APPENDIX E.3

Streamflow Data for Type 'A' Water Licence
Monitoring Locations – SNP Hydrometric Report

2024 Surveillance Network Program

Hydrometric Monitoring Report

Mary River Project

Baffinland Iron Mines Corporation

Version	Issue Date
0	March 23, 2025

Prepared by:
North Water Environmental

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TABLES IN REPORT

TABLES AND FIGURES (ATTACHED)

1. INTRODUCTION

A monitoring requirement of the Mary River Project's (the Project) Type 'A' Water Licence - 2AM-MRY1325 – Amendment No. 1 (Type 'A' Water Licence), issued to Baffinland Iron Mines Corporation (Baffinland) by the Nunavut Water Board (NWB), is to measure and document the surface water flow volumes at or near locations established under the Project's Surveillance Network Program (SNP), prescribed by the Type 'A' Water Licence. To ensure compliance with the monitoring requirement, a hydrometric monitoring network consisting of nine (9) monitoring stations at or near existing SNP monitoring stations was established in 2014. Table 1 summarizes the locations monitored during 2024, including their IDs, station types, and the data collected. The locations of the SNP monitoring stations have stayed consistent across the Project operation and are shown on Figure 1 (attached).

Table 1 2024 SNP Hydrometric Monitoring Stations

Station ID	Hydrometric Station Type	Data Collected
MQ-C-B MQ-C-D MS-C-A/B	Hydrometric station installed using natural channel control.	Discharge and water level were measured during sampling events to validate stage-discharge relationships. Pressure transducers were used to measure water levels at 15-minute intervals.
MP-Q1-02 MP-C-B MP-C-K MS-MRY-13A MQ-C-A MS-C-E	Hydrometric station installed using a flow measurement structure and thin plate weir.	Water levels were measured during sampling events. Pressure transducers were used to measure water levels at 15-minute intervals.

2. METHODS AND DATA COLLECTION

An initial site visit was conducted at each station in June 2024 to install the pressure transducers, measure flow, and perform maintenance as required. The stations were installed as soon as practical following the stream channel and station locations becoming ice free. As in previous seasons, flow monitoring is not possible with ice in the channel as the melting process continuously modifies the stage discharge relationship. The majority of the freshet occurred before some of the stations were able to be installed, due to ice presence. Follow up site visits were subsequently conducted in June, July, August, and September to measure flow, water level, and download data from the pressure transducers. Most pressure transducers were removed by September 14 at the onset of freezing conditions. Two stations (MS-C-A/B and MS-C-E) were not fully frozen at that time and the pressure transducers were left installed. The second half of September and early October was unseasonably warm and the remaining two loggers were removed on October 11.

Water level data were recorded at each station at 15-minute intervals. Daily discharge at each station was calculated by averaging the 15-minute data on a daily basis.

3. RESULTS

The daily discharge data recorded at the SNP Hydrometric Stations during 2024 are provided in Table 2, Table 3, and Table 4. The daily discharge data for the SNP Hydrometric Stations at the Milne Port are displayed on Figure 2 and the stations at the Mine Site on Figure 3 and Figure 4.

4. DISCUSSION

The Mary River Project Final Environmental Impact Statement (FEIS), includes three potential effects on surface water quantity in the Milne and Mine Site Local Study Areas (LSA) (Baffinland, 2012):

- Water withdrawal;
- Water Diversion; and
- Runoff or Effluent Discharge.

Previous analysis of hydrometric data shows that there is considerable variability in monthly flow within each year and there is also considerable variability in the runoff from year to year (SEI, 2018). The natural variability in stream flow is high as it is controlled primarily by spatial and temporal variability in snow cover, snow melt which is transient in the wind blown tundra environment, and rainfall. Detecting potential changes in water quantity is challenging as the predicted effects from water withdrawals, diversions, and discharges would typically be well within the range of natural variability and in some cases be below quantifiable limits.

The only water quantity effect that was expected to be measurable within the Milne Inlet LSA is the withdrawal of fresh water from Km32 Lake. None of the Milne SNP sites monitor water quantity into or out of Km32 Lake, and as such the SNP hydrometric data cannot be compared to the effects of the water withdrawal predicted in the FEIS. The flows at the Milne Inlet SNP stations in 2024 were consistent with past data, with no significant trends in discharge was observed. This is consistent with the FEIS in that no effects to water quantity were predicted in the Milne Inlet LSA other than the withdrawal at Km32 Lake.

Water quantity effects within the Mine Site LSA that were carried through the effects assessment included freshwater withdrawal, freshwater diversion, and runoff or effluent discharge (Baffinland, 2012). Water withdrawal was anticipated to be from Camp Lake, water diversions were expected to occur around the Waste Rock Stockpile, the Open Pit, and the Ore Stockpile Platform, and effluent was expected to be discharged from the Waste Rock Stockpile, the Ore Stockpile, and the Sewage Treatment Plant.

