning efforts and ongoing operations.

A summary of the reclamation works listed above and their implications on financial security held by both the QIA and the Crown (CIRNAC) for the Project are presented in Table 8.0.

### 8.2 CURRENT RESTORATION LIABILITY

During 2019, a total of \$30,857,887 CAD of additional security was posted with the QIA, and \$150,246 of additional security with CIRNAC for activities outlined in the 2019 Work Plan (Rev. 1). Closure and reclamation security posted for Project activities as of December 31, 2019 is summarized in Table 8.1.

## 9 PLANS, REPORTS AND STUDIES

### 9.1 SUMMARY OF STUDIES REQUESTED BY THE NUNAVUT WATER BOARD

In 2019, studies were not requested by the NWB.

### 9.2 REVISIONS TO PLANS REPORTS AND MANUALS

Management and monitoring plans that have been updated since the submission of 2018 QIA & NWB Annual Report for Operations can be accessed on Baffinland's Document Portal, located on the Baffinland corporate website.

### 9.3 SUMMARY OF FUEL STORAGE

During 2019, bulk fuel storage and dispensing facilities located at the Mine Site and Milne Port were used to support Project activities, including diesel electric power generation and building heat, light and heavy vehicle and equipment operation, fixed-wing aircraft and helicopter flights, and shiploader operations.

At the end of 2019, the Milne Port Bulk Fuel Storage Facility included:

- three (3) 12 ML Arctic Diesel field-fabricated tanks;
- one (1) 13 ML Arctic Diesel field-fabricated tank;
- two (2) 5 ML Arctic Diesel field-fabricated tanks;
- one (1) 3 ML Arctic Diesel field-fabricated tank; and
- four (4) 0.75 ML Jet-A1 pre-fabricated tanks.

All tanks are vertical single wall steel construction and designed to API 650 specifications. Fuel inventories at the Milne Port Bulk Fuel Storage Facility on December 31, 2019 consisted of 41.33 ML and 2.32 ML of Arctic Diesel and Jet-A1, respectively. No significant modifications to the fuel management infrastructure at Milne Port were completed in 2019.

At the end of 2019, the bulk fuel storage and dispensing facilities at the Mine Site included the Mine Site Bulk Fuel Storage Facility, equipped with one (1) 15 ML Arctic Diesel field-fabricated tank, four (4) 0.5 ML Arctic Diesel pre-fabricated tanks, and two (2) 50,000 L Jet-A1 steel tanks at the Mine Site Aerodrome. Both bulk fuel facilities are equipped with lined secondary containment berms, engineered to comply with the CCME "Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products" (2015). As of December 31, 2019, fuel inventories at the Mine Site consisted of 13.27 ML of Arctic Diesel at the Mine Site Bulk Fuel Storage Facility and 62,387 L of Jet-A1 at the Mine Site Aerodrome.

During late April to early August, the 15 ML Arctic Diesel field fabricated tank was constructed and installed with a lined secondary containment berm, engineered to comply with the CCME "Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products" (2015). A Construction Summary Report detailing the construction of the 15 ML Arctic Diesel fuel tank is attached in Appendix C.1.

During 2019, the Milne Port Bulk Fuel Storage Facility was resupplied by fuel tanker vessels during the open-water shipping season via ship-to-shore floating hose fuel transfers. Throughout the year, fuel at the Mine Site Bulk Fuel Storage Facility and Mine Site Aerodrome were resupplied by bulk fuel tanker trucks transporting fuel from Milne Port via the Tote Road. The remaining fuel requirements needed for the various aspects of the Project during 2019 were supplied using day tanks and 205 L drums.

As described in the 2019 QIA and NWB Annual Report for Exploration and Geotechnical Activities, drummed fuel was used mainly to support on site helicopters involved with exploration and environmental field studies in 2019. As of December 31, 2019, there were 1,004 drums (205 L) of fuel (624 Arctic Diesel and 380 Jet-A1) stored at Steensby Port, 775 drums (205 L) of fuel (427 Jet-A1 and 348 gasoline) at the Mine Site and 60 drums (205 L) of fuel (16 Jet-A1 and 44 gasoline) at Milne Port. No fuel was stored at the Mid-Rail or Bruce Head camps in 2019.

