FACT SHEET AND STATEMENT OF BASIS
BLX MAYFLOWER, LLC
NEW PERMIT: DISCHARGE
UPDES PERMIT NUMBER: UT0026140
MINOR INDUSTRIAL

FACILITY CONTACTS

Person Name:	Brooke Hontz
Position:	Asst. VP Development
Phone Number:	(435) 640-1941
Person Name:	Brad Rasmussen
Position:	Consultant, AQUA Engineering
Phone Number:	(801) 299-1327
Facility Name:	BLX Mayflower, LLC
Mailing and Facility Address:	2750 West Rasmussen Road, Suite 206 Park City, Utah 84098
Telephone:	(435) 640-1941
Actual Address:	TBD

DESCRIPTION OF FACILITY

Mayflower Mountain Resort is an all seasons resort to be constructed in Park City, Utah. When complete, the 5,600 acre resort will include at least seven ski lifts and will have the capacity to house more than 2,400 residents with new condos, single-family homes, townhomes, and three hotels. The property was purchased in November of 2017 by BLX Mayflower LLC (BLX Mayflower) – this property includes both inactive Mayflower and Star Mines, both of which still discharge into waters of the state. In November 2019 a pipe was installed to carry discharge water from the exit of the Mayflower Mine to McHenry Creek. Prior to this pipe, the mine discharge ran through a mine waste impoundment within Big Dutch Peat drainage which flows into Jordanelle Reservoir. The Star of Utah Mine (Star Mine) discharge water enters into Glencoe Canyon Creek, which then flows into McHenry Creek. McHenry Creek flows into Jordanelle Reservoir.

Shortly after it acquired the property, BLX Mayflower entered the State of Utah's Voluntary Cleanup Program in May 2017. Since then, BLX Mayflower has been working with the Division of Environmental Response and Remediation to address historic contamination at the Mayflower site by ensuring that soils at the site meet EPA Regional Screening Levels and Division of Water Quality (DWQ) ground water protection standards, or are otherwise contained to avoid leaving the Mayflower site in the future.

Based on Table 1 below, the abandoned mines on this property can be described as an "inactive source(s) owned by someone with activity in an area, but not mining." This establishes a medium permitting priority for the facility. Based on the 1993 letter mentioned below, the priority for this site was previously low, but was increased when BLX Mayflower LLC acquired the property to build Mayflower Mountain Resort.

BASIS FOR PERMIT DETERMINATION

Mine adits are clearly defined point sources under Section 502(14) of the Clean Water Act (CWA) 33 U.S.C. § 1362(14). Therefore under the CWA, even historic, abandoned and long-term inactive mines require a permit to discharge to Waters of the State or Waters of the United States. However, due to

extensive numbers of these abandoned mines, questionable ownerships or former mining claims and limited federal and State resources, EPA Region VIII and the states in Region VIII have not made permitting these discharges a high priority. In December of 1993, EPA Region VIII issued a letter to the States in the region with a priority list for permitting historic mines in the region.

The Wasatch Mountains have long been mined for a variety of minerals including gold, silver and lead. Mining activity in these areas can be traced back to the 1870's and continued until the 1940's when mining activities became cost prohibitive. The Mayflower Mine and Star Mines are unique as they operated until 1972, after which it no longer was profitable to operate and were abandoned. The abandoned mines are now on private land owned by BLX Mayflower. BLX Mayflower has not conducted any active mining in the area since taking over the claims, nor do they plan to in the future. BLX Mayflower is still determining whether treatment of the mine discharge for metals removal will be necessary to meet Water Quality Standards in the future.

The 1993 EPA Region VIII letter set permitting priorities for historic mines in the region and suggested applicable effluent limits.

Table 1. NPDES Priorities at Historic mines and Applicable Effluent Limits.