None of the SNP monitoring stations are located at the outlets of the catchments used in the effects assessment and as such would not be expected to see the full predicted changes in water quantity. However, several of the SNP stations are located within the SDLT-1 and MR-10 catchments. The predicted effects to the MR-10 catchment are presented in the FEIS (Baffinland, 2012). The predicted effects to the SDLT-1 catchment in the FEIS were updated in KP, 2021a and the effects of the water management measures currently proposed are summarized in KP, 2021b. A summary of the predicted effects and corresponding SNP monitoring station within the two catchments is provided in Table 5.

Table 5 Summary of Predicted Effects on Water Quantity

Catchment	Predicted Effect	SNP Monitoring Station
SDLT-1	Reduction in flow of up to 26% due to diversions and corresponding increase in flow up to 31% from discharge of effluent (net mean annual discharge reduction of 5%) (KP, 2021b)	MS-C-A/B, MS-C-E
MR-10	Reduction in mean monthly flow of up to 30% from diversions and increase in mean monthly flow of up to 63% from discharge of effluent (Baffinland, 2012)	MQ-C-A, MQ-C-B, MQ-C-D

The predicted effects within the SDLT-1 catchment are a reduction in flow from the Open Pit and Mine Infrastructure Areas diversions, and an increase in flow from the Mine Haul Road diversion. The monthly average flows from 2014 to 2024 at the MS-C-A/B and MS-C-E stations are provided in Table 6.

Table 6 Monthly Average Flows at MS-C-A/B and MS-C-E

Month	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
	MS-C-A/B - Average Monthly Flow (l/s)										
June*	67.0	17.5	4.6	38.7	8.6	50.0	32.0	26.3	144.4	156.5	54.3
July	51.5	29.6	7.7	19.6	42.4	39.2	20.6	64.2	42.4	99.8	61.3
August	46.4	53.5	47.8	34.1	65.9	20.3	9.1	79.1	22.2	92.1	67.2
September*	11.0		7.9	53.7			2.5	15.9	19.8	66.2	126.1
	MS-C-E - Average Monthly Flow (l/s)										
June*		0.6	0.5				4.3	2.7	4.6	3.4	2.7
July		2.4	1.7				3.6	9.4	5.1	2.6	7.7
August	17.4	5.4	5.4				2.2	12.3	8.1	8.0	8.4
September*	4.5		0.3				1.0	5.7	7.2	7.1	11.6

Note:

1. *June and September have different length data records each year due to the timing of station installation and removal

The data presented in Table 6 emphasize that there is considerable natural variability in the runoff from month to month and year to year. Patterns of drier or wetter annual runoff are evident and are generally seen among all stations within a given year, which suggests that the annual runoff trends occur on a regional scale. Despite natural variability, the average monthly flows at MS-C-A/B have been increasing, especially since the diversion of water from the Mine Haul Road, which introduced new catchment area in 2022 and beyond. There are no apparent trends in flow at MS-C-E beyond natural variability and no significant reduction in flow. This is consistent with predicted effects given the location of the MS-C-E station within the SDLT-1 catchment. High flows documented within September at all stations in 2024 are attributed to a significant rain event that occurred just prior to freeze up.

Three stations are located in the MR-10 catchment, which is predicted to see a flow reduction of up to than 30% due to diversions, and a flow increase of up to 63% due to the discharge of effluent. None of the SNP stations are located at the outlet of the catchment or downstream of the predicted diversions and discharges. Nonetheless, the MQ-C-D station, which is located downstream of the other two stations, was used to evaluate any potential effects to water quantity in that area of the MR-10 catchment. The monthly average flows from 2014 to 2024 at the MQ-C-D station are provided in Table 7.

Table 7 Monthly Average Flow at MQ-C-D

Month	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
	MQ-C-D - Average Monthly Flow (l/s)										
June*			10.7	11.8	8.1	15.5	41.3	23.3	11.5	45.1	17.9
July	17.0		3.3	6.8	13.4	19.9	13.7	19.3	2.1	13.6	15.5
August	37.4	26.2	25.7	22.5	33.3	17.1	13.9	24.3	5.3	21.8	21.7
September*	10.5		0.6	40.3		17.0	13.5	15.3	6.3	18.3	21.6

Note:

1. June and September have different length data records each year due to the timing of station installation and removal

There are no clear trends in the average monthly flow at MQ-C-D from year to year beyond natural variability associated with wetter or drier conditions. This is consistent with predicted effects since the diversions from and discharge to the MR-10 catchment are not expected to influence flow in the MQ-C-D sub-catchment.

5. CONCLUSIONS AND RECOMMENDATIONS

The weirs added and upgraded in 2019 provided reliable data throughout 2024. The stations with natural stream controls (MS-C-A/B, MQ-C-B, and MQ-C-D) were stable and continue to produce reliable flow data. No modifications to the flow structures or stations with natural controls are proposed for the 2025 season.

