



31 March 2016

ADEC - Division of Water
Compliance and Enforcement Program
555 Cordova Street
Anchorage, AK 99501

RE: APDES Permit Number AK-004320-6
2015 Annual BMP and Storm Water Monitoring Report

Attached please find the Hecla Greens Creek Mining Company Annual Best Management Practices and Storm Water Monitoring Report for year 2015 activities.

The APDES permit was renewed in 2016 (effective October 1st, 2016), however a majority of the monthly inspections and all of the yearly stormwater monitoring was completed under the guidance of the previous (2005) permit. Therefore, this report was prepared as per Sections II.F.1 and II.F.2, of APDES (2005) Permit Number AK-004320-6, and includes the following:

- Summary of the comprehensive site evaluations/inspections performed
 - Major observations related to implementation of BMP Plan
 - Corrective actions take as a result of inspection findings
- Modifications made to the BMP Plan
- Description of the quantity and quality of storm water discharged, and any incidents of potential noncompliance
- Annual Certification statement, signed in accordance with Permit Part V.E.

Authority over the federal permitting, compliance and enforcement NPDES program transferred to the State of Alaska in November of 2010 for the mining industry. A hard copy of this report and certification will be mailed to ADEC-Division of Water, Compliance and Enforcement Program in Anchorage.

Should you have any questions regarding this report, please feel free to contact me at (907) 790-8473 or cwallace@hecla-mining.com

Sincerely,

A handwritten signature in blue ink that reads "Christopher Wallace".

Christopher Wallace
Environmental Affairs Manager

Attachment (1)

cc: T. Pilon – ADEC
W. Collingwood - ADEC
M. Reece – Forest Service

I. Introduction

This 2015 Best Management Practices (BMP) and Storm Water Report is submitted by Hecla Greens Creek Mining Company (HGCMC) pursuant to Sections II.F.1 and II.F.2 of APDES Permit AK-004320-6, effective 1 July 2005. Authority over the federal permitting, compliance and enforcement NPDES program transferred to the Alaska Department of Environmental Conservation (ADEC) in November of 2010 for the mining industry. The ADEC reissued APDES Permit AK-0043206 on 20 August 2015, with an effective date of 1 October 2015. Storm water monitoring performed in 2015 was completed prior to the effective date of the reissued permit; and, therefore was performed in accordance with the requirements of the previous permit. The reissued permit contains additional requirements for monitoring receiving water quality associated with the storm water outfalls, which HGCMC will implement with the 2016 storm water monitoring program.

This report summarizes the scope and dates of the comprehensive site compliance inspections/evaluations, major observations related to implementation of the BMP plan, corrective actions taken as a result of the inspections/evaluations, identification of potential incidents of noncompliance as they pertain to the BMP plan, description of the quantity and quality of the storm water discharged, and BMP plan modifications made during the year. The final section of this report contains the required annual certification under Section II.F.2.

II. Comprehensive Site Compliance Inspections/Evaluations, Incidents of Potential Noncompliance and Associated Corrective Actions

1. AK-CESCL Site Compliance Inspections

In April 2014, three Technicians and two Engineers in the Environmental department attended the 2-day Alaska Certified Erosion and Sediment Control Lead (AK-CESCL) storm water training program. The training program outlines the key elements of a storm water pollution prevention plan; provides detailed instructions on how to select, install and maintain storm water best management controls; and teaches how to conduct site inspections and monitoring. The class was developed with input from the USACE Alaska district, ADOT, ADEC, ADNDR, ARRC, MOA and Alaska construction industry representatives. The AK-CESCL certification is for a period of three years from the date of the training.

Monthly storm water and BMP inspections were completed by certified inspectors, and can be considered site compliance inspections. The results of the inspections conducted in 2015 generally involved the need for maintenance activities to existing BMPs. Records of these inspections are retained onsite and are available upon request. Items noted as deficiencies during the 2015 inspections, as well as the corrective actions taken, included:

- Maintenance of ditches and BMPs around the Hawk Inlet camp facilities was performed in May.
- After winter, most of the settling sumps along the road were 'mucked' out. Also maintenance of ditches and hydroseeding was completed in the summer months.