Priority	Situation	Basis of NPDES Limits		Storm Water Permit
		Technology	Water Quality Standards	
High	Historic sources influence by active mining.	ELG – 40 CFR 440, BPT, BAT, or NSPS	Yes	Yes, combined with traditional permit
High	Historic Sources influenced by current mining activities (significant exploration, construction, etc.)	BPJ, usually equivalent to BAT	Yes	Yes
High	Historic Sources influenced by current mining activities (minor exploration, construction, etc.)	BPJ	Yes	Yes
Medium	Inactive sources created since 1972 owned by current operator	BPJ	Yes	Yes
Medium	Inactive sources owned by operator with nearby mining operations	BPJ	Yes	Yes
Medium	Inactive sources owned by someone with activity in an area, but not mining	BPJ	Yes	Yes
Low	Inactive sources owned by someone with no activity in the area.	BPJ	Yes	Yes

Compliance Schedule:

The Mayflower site is currently under construction and, as such, there are constant changes to storm water and surface flows. This, along with other factors, has led to uncertainly about final water flow infrastructure and potential water treatment needs. Due to this future uncertainty and the need for ongoing

changes during construction, BLX Mayflower requested a compliance schedule for iron, which has been approved by DWQ; limitations can be found below. This will allow BLX Mayflower to gather a stronger data set representative of condition, as well as provide time to develop plans for flow and treatment. To protect waters of the state, the DWQ has also included trigger for adjusting the compliance schedule if necessary. At the time the final limit is instated, January 1, 2023, BLX Mayflower, must submit the Alternative Analysis Section of the Level II ADR. See ADR section later in this FSSOB for more details.

	Effluent Limitations	
Mayflower Mine Parameter	Interim Limit (Effective from permit issue till December 31, 2022)	Final Limit (Effective January 1, 2023)
Daily Maximum Iron	Monthly monitoring only*	1.194 mg/L

* If three daily maximum iron values are reported above 1.5 mg/L, compliance schedule may be adjusted.

DISCHARGE

DESCRIPTION OF DISCHARGE

Final discharge from Outfall 001 is exclusively from the inactive Mayflower Mine, and final discharge from Outfall 002 is exclusively from the inactive Star mine. There is a small additional discharge from a currently not understood origin exiting the site from the base of Big Dutch Pete. This discharge is not expected to negatively impact the receiving waters of the state, but if DWQ is presented evidence that there is potential for harm, item will be readdressed at that time. If there are any on site changes that impact Outfalls, such as additional flow as result of construction, BLX Mayflower shall notify DWQ immediately. At time this permit was issued there was additional storm water flow mixing with Mayflower Mine discharge at Outfall 001, which was piped from the base of Big Dutch Pete Hollow in the Spring of 2020 to avoid saturating the downhill mine waste repository. The storm water flow is expected to be rerouted into the Mayflower site's storm water system, once constructed.

Outfall	Description of Discharge Point
001	Located at latitude 40° 37' 15 " and longitude 111° 26' 15". The effluent is from the Mayflower Mine and flows into McHenry Creek.
002	Located at latitude 40° 36' 49.94" and longitude 111° 27' 41.82". The effluent is from the Star Mine and flows into Glencoe Canyon Creek.

RECEIVING WATERS AND STREAM CLASSIFICATION

Discharge currently flows into Glencoe Canyon Creek, which flows into McHenry Creek, or directly into McHenry Creek. McHenry Creek flows into Jordanelle Reservoir, which is fed by the Provo River. Per UAC R317-2-13.5(b), the designated beneficial uses of Provo River and tributaries from Murdock Diversion to headwaters is 1C, 2B, 3A, and 4.

Class 1C -- Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water

Class 2B -- Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.

Class 3A -- Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.

Class 4 -- Protected for agricultural uses including irrigation of crops and stock watering.

BASIS FOR EFFLUENT LIMITATIONS

Utah Administrative Code (UAC) R317-1-3.2 lists State secondary treatment standards for five-day biochemical oxygen demand (BOD5), total suspended solids (TSS), E. coli, and pH. Based on data provided in the original permit application, and because the effluent is composed only of abandoned mine water, BOD5 and E. coli limitations are not necessary, thus will not be included in this permit. However, pH and TSS are applicable to this discharge. The dissolved oxygen (DO) parameter is based on meeting water quality standards of the receiving water.

Total dissolved solids and ammonia nitrogen will not be included in this permit because there is no reasonable potential for these parameters to exceed water quality standards (effluent limitations that were derived from the wasteload allocation are much higher in concentration than that measured in the mine discharge/effluent). WET monitoring will be required for Outfall 001. Metals effluent limitations are based on the Wasteload Analysis.

Antidegradation Review (ADR)

The objective of the Level I ADR is to ensure the protection of existing uses, defined as the beneficial uses attained in the receiving water on or after November 28, 1975. No evidence is known that the existing uses deviate from the designated beneficial uses for the receiving water. Therefore, the beneficial uses will be protected if the discharge remains below the WQBELs presented in the Wasteload Analysis.