The flow data collected in 2024 are consistent with previous data and with the predictions in the FEIS (where the data are applicable).

To ensure compliance with the Type 'A' Water Licence, Baffinland will continue to monitor surface water flow volumes at the stations in 2025 using the established SNP Hydrometric Monitoring Program protocols.

6. REFERENCES

Baffinland Iron Mines Corporation (Baffinland), 2012. Mary River Project - Final Environmental Impact Statement. February

Knight Piésold Ltd. (KP), 2021a. Mary River Project - Mine Site Interim Water Management Plan. June 4. Ref. No. NB102-181/63-1, Rev 1.

Knight Piésold Ltd. (KP), 2021b. Hydrology Assessment - Effects of Proposed Mine Site Water Management Measures on Flows in Sheardown Lake Tributary 1 - Mary River Project. June 24. NB102-00181/71-A.01. NB21-00559.

Story Environmental Inc (SEI), 2018. Review of Mary River Project Hydrology Data. 199-06-09. August 29, 2018.

7. CERTIFICATION

This document was prepared by the undersigned.

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Table 2 - SNP Station Daily Average Discharge - June and July

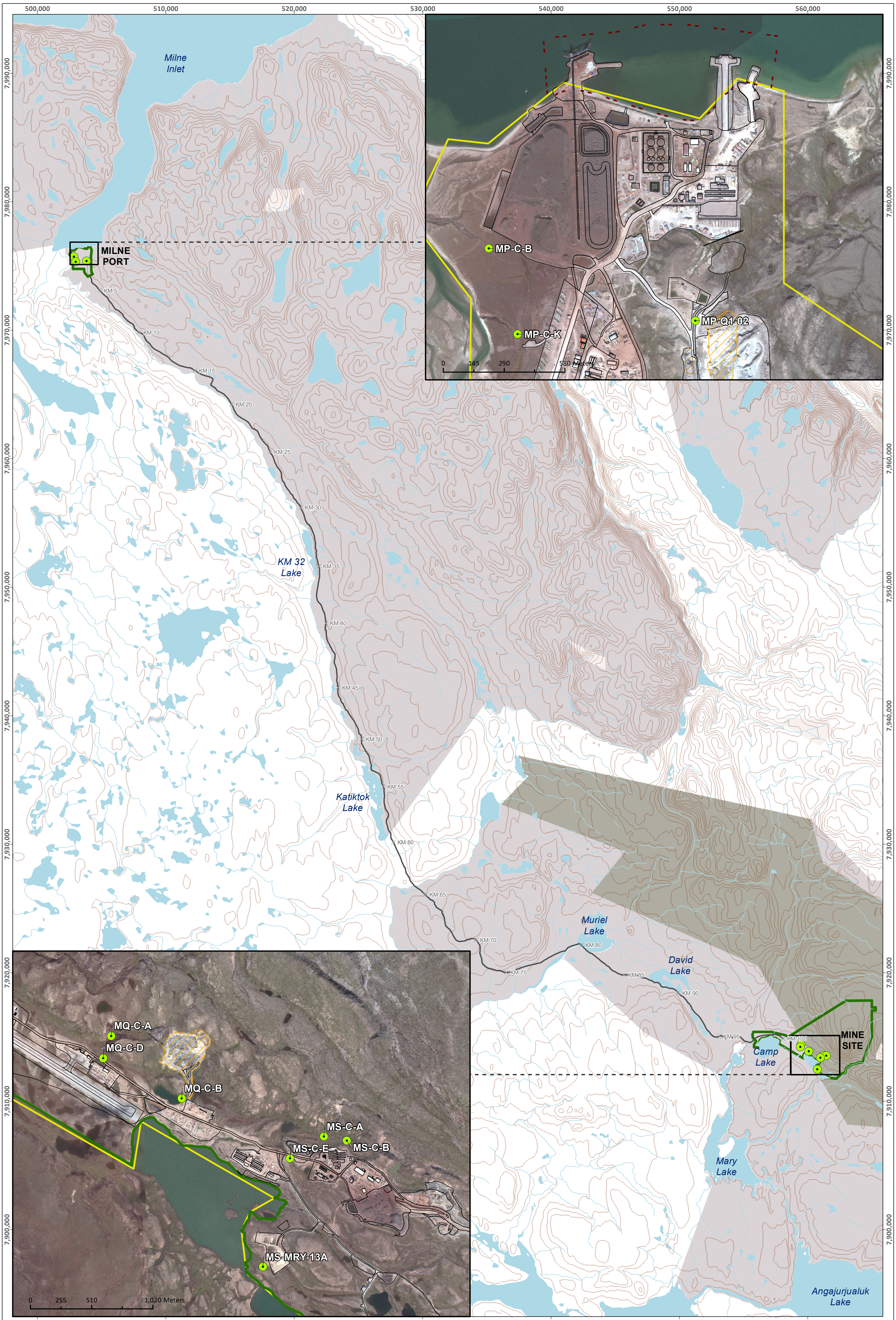
Date	Daily Average Discharge (l/s)								
	MP-C-B	MP-C-K	MP-Q1-02	MQ-C-A	MQ-C-B	MQ-C-D	MS-MRY-13A	MS-C-A/B	MS-C-E
18-Jun-24				10.5	20.6	24.8	0.108	89.7	5.3
19-Jun-24		20.4	1.12	7.1	19.6	28.9	0.046	106.4	4.9
20-Jun-24		23.8	1.37	5.3	16.1	26.8	0.026	103.9	5.5
21-Jun-24		23.9	1.60	3.7	11.7	20.7	0.015	84.9	4.9
22-Jun-24		21.9	1.7	3.6	9.9	16.2	0.013	59.4	4.7
23-Jun-24		20.0	1.5	3.8	9.2	14.0	0.012	44.0	4.5
24-Jun-24		18.9	2.1	4.2	8.5	14.8	0.009	50.2	3.4
25-Jun-24		17.9	1.6	3.4	9.3	20.7	0.011	44.1	0.5
26-Jun-24		14.5	1.5	2.9	7.3	20.0	0.012	30.3	0.0