- Rock filter berms were added to various sections of the B-Road ditch to slow the flow velocity, reduce scour and promote solids settling.
- In September sediment under the Zinc Creek Bridge was removed, existing silt fencing was repaired, and additional straw wattles were installed.
- During the September inspection it was discovered that bear activity had torn a section of the liner in the storm water collection pond at Site E. New liner will be installed in the pond prior to commencing additional removal of Site E material.

All inspections were conducted as outlined in the BMP plan, and copies of the inspection forms are available upon request.

2. Agency Site Compliance Evaluation Inspections

Agency personnel performed routine inspections to evaluate compliance with HGCMC operating plans and permits on seven occasions in 2015. Each of these inspections was led by personnel from the U.S.D.A. Forest Service, and four of the inspections included a representative from the Alaska Department of Natural Resources, and ADEC personnel participated in two of the inspections. The primary focus of these inspections is on compliance with the HGCMC BMP Plan. Action items noted on the Forest Service inspection reports include:

- Minor housekeeping issues at the 920 Maintenance Shop were noted in January.
- Torn liner in the storm water pond at Site E was noted in September.
- Concern about accumulated sediments and water at the entrance to the 1350 Adit was noted in October.
- Maintenance of BMPs in the Zinc Creek Bridge area was noted in December.

Progress in 2015 included work on corrective and preventive actions from inspections, on continuous improvement projects on the various storm water outfall sites, as well as on improvements to BMPs. The list below summarizes the 2015 work and improvements, as well as plans for 2016:

- *Storm Water Outfall 003 Hawk Inlet*

Additional sampling of contributing flows to this outfall in 2009 had found a number of small seeps with elevated metal concentrations from waste rock foundation areas. Investigations into capturing these small seeps and rerouting them to containment led to a storm water containment improvement project at Hawk Inlet. It was determined that in order to capture the seeps and the water reporting to Outfall 003, the storm water collection capacity at Hawk Inlet needed to be expanded. In 2010, two 93,000 gallon water storage tanks were installed adjacent to the existing degritting basin (DB04) at Hawk Inlet. Tanks in this location are meant to disturb the least amount of useable space (vertical tanks minimize footprint). The tanks will also provide storm surge storage capacity. Water will be pumped from these tanks to the water treatment plant.

In 2010, primary construction elements for this project included subgrade excavation, grading, concrete forming and pour, placing the tanks onto the pad, and mechanical connections for filling and draining the tanks. In 2011, minor piping and mechanical work on the tanks was completed, a new boot wash was commissioned, and a network of small seepage collection sumps with pumps was installed to collect the seepage and the Outfall 003 waters, and these flows were

captured and sent to the water treatment plant. The last of these seepage collection systems was installed in April 2013.

- Storm Water Outfall 005.2 Zinc Creek Bridge

In 2015 accumulated sediment was cleared from underneath the bridge and existing BMPs were maintained. In an effort to reduce the amount of sediment that accumulates under the bridge, HGCMC initiated a field test with HDPE liner installed beneath the bridge decking. In October, a sheet of 80-mil HDPE liner was laid over the bridge surface and extended approximately one-foot up the side rails. New wood decking was placed on top of the liner to secure it in place. The intent is to provide an impermeable barrier to prevent sediment laden runoff from passing through the bridge decking and into the BMPs below. The area will be monitored in 2016 and evaluated to determine if HDPE liner on the bridge is a viable BMP strategy that should be maintained.

During a Forest Service inspection on 16 December 2015, it was noted that BMPs near the south bridge abutment were not performing adequately and needed maintenance. The BMPs are located below a culvert that conveys runoff from the road, and consist of a sediment sump and straw wattles. Due to the many years of the culvert being in place, drainage from the sump had created channelized flow that allowed sediment to be transported and deposited a considerable distance into the forest. To remedy this, HGCMC cleaned and enlarged the sediment sump, installed several silt fences, gravel filter berms and straw wattles, and directed the outflow from the sump to a different location into the forest duff. HGCMC is also currently investigating methods to improve the BMPs for managing runoff from this section of the road.