It is Baffinland's practice to construct and operate its fuel storage/dispensing facilities in accordance with applicable guidelines and regulations such as the CCME "Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products" (2015), Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (Canadian Environmental Protection Act, 1999 SOR/2008-197 June 12, 2008) and the National Fire Code of Canada. To protect receiving waters, it is Baffinland's practice to store drummed fuel, petroleum based wastes, and other potentially hazardous products within lined containment areas whenever possible. Engineered lined containment areas are in place at the Mine Site, Milne Port, Steensby Port and Mid-Rail camp for the storage of drummed fuel and hazardous products and wastes.

Part D, Item 18 in the Type 'A' Water Licence requires that Baffinland shall ensure the proper function of earthworks associated with facilities at the Mine Site and Milne Port such as the bulk fuel storage and ancillary fuel facilities. Bi-annual geotechnical inspections are required to be performed by a geotechnical engineer registered in Nunavut. To fulfil the requirement, geotechnical inspections of Project sites were conducted in June/July and September 2019. Reports for the geotechnical inspections were submitted to the NWB within 60 days of each inspection. Copies of the 2019 geotechnical inspection reports are provided in Appendix C.2.

#### 9.4 RESULTS OF CHEMICAL ANALYSIS OF INCINERATOR BOTTOM ASH

To confirm that Project incinerators at the Mine Site and Milne Port were operating as designed (per manufacturer's specifications), routine process monitoring was completed throughout 2019. This included monitoring the temperature in the primary chamber, secondary chamber and stack, as well as burn times, system pressure and fuel level.

Prior to disposal at the Mine Site Landfill Facility, residual bottom ash generated from the site incinerators was tested using Toxicity Characteristic Leaching Procedure (TCLP) analysis. TCLP testing of residual bottom ash was conducted to ensure compliance with the Type 'A' Water Licence (Part F, Item 7) and confirm that disposal of residual bottom ash at the Landfill Facility would not generate leachate at concentrations above the applicable water quality criteria. In comparing the TCLP analytical results for the

2019 composite ash samples with the applicable environmental guidelines, all ash samples were below the threshold values for monitored parameters. As such, all ash generated during 2019 by Project incinerators was disposed at the Landfill Facility. Appendix E.2 provides the analytical certificates for ash generated and sampled during 2019 as well as summary tables detailing the disposal method for ash generated by Project incinerators in 2019.

Baffinland will continue to conduct routine sampling of residual bottom ash generated by Project incinerators as described above to ensure ash disposed in the Landfill Facility is compliant with the established applicable environmental guidelines. Ash identified by TCLP analysis to exceed the established threshold values will be segregated, packaged and shipped offsite to Southern Canada for proper disposal at a licensed waste facility.

#### 9.5 SUMMARY OF GEOCHEMICAL ANALYSIS FOR OPERATED QUARRIES

In accordance with terms of the Type 'A' Water Licence (Schedule B, Item g (xiii)), geochemical analysis results for aggregates extracted from approved quarries during 2019 to support construction and road maintenance activities are presented in Appendix E.7. Appendix E.7 also provides a statistical summary of the 2019 geochemical results for each quarry, in addition to the laboratory analytical data.

During 2019, an operational sampling program continued to be executed, with the intent to confirm the original predictions that the aggregate material removed from the approved quarries would have a low potential for Acid Rock Drainage and Metal Leaching (ARD/ML). Samples analyzed were collected from blast hole cuttings. When assessing whether aggregate is Potentially Acid Generating (PAG), the general cut-off criteria used by the Project is a sulphur concentration greater than 0.20%. Material that had a sulphur concentration less than 0.20% was considered Non-Potentially Acid Generating (NAG) material.