27-Jun-24		11.1	1.3	3.2	6.7	12.6	0.011	30.2	0.0
28-Jun-24		9.3	1	1.4	5.8	9.7	0.013	30.5	0.0
29-Jun-24		7.4	1.0	1.1	5.2	9.5	0.018	18.6	0.1
30-Jun-24	8.9	5.0	1	1.2	5.3	13.5	0.024	13.0	1.4
01-Jul-24	9.6	3.8	1	1.1	5.0	15.0	0.021	27.9	4.9
02-Jul-24	17.6	5.8	0.8	5.0	12.1	25.9	0.105	47.2	9.3
03-Jul-24	18.4	8.6	1.1	6.7	18.6	41.2	0.131	78.3	14.3
04-Jul-24	19.6	13.7	1.4	6.9	20.9	38.3	0.201	125.0	16.1
05-Jul-24	29.8	27.5	2.4	10.1	34.1	62.4	0.226	217.7	21.6
06-Jul-24	19.3	21.6	1.9	3.1	15.1	35.4	0.089	161.1	15.0
07-Jul-24	15.3	16.6	1.3	2.5	10.0	20.1	0.082	113.2	13.0
08-Jul-24	11.5	12.1	1.0	1.6	7.5	13.6	0.075	95.3	11.4
09-Jul-24	9.5	9.1	0.8	2.2	6.7	10.9	0.076	74.0	6.2
10-Jul-24	9.3	8.0	0.6	1.1	6.1	9.5	0.068	64.4	5.4
11-Jul-24	6.0	7.4	0.6	1.0	5.1	7.8	0.059	49.3	4.6
12-Jul-24	3.7	6.7	0.6	2.8	5.2	11.4	0.076	40.7	4.9
13-Jul-24	2.8	6.5	0.6	1.4	4.6	10.4	0.053	36.5	4.5
14-Jul-24	2.4	5.5	0.5	1.1	3.3	5.8	0.040	28.8	3.2
15-Jul-24	4.4	6.7	0.6	1.9	4.2	6.4	0.070	25.7	4.3
16-Jul-24	5.0	7.3	0.6	4.4	8.4	13.9	0.058	45.0	9.1
17-Jul-24	2.1	7.3	0.6	2.0	5.7	10.9	0.023	45.0	5.8
18-Jul-24	1.2	6.0	0.5	1.3	3.5	5.2	0.005	33.0	3.0
19-Jul-24	1.2	5.9	0.4	1.3	3.1	3.0	0.001	26.9	2.2
20-Jul-24	0.6	5.0	0.4	0.6	2.9	2.6	0.001	24.3	2.4
21-Jul-24	2.2	4.9	0.4	0.6	3.3	2.7	0.001	28.2	3.0
22-Jul-24	1.5	4.9	0.4	0.7	3.3	2.7	0.000	23.7	2.7
23-Jul-24	2.7	6.2	0.6	1.6	5.2	5.7	0.040	27.0	6.2
24-Jul-24	1.9	6.8	0.5	0.8	4.5	4.9	0.002	32.3	5.0
25-Jul-24	3.1	6.5	0.6	1.9	11.2	9.3	0.058	26.7	6.1
26-Jul-24	2.9	7.3	1.1	2.3	8.5	14.9	0.014	45.7	8.5
27-Jul-24	6.3	9.1	1.0	3.6	10.2	16.1	0.056	49.7	8.8
28-Jul-24	7.8	13.2	0.6	7.4	15.0	28.1	0.054	58.0	12.6
29-Jul-24	3.5	11.2	0.5	3.1	10.2	18.1	0.048	86.4	9.6
30-Jul-24	2.5	7.9	0.5	2.1	9.1	13.6	0.023	88.2	7.5
31-Jul-24	7.2	9.2	0.8	3.0	10.2	15.8	0.021	74.6	7.7