- Storm Water Outfall 005.3 Site E

A surveyed quantity of 20,498 cubic yards of waste rock was hauled from Site E to the tailings facility in July 2015 as part of the tailings expansion project. Prior to commencing the haulage, the grading of Site E was verified to ensure surface runoff would be directed to the storm water pond at the northern end. Road rock was also hauled in and placed to establish a clean road for haul trucks and minimize the potential for tracking of contaminants onto the B-Road. Water captured in the storm water pond was pumped to Pond 7 at the tailings facility throughout the summer.

During a routine inspection in September, after haulage activities had ceased for the year, it was discovered that the liner in the storm water pond had been torn, presumably by bears. HGCMC plans to replace the liner in the pond in the spring of 2016.

- Storm Water Outfall 006 Pond D

To significantly increase HGCMC's ability to manage large storm water flows from the 920 area, improvements have been made to the Pond D site. In 2009, these improvements included installation of a larger pump system to increase pumping capacity. Also, Pond D pyritic berm material was removed and replaced with clean, low permeability fill. The improvements at this site have prevented Pond D from overflowing to Greens Creek during large storm events. The auxiliary entrance road to D-Pile was reshaped to redirect the water to Pond D in October 2012 to address an action item from an ADEC inspection. Monitoring in 2015 showed that no overflows occurred from Pond D under normal operating conditions or during storm events.

- Storm Water Outfall 007 Pond C

In 2010, a pad was constructed at the 860 in the proximity of Pond C and a lined diversion channel was installed on the up gradient side of the pad to convey noncontact waters from the western portion of the backslope diversion directly to Bruin Creek, thereby avoiding any mixing with contact waters from the 920 Area. This diversion minimized the volume of water routed to treatment, as well as decreased the probability of a discharge to Greens Creek from Pond C during storm events.

An intermittent seep was observed on the exterior of the lower Pond C berm, indicating that the Pond C pump back system in the lower pond was not operating effectively. To address this, work completed at Pond C in 2011 included lining the upper pond and installing a pump system. The upper Pond C area was excavated and an underdrain, lined collection pond, caisson, and duplex pump system were installed. The lower Pond C caisson now pumps to upper Pond C which is then pumped to the Site 23 ditch along the B Road which reports to treatment. The 860 Area stormwater flow from the B Road routes to the upper Pond C.

During 2012, arctic pipe and heat trace were installed on the upper Pond C discharge line that transmits water to the Site 23 ditch. The headwall for the discharge pipe that collects the noncontact water flows above the 860 Pad was also installed during 2012. Work performed in 2015 included removal of sediment from the upper pond. Monitoring in 2015 showed that no overflows occurred from Pond C under normal operating conditions or during storm events.

- Storm Water Outfall 009 Site 1350

In April 2015, approximately 162 cubic yards of waste rock were removed from the slope adjacent to the 1350 adit, which was part of the old road to the ventilation ports. The excavated material was placed in the re-muck pile and immediately hauled into the underground mine for disposal. In order to stabilize the slope, approximately 180 cubic yards of clean fill material was hauled in to replace the excavated material. The disturbed area was then hydroseeded to re-establish vegetation.

During the fall of 2015, HGCMC performed exploration drilling and rehabilitation work within the 1350 adit level in support of future mining operations. As part of this work, control measures were put in place within the 1350 adit to reduce the volume of sediment and drainage water that accumulates at the adit entrance. HGCMC also mucked out sediments at the adit entrance to ensure effective operation of the drainage collection system.

- Containment Improvements at the 920 Area and Site 23

Three projects were completed at the 920 Area and Site 23 in 2015 to improve the collection and containment of storm water and mine drainage:

- At the 920 warehouse, the roadway and parking/storage pad were built up with approximately 3 feet of material and graded to improve drainage and collection of runoff into the de-grit basin (DB-01) and Pond A. The warehouse roof was also extended on the north side of the building to allow materials/supplies to be stored with less exposure to precipitation. The improved drainage helps ensure protection of Cub Creek and the intake to the potable water system in the event of a product spill at the warehouse.