2019 results for aggregates extracted from the Q1 Quarry (Appendix E.7) continued to indicate a predominantly low potential for ARD/ML as was originally predicted in the assessments made prior to development and documented in the Project's Q1 Quarry Management Plan (BAF-PH1-830-P16-0017). However, one (1) sample from the eastern extent of Q1 yielded abnormally anomalous sulphur at 0.33%. This sample was a localized occurrence surrounded by very low sulphur results and did not meet the criteria to be delineated as PAG when considering the volumes being mined. Baffinland collected greater than 1 in 10,000 BCM samples in 2020, greater than the frequency outlined in the Quarry Management Plan, and as result the average of this anomalous sample with the corresponding samples in the same blast result in the material block being classified as NAG. Baffinland will further investigate the presence of PAG within Quarry Q1 and will evaluate the sampling frequency in 2020 to determine if additional sampling within each blast are required to delineate the presence of PAG.

In 2019, results for aggregate extracted from the QMR2 Quarry showed a slight increase in average sulphur concentration (0.07%) when compared to pre-development predictions (0.01%) outlined in the Project's QMR2 Quarry Management Plan (BAF-PH1-830-P16-0040). A total of seven (7) samples had measured sulphur concentration above the 0.2% threshold. These results were localized anomalous samples adjacent to low sulphur results and did not meet the criteria to be delineated as PAG when

considering the volumes being mined. To properly manage aggregates produced in these localized areas where PAG was identified in QMR2 in prior years, the procedure implemented in 2019 required the Mine Operation's on-site geologists to review and evaluate the geochemical results of the blasthole cuttings and delineate the limits of the PAG material for each blast pattern prior to each blast. Additional sampling was completed in 2019 to ensure sufficient resolution of sulphur data within each blast. Material blocks were determined based on a minimum separable size of 2,000 BCM with average sulphur of less than 0.2% within each 10,000 BCM. Delineated blast patterns were then communicated to the blasts teams for execution. While no PAG blocks were delineated in 2019, any blocks identified as PAG will be deposited in the Waste Rock Facility, consistent with the Quarry Management Plan.

## 9.6 WASTE ROCK STUDIES AND OPERATIONAL TESTING RESULTS

During 2019, Baffinland continued to characterize Deposit No. 1 waste rock generated by Project operations and optimize waste rock deposition and management strategies to address outstanding concerns identified at the WRF during 2017 and 2018. Waste rock monitoring and management activities completed in 2019 included:

- QA/QC sampling on the WRF;
- Operational geochemical testing of waste rock generated by mining operations at Deposit No. 1;
- Continual monitoring of the eight (8) installed thermistor series at varying depths and locations throughout the WRF to characterize the thermal conditions of the Facility; and,
- Continued optimization of the Project's near-term waste rock deposition and management strategies, and the newly amended Phase 1 Waste Rock Management Plan – BAF-PH1-830-P16-0029 which is introducing the application of new methods for analysing for waste materials

QA/QC sampling was conducted at the WRF in 2019 in accordance to *Phase 1 Waste Rock Management Plan - BAF-PH1-830-P16-0029*. This sampling was to verify that NAG & PAG material placement within the dump limits was being adhered to during mining operations. The results and distribution of sampling can be found in Table 9.1 and Figure 10 respectively. NAG materials were found on the dump limits - samples WRF\_1\_20191220, WRF\_2\_20191220, and WRF\_3\_20191220 all yielding <0.2% Sulphur, and samples - WRF\_4\_20191220 and WRF\_5\_20191220 yielding more elevated sulphur values in the centre portion of the dump where PAG is to be deposited. The results in Table 9.1 support adherence to the Plan with respect to material placement at the WRF.

Operational testing of waste rock generated by mining operations at Deposit No. 1 continued to be conducted throughout 2019 to inform the management and deposition of PAG and NAG waste rock at the Project. The testing methods employed are outlined in the Project's Life-of-Mine Waste Rock Management Plan (BAF-PH1-830-P16-0031) and involve the on-site sampling and analysis of blast hole cuttings for total sulphur content and on select samples additional supporting Acid Base Accounting (ABA) parameters, such as the Neutralization Potential Ratio (NPR). The operational testing results provide the



basis for determining the appropriate waste rock classification: PAG or NAG. Waste rock analyzed to have a sulphur concentration less than 0.20% was classified as NAG material while waste rock analyzed to have a sulphur concentration greater than 0.20% was classified as PAG material. All PAG waste rock generated in 2019 was deposited at the WRF in accordance with the Phase 1 Waste Rock Management Plan, the Interim Waste Rock Management Plan, and the WRF QA/QC program. The 2019 operational testing results for waste rock material generated in 2019 are presented in Appendix E.6.