Table 3 - SNP Station Daily Average Discharge - August to mid-September

Date	Daily Average Discharge (l/s)								
	MP-C-B	MP-C-K	MP-Q1-02	MQ-C-A	MQ-C-B	MQ-C-D	MS-MRY-13A	MS-C-A/B	MS-C-E
1-Aug-24	7.1	11.7	0.80	10.3	22.8	33.5	0.4	99.8	12.0
2-Aug-24	6.7	12.5	0.85	11.9	36.0	65.7	0.243	200.3	17.2
3-Aug-24	5.5	10.5	0.91	7.0	22.4	42.6	0.059	166.9	12.8
4-Aug-24	3.6	9.2	0.86	4.2	16.0	28.2	0.040	105.0	11.4
5-Aug-24	3.9	8.1	0.75	3.2	13.2	20.7	0.029	79.3	10.1
6-Aug-24	3.2	7.2	0.64	2.6	11.1	16.3	0.017	66.6	8.7
7-Aug-24	2.9	7.0	0.56	2.2	9.7	13.4	0.011	59.3	7.6
8-Aug-24	2.7	6.5	0.55	2.1	9.6	12.9	0.006	55.0	7.0
9-Aug-24	2.0	6.5	0.44	1.8	8.5	11.3	0	49.9	6.0
10-Aug-24	1.5	5.9	0.41	1.5	7.6	9.5	0	41.3	5.4
11-Aug-24	2.1	5.7	0.39	1.4	7.0	8.6	0	27.0	4.9
12-Aug-24	1.4	5.5	0.41	1.5	7.1	8.4	0	19.9	4.9
13-Aug-24	4.4	7.1	0.76	2.0	10.2	12.5	0	19.9	6.6
14-Aug-24	2.6	7.7	0.71	2.3	8.9	11.9	0	21.7	5.6
15-Aug-24	1.8	6.9	0.58	2.1	8.8	11.8	0	27.9	5.3
16-Aug-24	2.0	6.4	0.44	1.6	7.6	9.9	0	31.7	4.4
17-Aug-24	2.6	5.9	0.39	1.5	7.1	8.8	0	24.8	4.7
18-Aug-24	2.1	5.9	0.29	1.4	7.0	8.4	0	18.8	4.5
19-Aug-24	1.2	5.0	0.22	1.5	6.8	7.9	0	13.7	4.0
20-Aug-24	3.9	6.1	0.25	1.8	7.8	9.4	0	10.8	5.1
21-Aug-24	11.5	11.5	1.32	2.9	9.4	12.9	0	10.9	6.2
22-Aug-24	37.1	43.2	4.18	10.3	17.8	29.5	0.010	38.2	11.2
23-Aug-24	32.3	40.3	5.53	12.0	26.4	45.7	0.030	101.5	14.1
24-Aug-24	29.7	33.9	6.86	8.2	21.9	41.8	0.001	139.3	12.5
25-Aug-24	44.1	47.0	5.78	10.3	24.5	45.1	0.069	135.5	13.6
26-Aug-24	40.2	38.9	4.50	6.5	20.2	39.8	0	134.9	12.2
27-Aug-24	30.6	30.8	3.22	4.6	16.2	29.4	0	102.2	10.6
28-Aug-24	23.1	24.5	2.38	3.6	14.2	24.2	0	85.6	9.6
29-Aug-24	17.9	18.2	1.85	2.8	12.1	19.7	0	72.1	8.4
30-Aug-24	15.9	13.9	1.53	2.5	11.5	18.0	0	65.2	7.8
31-Aug-24	12.2	11.1	1.23	2.2	10.4	16.1	0	57.9	6.8
1-Sep-24	8.9	9.4	0.87	1.9	9.5	14.1	0	51.1	6.1
2-Sep-24	7.6	8.4	0.59	1.7	9.1	12.7	0	44.8	5.5
3-Sep-24	11.9	10.7	0.69	3.4	12.0	17.2	0	43.4	7.5
4-Sep-24	7.0	12.0	0.55	3.0	11.3	18.8	0	56.3	6.7
5-Sep-24	4.7	8.8	0.45	2.0	8.8	13.5	0	48.5	4.9
6-Sep-24	4.8	7.5	0.32	2.3	9.7	12.8	0	40.7	5.7
7-Sep-24	4.5	6.4	0.11	3.0	11.1	17.2	0	44.7	6.6
8-Sep-24	4.1	6.0	0.06	6.1	15.5	25.3	0.013	63.0	9.4
9-Sep-24	3.9	5.7	0.04	10.2	25.0	45.0	0.025	106.8	15.6
10-Sep-24	2.0	4.6	0.07	5.6	18.4	33.9	0	131.8	12.6
11-Sep-24	2.4	3.8	0.03	4.1	15.6	27.7		103.2	11.3
12-Sep-24	2.9	3.6	0.03					83.8	10.1
13-Sep-24	2.2	3.9	0.03					79.5	9.8
14-Sep-24	1.8	3.7	0.02					78.5	10.0