- A storm water conveyance channel was constructed on the lower face of Site 23 using a pre-fabricated flexible HDPE ditch lining system (SmartDitch®) to route runoff from the upper portions of Site 23 to the lined Site 23 ditch along the B-Road. SmartDitch is a leak-free channel lining system with a corrugated design to help regulate the flow in the steep gradient channel. This stabilized channel will prevent erosion and reduce sediment accumulation in Pond 23.
- The Site 23 ditch along the B-Road at the toe of Site 23 was reconstructed in 2015. The existing liner and accumulated sediments were removed and it was excavated to remove unsuitable subgrade material. Clean fill material was hauled in, placed and compacted to establish the proper dimension and profile to convey the design peak flow rate of 7,000 gpm. The ditch was then lined with geotextile and 45-mil reinforced polypropylene liner. The reconstructed Site 23 ditch ensures adequate containment of mine drainage runoff from Site 23 and storm water runoff from the B-Road.
- Summary of Plans for 2016
 - Increase the capacity and reline Pond 23.
 - Reline the storm water pond at Site E.
 - Improve BMPs in the area of the Zinc Creek Bridge.
 - Test polymer application on approved sections of the B-Road to evaluate effectiveness at controlling fugitive dust and reducing erosion.

3. HGCMC Monthly Evaluations and Site Inspections

HGCMC environmental staff members conduct weekly, monthly and quarterly visual inspections of a variety of areas within the mine site to identify any potential breaches that may lead to pollutants entering the permitted outfalls, storm water drainage system, or surface waters. The results of the inspections conducted in 2015 generally involve maintenance activities to existing BMPs. Records of these inspections are noted on various inspection sheets (i.e., SPCC inspection forms, General Plan of Operations inspection forms, etc.), are retained on-site, and are available upon request. Any corrective actions needed to address findings from the inspections are conducted with coordination between the environmental department staff, the maintenance department staff, or the surface operations department staff.

Under the BMP Plan, monthly inspection sheets are completed for each outfall. A BMP Inspection Record Form is then completed for each month. This form compiles the dates of the inspections, as well as any noted deficiencies onto one page for all the outfalls, for easier tracking of corrective actions. All inspections were conducted as outlined in the BMP plan, and are available upon request.

III. BMP Plan Modifications in 2015

The HGCMC BMP Plan was updated in 2015 as required by the reissued APDES Permit. The BMP Plan addresses all components and facilities associated with the Greens Creek Mine. A

copy of the Plan is available on-site and upon request. An electronic copy of the Plan was provided to the Forest Service and ADEC in December 2015.

IV. HGCMC 2015 Annual Storm Water Monitoring Report

Storm water monitoring samples for 2015 were collected in April and August. Receiving water sampling, which was initiated in 2005 under the reissued permit, continued during 2015.

Table 1, 2015 Storm Event Details, summarizes the precipitation and duration data associated with the sampling events that occurred in 2015.

| Table 1: 2015 Storm Event Details | | | | |
|--|-----------------------------|----------------|-----------------|----------------|
| Sample Date | Mine/Mill Site (920) | | Tailings | |
| | 4/11/2015 | 8/12/2015 | 4/11/2015 | 8/12/2015 |
| SAMPLE EVENT | | | | |
| Duration (hours) | 38.75 | 14.25 | 38.25 | 14.5 |
| Started | 4/10/2015 2:00 | 8/12/2015 4:00 | 4/10/2015 6:30 | 8/12/2015 3:30 |
| Precipitation (inches) | 0.7 | 1.05 | 0.65 | 1.01 |
| Same Day Precip. (inches) | 0.24 | 1.05 | 0.17 | 1.01 |
| PRIOR EVENT | | | | |
| Lapse Between Events (hours) | 4.5 | 5 | 14 | 7.25 |
| Duration (hours) | 50.5 | 20.25 | 52.25 | 17.75 |
| Started | 4/7/2015 19:00 | 8/11/2015 2:45 | 4/7/2015 12:15 | 8/11/2015 2:30 |
| Precipitation (inches) | 1.08 | 0.78 | 1.28 | 0.69 |