A Level II ADR is required for this facility as these are newly permitted outfalls with the potential to increase concentrations and loads of pollutants to the receiving waters. The Level II ADR requirement will not be possible to fully complete without selecting the treatment method, but all but the alternative analysis can be completed at this time.

Reasonable Potential Analysis

Since January 1, 2016, DWQ has conducted reasonable potential analysis (RP) on all new and renewal applications received after that date. RP for this permit renewal was conducted following DWQ's September 10, 2015 Reasonable Potential Analysis Guidance (RP Guidance). There are four outcomes defined in the RP Guidance: Outcome A, B, C, or D. These Outcomes provide a frame work for what routine monitoring or effluent limitations are required

A quantitative RP analysis was performed on arsenic, cadmium, iron, and zinc for both Outfall 001 and Outfall 002 to determine if there was reasonable potential for the discharge to exceed the applicable water quality standards. Based on the RP analysis, the following parameters exceeded the most stringent chronic water quality standard or were determined to have a reasonable potential to exceed the standard: iron and zinc for Outfall 001, and iron for Outfall 002. A copy of the RP analysis is included at the end of this Fact Sheet. The RP to exceed the standard for iron in Outfall 002 was based on the current dataset. The EPA ProUCL model was used to evaluate the data, which revealed one outlier. With this outlier

removed, there is no RP for iron to exceed the standard. There will be no permit limitations for Outfall 002 during this permit cycle. This will be re-evaluated at the end of this permit cycle, or when monitoring data illustrates exceedence of water quality standards.

The permit limitations are:

Parameter	Effluent Limitations Outfall 001 *a				
	Maximum Monthly Avg	Maximum Weekly Avg	Yearly Average	Daily Minimum	Daily Maximum
Total Flow, MGD	0.7	--	--	--	1.0
TSS, mg/L	25	35	--	--	--
Dissolved Oxygen, mg/L	--	--	--	5.0	--
pH, Standard Units	--	--	--	6.5	9
WET, Chronic Biomonitoring	--	--	--	--	IC_{25} > 78% effluent (from WLA)
Iron, mg/L *g	--	--	--	--	1.194
Zinc, mg/L	--	--	--	--	0.411

SELF-MONITORING AND REPORTING REQUIREMENTS

The following self-monitoring requirements are being imposed because this is a new permit. Once more data has been collected throughout this permit cycle requirements may change. The permit will require reports to be submitted monthly and annually, as applicable, on Discharge Monitoring Report (DMR) forms due 28 days after the end of the monitoring period. Effective January 1, 2017, monitoring results must be submitted using NetDMR unless the permittee has successfully petitioned for an exception. Lab sheets for biomonitoring must be attached to the biomonitoring DMR. Lab sheets for metals and toxic organics must be attached to the DMRs.

Self-Monitoring and Reporting Requirements Outfall 001 *a			
Parameter	Frequency	Sample Type	Units
Total Flow *b, *c	Monthly	Measure	MGD
TSS	Monthly	Composite	mg/L
DO	Monthly	Grab	mg/L
pH	Monthly	Grab	SU
WET – Biomonitoring *d	4 x Yearly		
Ceriodaphnia - Chronic	2nd & 4th Quarter	Composite	Pass/Fail
Fathead Minnows - Chronic	1st & 3rd Quarter	Composite	Pass/Fail
Iron *g	Monthly	Composite	mg/L
Zinc	Monthly	Composite	mg/L
Metals, Effluent *e	Quarterly	Composite	mg/L
Self-Monitoring and Reporting Requirements Outfall 002 *a			
Parameter	Frequency	Sample Type	Units
Total Flow *b, *c	Quarterly	Measure	MGD
TSS	Quarterly	Grab	mg/L
DO	Quarterly	Grab	mg/L
pH	Quarterly	Grab	SU

WET – Biomonitoring Ceriodaphnia – Chronic *f	Once during permit cycle	Composite	Pass/Fail
Metals, Effluent *e	Quarterly	Grab	mg/L

*a See Definitions, *Part VIII*, for definition of terms.

*b Flow measurements of effluent volume shall be made in such a manner that the permittee can affirmatively demonstrate that representative values are being obtained.

*c If the rate of discharge is controlled, the rate and duration of discharge shall be reported.

*d The chronic Ceriodaphnia will be tested during the 2nd and 4th quarters, and the chronic fathead minnows will be tested during the 1st and 3rd quarters.