Table 4 - SNP Station Daily Average Discharge - mid-September to October

Date	Daily Average Discharge (l/s)								
	MP-C-B	MP-C-K	MP-Q1-02	MQ-C-A	MQ-C-B	MQ-C-D	MS-MRY-13A	MS-C-A/B	MS-C-E
15-Sep-24								82.0	8.3
16-Sep-24								69.7	7.2
17-Sep-24								61.3	6.5
18-Sep-24								54.9	5.8
19-Sep-24								47.4	5.0
20-Sep-24								69.3	14.4
21-Sep-24								419.0	28.6
22-Sep-24								439.2	22.8
23-Sep-24								330.5	18.3
24-Sep-24								251.2	16.6
25-Sep-24								187.7	16.1
26-Sep-24								148.8	15.4
27-Sep-24								157.6	15.1
28-Sep-24								148.6	14.9
29-Sep-24								160.1	14.8
30-Sep-24								180.6	15.6
1-Oct-24								179.7	15.2
2-Oct-24								153.7	15.5
3-Oct-24								139.7	15.5
4-Oct-24								138.5	13.9
5-Oct-24								134.3	14.8
6-Oct-24								123.4	14.8
7-Oct-24								103.4	15.7
8-Oct-24								89.1	13.4
9-Oct-24								67.8	10.7
10-Oct-24								69.3	12.3
11-Oct-24								65.8	10.8



LEGEND

- Monitoring Location
- Milne Inlet Tote Road Km Marking
- Milne Inlet Tote Road
- Contour (20 m Interval)
- Project Development Area
- Commercial Lease Boundary
- IOL Surface Only
- IOL Surface and Subsurface
- Crown Land

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2024 Surveillance Network Program
Hydrometric Monitoring Stations

Projection: NAD 1983 UTM ZONE 17N.
Base Map: © King's Printer for Ontario, 2024.
© 2024 Digital Globe, Inc.
Imagery and Infrastructure are representative as of July 2023.

Scale 1:280,000

Baffinland

FIGURE 1

SAVED: C:\Users\katie.mcguire\Documents\4 - Maps\Reporting\1_Annual\SNP-AEMP Hydrometric\2023\BIM_Fig 1 SNP Hydro_2023.mxd; 13-Mar-24