Table 2, Storm Water Outfall Area and Estimated Total Discharge Volume, presents the estimated total gallons of storm water discharged through the outfalls that were sampled. These discharge estimates were calculated using the rational method equation. Note that with the 2015 update of the BMP Plan, the figures associated with each storm water outfall were revised, and the catchment areas were recalculated based on updated high resolution LiDAR aerial imagery. The actual drainage area acreage for each outfall is lower than the conservative estimates that were provided in previous annual reports, and results in a more accurate estimation of the total discharge gallons during each storm event.

| Outfall | Date | Catchment Area (acre) | Total Discharge (gallons) |
|---------|-----------|-----------------------|---------------------------|
| 003 | 4/11/2015 | 0.2 | 2,541 |
| 003 | 8/12/2015 | 0.2 | 3,884 |
| 005.2 | 4/11/2015 | 0.6 | 3,271 |
| 005.2 | 8/12/2015 | 0.6 | 4,994 |
| 005.3 | 4/11/2015 | 6.8 | 61,793 |
| 005.3 | 8/12/2015 | 6.8 | 94,332 |
| 005.4 | 4/11/2015 | 1.9 | 13,814 |
| 005.4 | 8/12/2015 | 1.9 | 21,088 |
| 008 | 4/11/2015 | 0.7 | 5,082 |
| 008 | 8/12/2015 | 0.7 | 7,771 |
| 009 | 4/11/2015 | 3.3 | 23,989 |
| 009 | 8/12/2015 | 3.3 | 36,622 |

Table 3, 2015 Storm Water and Receiving Water Results, presents the required monitoring parameters for each outfall and any associated receiving water sites. The 2005 NPDES Permit required receiving water sites to be sampled annually. For 2015, the receiving water monitoring was performed during the spring storm event. The reissued APDES Permit requires receiving water monitoring in the spring and fall, and at both upstream and downstream sites associated with each storm water outfall. This revised monitoring program will be implemented in 2016.

| Outfall | S=Storm R=Receiving | Site Number | Sample Date | Time | Reason for No Sample | Flow (gpm) | pH, Field (su) | Hardness (mg/L) | Lead-TR (µg/L) | Zinc-TR (µg/L) | TSS (mg/L) | Oil & Grease (mg/L) |
|--------------|------------------------|------------------|-------------|-------|----------------------|------------|----------------|-----------------|----------------|----------------|------------|---------------------|
| 003 | S | 527 | 4/11/15 | 16:21 | | 0.5 | 6.6 | 106 | 103.8 | 163 | 68 | <2.4 |
| | S | 527 | 8/12/15 | 15:15 | | 6 | 7.48 | 121 | 9.7 | 95 | 16 | <2 |
| | R | 529 | 4/11/15 | 16:11 | | | 8.03 | 2960 | 0.8 | 24 | 24 | <2 |
| 004 | S | 520 | 4/11/15 | 15:54 | No Flow | 0 | | | | | | |
| 005.2 | S | 539 | 4/11/15 | 14:31 | | 1 | 4.29 | 81 | 4.4 | 28 | <5 | <2 |
| | S | 539 | 8/13/15 | 10:10 | | 1 | 4.27 | 44 | 6.3 | 54 | <5 | <2 |
| | R | 368 | 4/11/15 | 14:11 | | | 7.41 | 34 | <0.1 | 7 | <5 | <2 |
| 005.3 | S | 545 | 4/11/15 | 12:09 | | 40 | 7.58 | 223 | 3.6 | 504 | <5 | <2 |
| | S | 545 | 8/12/15 | 14:15 | | 100 | 7.44 | 173 | 104.4 | 673 | 220 | <2 |
| 005.4 | S | 547 | 4/11/15 | 12:33 | | 2 | 7.7 | 54 | <0.1 | 3 | <5 | <2.1 |
| | S | 547 | 8/12/15 | 14:35 | | 15 | 7.47 | 95 | <0.1 | 2 | <5 | <2 |
| Greens Creek | R | 591 ^a | 4/11/15 | 13:09 | | 11340 | 7.64 | 61 | 0.4 | 7 | <5 | <2.1 |
| 005.5 | S | 560 | 4/11/15 | 10:50 | No Flow | 0 | | | | | | |
| 006 | S | 562 | 4/11/15 | 11:35 | No Flow | 0 | | | | | | |
| 007 | S | 565 | 4/11/15 | 11:45 | No Flow | 0 | | | | | | |
| 008 | S | 570 | 4/11/15 | 10:40 | | 3 | 7.28 | 183 | 1.3 | 63 | 11 | |
| | S | 570 | 8/12/15 | 11:30 | | 5 | 7.41 | 205 | 0.6 | 42 | 5 | |
| Greens Creek | R | 54 ^b | 4/11/15 | 11:25 | | 11340 | 7.58 | 56 | <0.1 | 9 | <5 | <2 |
| 009 | S | 580 | 4/11/15 | 10:07 | | 5 | 7.05 | 195 | 0.3 | 435 | <5 | |
| | S | 580 | 8/12/15 | 11:50 | | 35 | 7.35 | 125 | 1.5 | 664 | 7 | |
| | R | 585 | 4/11/15 | 10:15 | | 75 | 7.34 | 62 | 8.9 | 122 | 9 | <2 |