As part of the ongoing waste rock geochemical evaluation program, eight (8) thermistor series at varying depths and locations throughout the WRF were installed in late 2018 and early 2019 to characterize the thermal conditions of the WRF. Realtime thermal data as well as oxygen and pressure monitoring data has been continuously acquired from each of these instruments throughout 2019. The accrued thermistor data from 2019 has been downloaded by Baffinland technical staff was issued to Golder for interpretation and assessment, for inclusion in the update to the Phase 1 Waste Rock Management Plan. A waste dump thermal profile has been built from this data which will be used to inform future waste rock and ARD/ML management practices as well as water quality modelling at the WRF. Preliminary data from the thermistors indicate that the WRF is frozen at depth, with a seasonal active layer, demonstrating that the placement of waste rock to date has promoted the aggradation of permafrost, consistent with the long term management and closure objectives of the WRF.

Baffinland continued to optimize the Project's near-term waste rock deposition and management strategies in 2020. This includes the newly amended Phase 1 Waste Rock Management Plan – BAF-PH1-830-P16-0029 (Appendix E.6). In addition, Baffinland will be implementing the use of paste pH testing in compliment to current blast hole geochemical testing to be rolled out in early 2020, for the purpose of screening material that may contain soluble sulfide material. This added metric for testing of waste rock will aid in characterizing and identifying PAG/NAG materials within the deposit.

## 9.7 RECLAMATION RESEARCH

During 2019, Baffinland implemented a re-vegetation reclamation research program to inform and refine progressive and final reclamation practices to ensure the closure objectives are met. Baffinland retained Environmental Dynamics Inc. (EDI) to complete a desktop study of revegetation practices in the Arctic, as well as design and implement a revegetation survey and preliminary reclamation trial. EDI reviewed available information from other northern mining facilities in Canada and the USA, and found that the common theme is that the Arctic environment poses significant constraints on reclamation and revegetation as a result of many factors including arctic growing conditions and the relatively short seasons. Natural patterns of cover vegetation are commonly sparse and/or intermittent, and patterns of revegetation succession and associated soil forming processes are slow.

The revegetation survey was intended to document existing post-disturbance conditions at historically disturbed sites, initiate reclamation trials to evaluate methods and approaches for surface preparation and promotion of revegetation, and identify opportunities for future research. Several test plot locations were assessed for diversity and abundance of vegetation, and test plots using different surface

preparation techniques were established during a site visit in July 2019. Results of the desktop review and preliminary survey and trial are presented in Appendix E.10.

## 10 REGULATORY INSPECTIONS AND COMPLIANCE

### 10.1 REGULATORY INSPECTIONS

Throughout 2019, Baffinland hosted numerous inspections and audits from CIRNAC, NIRB, ECCC and the QIA, as well as the WSCC Mines Inspector. Table 12.1 summarizes the 2019 site visits to the Project by the various agencies in 2019. Appendix E.15 includes responses to outstanding 2019 inspection reports.

#### 10.1.1 CIRNAC Inspections

CIRNAC Water Resources Officers conducted three (3) inspections of the Project in 2019. The dates of the inspections are as follows:

- January 23-24;
- May 22-23; and
- September 16-19.

Inspection results were conveyed during close-out meetings at the Project and documented in Water Licence Inspection Reports distributed to Baffinland follow each inspection. 2019 CIRNAC Water Licence Inspection Reports and Baffinland's responses are provided in Appendix E.8.1.

#### 10.1.2 QIA Inspections

The QIA conducted three (3) inspections/visits of the Project in 2019 under the Commercial Lease. The dates of the inspections/visits are as follows:

- May 20-21;
- July 16-17; and
- October 23.

In addition to the inspections, the QIA conducted one (1) environmental audit from August 16 - 19, 2019.

The findings from the audit and inspections were conveyed during the close-out meetings and documented in subsequent reports and correspondence. The available QIA inspection reports along with Baffinland's responses are provided in Appendix E.8.2 of this report.