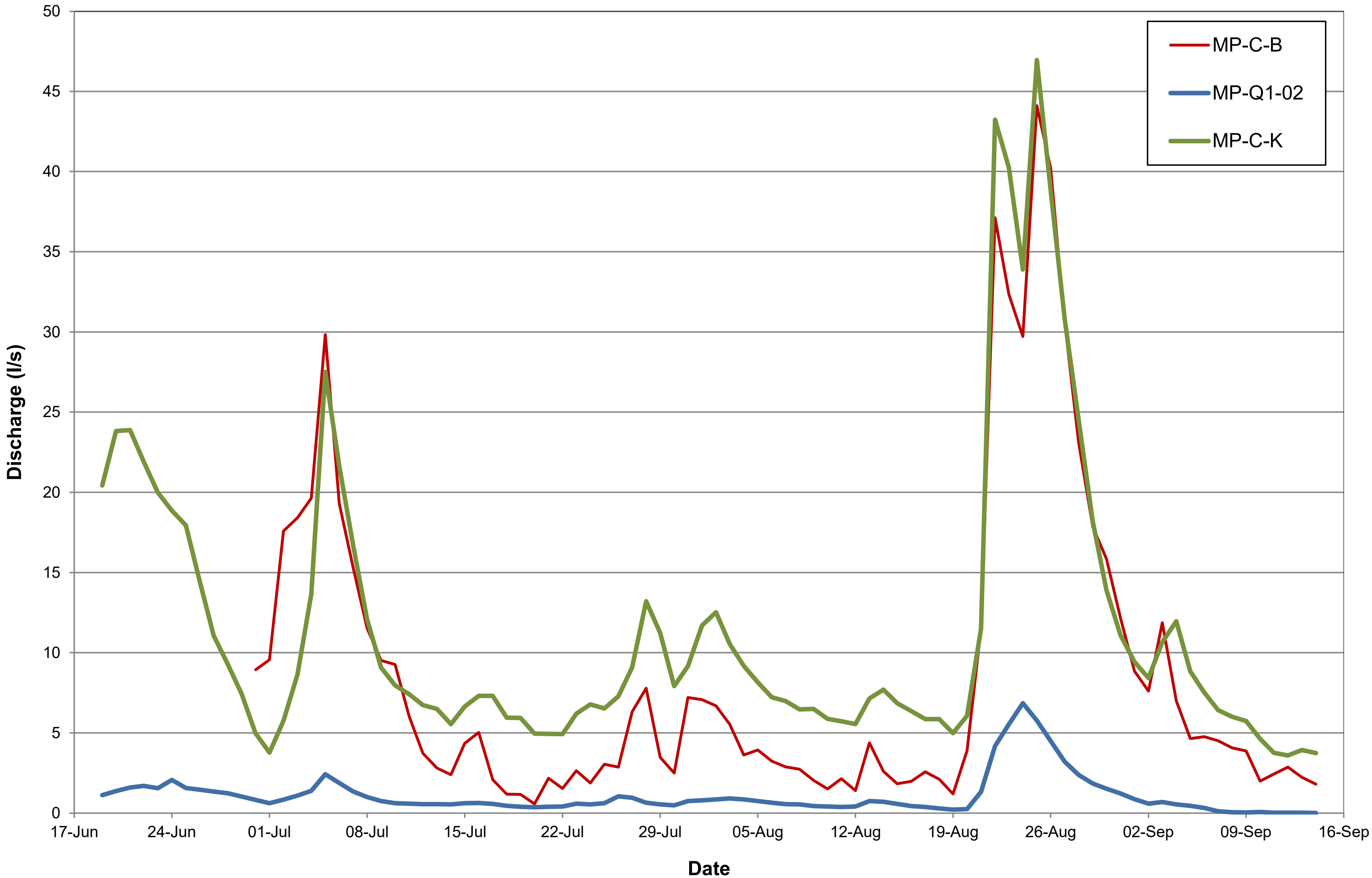

Figure 2 **Milne Port SNP Stations - Daily Discharge**

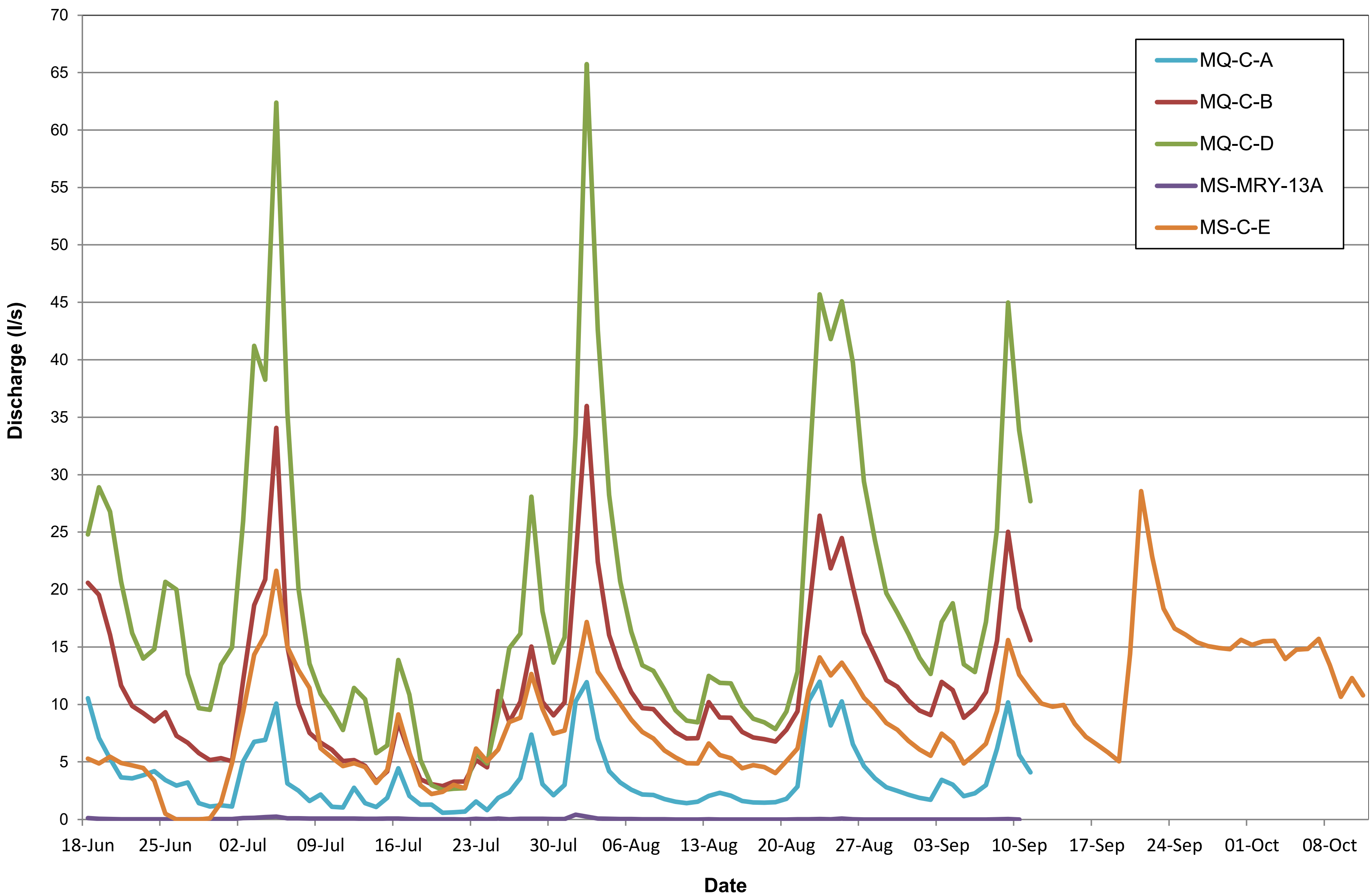