a. Site 591 is the receiving water site for Outfall 005.3 and 005.4

b. Site 54 is the receiving water site for Outfall 007 and 008

Generally, the water quality results for this year are in the historical range for each of the sites, with a few exceptions as discussed below.

- At Outfall 003, total recoverable lead and total suspended solids were elevated during the April sampling event. The concentrations of each were below the maximums measured at this outfall, but were the highest concentrations measured since the installation of seepage collection systems beginning in 2011. The flow was measured at only 0.5 gpm and the seepage collection systems were functioning as designed at the time of the sampling. The source of the lead and sediment is unknown, but may have been associated with winter snow plowing in the catchment area of the outfall.
- At Outfall 005.3, total recoverable lead and total suspended solids were elevated during the August sampling event. The concentrations of each were below the maximums measured at this outfall, but were the highest concentrations measured since 2009. This sampling event occurred shortly after completing waste rock removal activities at Site E. The elevated solids likely resulted from the loaded Volvo haul trucks on the B-Road causing degradation of the aggregate road base, which contributed excess sediment to the BMPs during the storm event. The elevated lead may have resulted from tracking by the haul trucks from Site E, despite HGCMC's best efforts to maintain a clean haul road over the waste rock.
- At Outfall 009, total recoverable zinc levels were significantly lower than those measured during the 2014 storm events, but were still elevated with respect to historical monitoring. Total recoverable lead concentrations measured in 2015 were also significantly lower than those measured in 2014, and were lower than several of the past measurements. It was anticipated that there would be a short term increase in metals concentrations following the 2014 waste rock removal activities that occurred in the catchment area above the storm water outfall. The 2015 monitoring results support HGCMC's expectation that the water chemistry will continue to improve as the site stabilizes from the reclamation disturbance.

For outfalls that are paired with specific receiving water sites, the data are presented together in Table 3. The location of storm water outfalls are shown in Figure 1. The relative metal loadings shown in the table continue the typical fluctuations, often approaching or exceeding an order of magnitude for all sites, reflecting the widely varying precipitation conditions at the HGCMC site. Storm frequency and intensity continues to exhibit high variability, resulting in the differing monitoring results, both within and between years, as well as between sites.

V. Certification

Fulfillment of requirements set forth in Permit AK-004320-06 are met with the above report, the inspections and evaluations for 2015, and the BMP plan.

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



Christopher Wallace
Environmental Affairs Manager
Hecla Greens Creek Mining Company

Photographs



PHOTO 1. Lower section of reconstructed Site 23 Ditch and lower section of SmartDitch that conveys storm water off upper portions of Site 23 (September 2015).