*e All metals results were reviewed. Only arsenic, cadmium, iron, and zinc appeared to be close to the limits suggested in the Wasteload. At this time metals need to be monitored quarterly, but this may change for next permit cycle.

*f WET Testing must be conducted at the frequency listed in the table, but can be done at any time during the year to accommodate access issues.

*g Iron parameter will be **monitoring only** from permit issue through December 31, 2022. If three daily maximum iron values are reported above 1.5 mg/L, compliance schedule may be adjusted.

STORM WATER

STORM WATER REQUIREMENTS

The Mayflower site contains areas of historic mining. These inactive mines may be required to obtain coverage under the Multi-Sector General Permit (MSGP) for Storm Water Discharges Associated with Industrial Activities if storm water is coming in contact with overburden, raw material, intermediate product, finished product, byproduct, or waste product located on the site. As noted above, BLX Mayflower is participating in the Voluntary Cleanup Program to address historic mine waste at the site, including eventual elimination of storm water contact with historic mine waste rock at the facility.

BLX Mayflower and/or its contractors have obtained and must maintain permit coverage under the Construction General Storm Water Permit (CGP) for any construction at the facility which disturb an acre or more, or is part of a common plan of development or sale that is an acre or greater. A Notice of Intent (NOI) is required to obtain a construction storm water permit prior to the period of construction.

Because construction activities at the Mayflower site and participation in the Voluntary Cleanup program are ongoing, DWQ will continue to work with BLX Mayflower to require separate storm water permits, as necessary.

BIOMONITORING REQUIREMENTS

A nationwide effort to control toxic discharges where effluent toxicity is an existing or potential concern is regulated in accordance with the Utah Pollutant Discharge Elimination System Permit and Enforcement Guidance Document for Whole Effluent Toxicity Control (biomonitoring), dated February 2018. Authority to require effluent biomonitoring is provided in Permit Conditions, UAC R317-8-4.2, Permit

Provisions, UAC R317-8-5.3 and Water Quality Standards, UAC R317-2-5 and R317 -2-7.2.

The permittee is a minor industrial facility that will be continuously discharging from Outfall 001. Given the RP analysis above indicates that there is reasonable potential for toxicity to be present. Therefore, numerical WET limitations are included in the permit for Outfall 001. The facility will be required to conduct quarterly chronic WET testing, using alternating species.

Outfall 002 discharges intermittently and toxicity is neither an existing concern, nor likely to be present in the discharge, based on data collected and reported thus far. The monitoring location is located just below the two mine portals (combined shortly after existing portals and considered one discharge), before flow continues down over/ through the Star Mine waste rock and 'deer camp' waste rock. This site is currently in Phase I of construction; this flow will be addressed in Phase II. While decisions concerning this discharge are being made and the site in a state of flux, this outfall will be **monitoring only.** The permit will contain a toxicity limitation re-opener provision that allows for modification of the permit should additional information indicate the presence of toxicity in the discharge.

PRETREATMENT REQUIREMENTS

Any wastewaters discharged to the sanitary sewer, either as a direct discharge or as a hauled waste, are subject to Federal, State and local pretreatment regulations. Pursuant to Section 307 of the CWA, the permittee shall comply with all applicable federal General Pretreatment Regulations promulgated at *40 CFR Part 403*, the State Pretreatment Requirements at *UAC R317-8-8*, and any specific local discharge limitations developed by the Publicly Owned Treatment Works (POTW) accepting the wastewaters.

In addition, in accordance with *40 CFR Part 403.12(p)(1)*, the BLX Mayflower must notify the POTW, the EPA Regional Waste Management Director, and the State hazardous waste authorities, in writing, if they discharge any substance into a POTW which if otherwise disposed of would be considered a hazardous waste under *40 CFR Part 261*. This notification must include the name of the hazardous waste, the EPA hazardous waste number, and the type of discharge (continuous or batch).

PERMIT DURATION

It is recommended that this permit be effective for a duration of five (5) years.

Drafted by
Danielle Lenz, Discharge
Lonnie Shull, Biomonitoring
Lisa Stevens, Storm Water
Danielle Lenz, Reasonable Potential Analysis
Jennifer Robinson, Pretreatment
Nick von Stackelberg, Wasteload Analysis
Utah Division of Water Quality, (801) 536-4300

PUBLIC NOTICE

Began: October 9, 2020
Ended: November 9, 2020

Comments will be received at: 195 North 1950 West
PO Box 144870
Salt Lake City, UT 84114-4870

During the public comment period provided under UAC R317-8-6.5, any interested person may submit written comments on the draft permit and may request a public hearing, if no hearing has already been scheduled. A request for a public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. All comments will be considered in making the final decision and shall be answered as provided in R317-8-6.12.