Figure 3 **Mine Site SNP Stations - Daily Discharge**

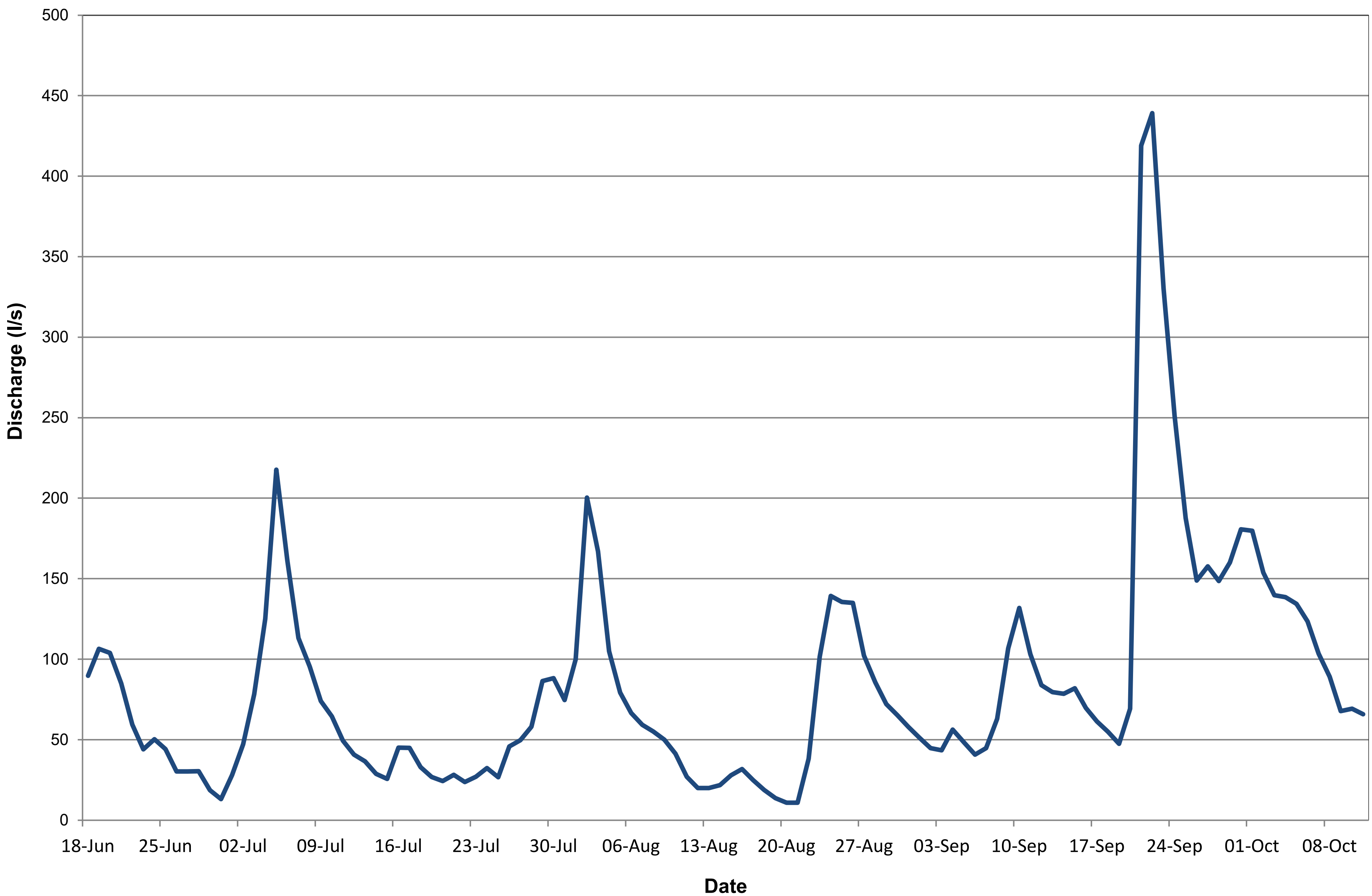

Figure 4 **Mine Site SNP Station MS-C-A/B - Daily Discharge**