#### 10.1.3 ECCC Inspections

ECCC Enforcement Officers conducted one (1) inspection in 2019, beginning July 8 and ending July 11. Inspection results were conveyed during a close-out meeting following the inspection and documented in subsequent correspondence.

#### 10.1.4 Workers' Safety and Compensation Commission (WSCC) Mine Inspections and Visits

The Workers' Safety & Compensation Commission (WSCC) conducted eight (8) inspections/visits of the Project in 2019. The dates of the inspections and visits are as follows:

- June 7;
- June 14 – 17;
- July 31 - August 1;
- August 27;
- October 23;
- November 20;
- December 2; and
- December 11.

Reports generated from these inspections and visits were distributed to Baffinland management as well as Baffinland's Occupational Health & Safety (OHS) Committee. The 2019 inspections and visits resulted in directives being issued to the Company over the course of the year. All directives were reviewed by the management team and responses were sent to the Mines Inspector within a timely manner. The results of the inspections are provided in Appendix E.8.3 of this report.

## 10.2 REGULATORY ENFORCEMENT ACTIONS

As shown in Table 10.0, during 2019 no enforcement actions were issued to the Project by federal or territorial regulators.

### 10.2.1 Waste Rock Facility

During the summer of 2017, the development of Acid Rock Drainage and Metal Leaching (ARD/ML) at the WRF in combination with the WRF Pond liner becoming compromised resulted in non-compliant effluent discharges at the WRF

As a result of the concerns identified and non-compliant effluent discharges at the WRF in 2017, CIRNAC issued an Inspector's Direction to Baffinland on September 5, 2017 followed by the QIA and ECCC issuing notifications to Baffinland on September 7, 2017 and September 13, 2017, respectively, that both parties had initiated investigations into the 2017 events at the WRF.

In response to the concerns identified and non-compliant discharges, Baffinland developed and implemented several immediate corrective actions in 2017 to ensure compliance regarding the management of waste rock and effluent at the WRF. These actions were summarized and provided to regulators in the Project's 2017 QIA and NWB Annual Report for Operations.

Baffinland continues to remain committed to addressing the identified concerns and maintaining compliance in the management of waste rock and effluent at the WRF. Industry best practices and procedures planned for the WRF to maintain compliance are detailed in the Project's most recent revisions of the Phase 1 Waste Rock Management Plan (December 2019; Appendix E.5), MDMER Emergency Response Plan (BAF-PH1-830-P16-0047) and Fresh Water Supply, Sewage and Wastewater

Management Plan (BAF-PH1-830-P16-0010). Key corrective actions executed in 2020 included the inspection, repair and expansion of the WRF Pond to mitigate the inferred source of the seepage.

On February 20, 2020, Baffinland received an email from Environment and Climate Change Canada Environmental Enforcement Division informing Baffinland that ECCC had concluded its investigation in regards to the WRF, specifically in regards to:

1. Fisheries Act subsection 36(3) - An effluent seepage and overflow identified during an ECCC on-site inspection on August 23-24, 2017 from the Waste Rock Stockpile Sedimentation Pond (MS-08) located at the BIMC, Mary River Project.
2. Metal Mining Effluent Regulations - Failing to comply with requirements under sections 4 to 31 set out in the Regulations. This notification information was received from Spill Reports 2017-289, 2017-312, 2017-328, 2017-361 and 2017-361 that were submitted to the NT/NU spills line.

Based on the information collected during the course of the investigation and consistent with the Compliance and Enforcement Policy for the Habitat Protection and Pollution Prevention Provisions of the Fisheries Act, Baffinland was informed that ECCC has decided to close the investigation and not take any enforcement actions related to the investigation that was opened on September 13, 2017 under the Fisheries Act and the Metal and Diamond Mining Effluent Regulations.