PHOTO 2. Waste rock removal from Site E (16 July 2015). Note the clean material placed for the haul road.

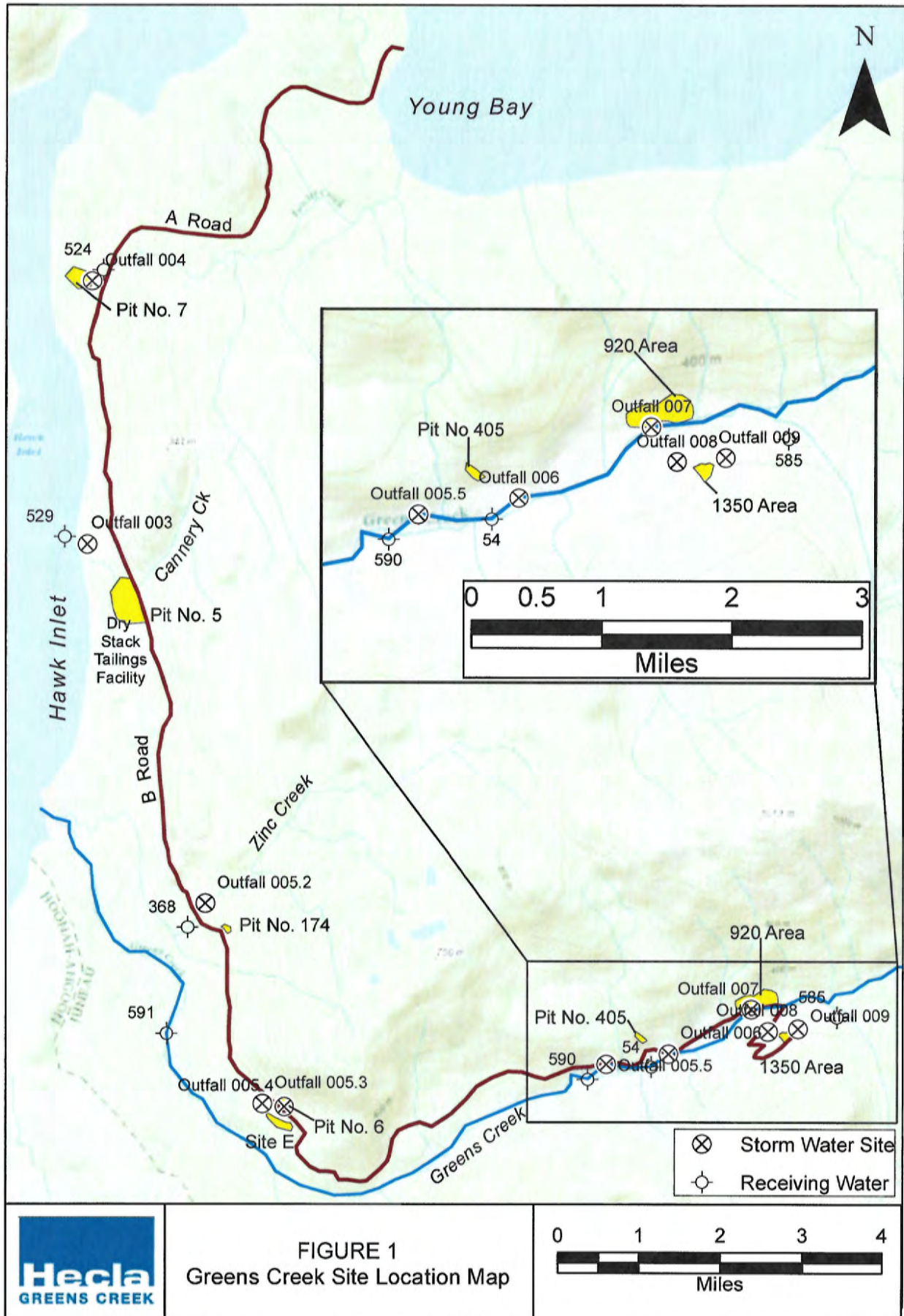


FIGURE 1
Greens Creek Site Location Map