## 11 AMENDMENTS – PENDING AND COMPLETED

### 11.1 TYPE 'A' WATER LICENCE

Although no amendments to the Type 'A' Water Licence were completed in 2019, on August 16, 2018, Baffinland submitted an application to the NWB to amend the Type 'A' Water Licence to support the Project's Phase 2 Proposal. On May 5, 2019 Baffinland submitted updated documentation to the NWB for the Phase 2 Proposal, including updated monitoring and management plans, as well as issued for construction drawings. At the end of 2019, the Project's Phase 2 Final Environmental Impact Statement (FEIS) and associated Type 'A' Water Licence amendment application continued to proceed through the review and approvals process facilitated by the NIRB and NWB.

### 11.2 COMMERCIAL LEASE

#### 11.2.1 Options Exercise Notices

Under Section 3 of the Commercial Lease, the 'Options Exercise Notice (OEN) process' allows Baffinland to propose amendments to the limits and classifications of Inuit-Owned Lands captured under the Commercial Lease. During 2019, Baffinland submitted one (1) Options Exercise Notice to the QIA for review and approval. Details of the submissions are summarized in Table 11 and discussed below:

- Milne Inlet Relay Tower – An OEN was submitted to QIA on June 13, 2019 for upgrades to the Project's communication network, involving the installation of a light relay station near the peak of Cape Kwaunang, located on the east side of Milne Inlet. Approval of the OEN was issued by the QIA on July 5, 2019. No work was completed at this location in 2019, as it was determined that the relay station was not required following on Site testing of connectivity between the Bruce Head camp and Milne Inlet. At this time, no future development at this location is planned.
- Aerodrome Aviation Safety – An OEN was submitted to QIA on November 4, 2014 for grade adjustments to two (2) hill crests in the approach path of the Mary River aerodrome. The leveling of these areas was required to improve aviation safety at the Project. Approval of the OEN was issued on June 2, 2015. The grade adjustments were deferred from the 2015 Work Plan, but were completed in 2019. As-built documentation will be submitted to the QIA in Q2 of 2020.

#### 11.2.2 Tote Road Adjustment Notices

Finalized and implemented in 2019, the Tote Road Reconciliation Agreement between Baffinland and the QIA requires that Baffinland submit for QIA's review and approval a "Tote Road Adjustment Notice" (TRAN) for significant upgrades and realignments of the Tote Road. As the approval of the Roads Management Plan from QIA is still pending, no TRANs were approved by the QIA during 2019.

## 12 PUBLIC CONSULTATIONS

Throughout 2019, Baffinland continued to consult with the North Baffin communities and organizations, regarding on-going construction activities at the Project, operations and the 2019 shipping season, progress regarding employment from the North Baffin communities, environmental monitoring activities and results, and future phases of the Project. Baffinland's senior management team continued to participate in these meetings. In addition, there were various stakeholder and government visits and tours of the Project. The list of meetings held during 2019 and visits to Project sites are presented in Tables 12.0 and 12.1.

### **13 SUMMARY OF PROJECT PLANS FOR 2020**

The 2020 Work Plan was prepared and provided by Baffinland to relevant parties on November 1, 2019 as required under Section 6.1 of the Commercial Lease and under Part J, Item 3 of the Type 'A' Water Licence, for the purposes of an Annual Security Review for activities undertaken on an annual basis.

The 2020 Work Plan described the planned development and operation of the mine, ore crushing and land transportation, stockpiling and marine shipment of ore, and the continued development and construction of infrastructure required at Milne Port, the Tote Road, and the Mine Site.

The continued operation and development of the Project as described in the 2020 Work Plan will require a 2020 sealift. It is expected that sealifts carrying fuel, equipment and supplies for use at the Mine Site and Milne Port will occur during the open-water season (July to October) in 2020. Material, fuel and supplies required for operations and construction activities will be transported to the Mine Site year round via the Tote Road.

The Project's Phase 2 Proposal continues to proceed through the review and approvals process facilitated by the NIRB and NWB.

Project environmental monitoring programs prescribed by the Project Certificate, water licences, authorizations, management plans and environmental effects monitoring plans will continue through 2020.

Operation of Steensby Port and the Mid-Rail camp to support operational activities are not anticipated to be required during 2020. The Bruce Head camp is expected to be operation in 2020 to support wildlife monitoring programs during the shipping season.



**14 REFERENCES**

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