ADDENDUM TO FSSOB

During finalization of the permit certain dates, spelling edits and minor language corrections were completed. Due to the nature of these changes they were not considered major and the permit is not required to be re Public Noticed.

Responsiveness Summary

There were no public comments received during the public notice period.

DWQ-2020-008062

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ATTACHMENT 1

Effluent Monitoring Data

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Effluent Monitoring Data

MAYFLOWER MINE

Dataset 1: Below is all data collected by BLX Mayflower LLC / Extell Development from July 2017 to March 2020. All parameters are reported in mg/L.

Ammonia	Nitrate	Nitrite	pH	Phosphate, Ortho as P	TDS	TSS	Antimony	Arsenic	Beryllium
<0.0500	<0.1	<0.1	7.34	<0.05	744	4	<0.005	0.00289	<0.001
<0.0500	<0.1	<0.1	7.3	<0.05	764	<4	<0.02	0.00281	<0.001
<0.2	<0.1	<0.1	7.3	<0.01	736	<4	<0.02	0.0052	<0.001
<0.2	<0.1	<0.1	7.6	<0.01	724	4	<0.02	<0.05	<0.001
<0.2	<0.1	<0.1	7.2	<0.01	744	<4	<0.02	<0.05	<0.001
<0.2	<0.1	<0.1	7.4	<0.02	776	<4	<0.02	<0.05	<0.001
<0.2	<0.1	<0.1	8.1	0.02	740	<4	<0.02	<0.05	<0.001
<0.2	<0.1	<0.1	8	0.02	724	<4	<0.02	<0.05	<0.001
<0.2	<0.1	<0.1	7.3	0.02	752	7	<0.02	<0.05	<0.001
<0.2	<0.1	<0.1	7.2	0.02	728	<4	<0.02	<0.05	<0.001
<0.2			7.6	0.04	752		<0.02	<0.05	<0.001
			7.2	0.02	684			<0.05	
								<0.05	

Cadmium	Calcium	Chromium	Copper	Iron, Dissolved	Iron, Total	Lead	Magnesium	Manganese	Mercury
<0.00050	175	<0.002	<0.005	0.59	1.38	<0.002	25.4	1.63	<0.00015
<0.00050	152	<0.002	<0.005	0.6	0.84	<0.002	23.4	1.41	<0.00015
0.0013	173	<0.005	<0.005	0.09	1.03	0.0031	25.4	1.45	<0.0002
<0.005	178	<0.005	<0.005	0.13	1.24	<0.02	25.5	1.58	<0.0002
<0.005	182	<0.005	<0.005	0.09	0.92	<0.02	27.4	1.67	<0.0002
<0.005	173	<0.005	<0.005	0.09	0.95	<0.02	26.4	1.6	<0.0002
<0.005	171	<0.005	<0.005	0.34	0.89	<0.02	24.6	1.57	<0.0002
<0.005	178	<0.005	<0.005	0.53	1.11	<0.02	25.4	1.54	<0.0002
<0.005	167	<0.005	<0.005	0.61	1.29	<0.02	24.3	1.44	<0.0002
<0.005	184	<0.005	<0.005	0.62	0.85	<0.02	26.6	1.48	<0.0002
<0.005		<0.005	<0.005	0.24	0.63	<0.02			<0.0002
<0.005		<0.005		0.3	0.59	<0.02			<0.0002
<0.005		<0.005		0.28	0.72	<0.02			<0.0002
0.0008				0.26	1.08	0.0024			<0.0000005
0.0008				0.19	0.77	0.0026			<0.0002
0.0007				0.17	0.82	0.0026			<0.0002
0.0008				0.28	0.62	0.003			<0.0002
0.0007				0.27	1.32	0.0023			<0.0002
0.0002				1.29	1.21	0.0023			<0.0002
0.0007				0.89	1.25	0.0019			<0.0002
0.0007				1.09	1.03	0.0038			<0.0002
<0.0002				0.33	0.9	0.0029			<0.0002
0.0007				0.24	0.87	0.0026			<0.0002
0.0014				0.21	1.05	0.0029			<0.0002

0.0012					0.8	0.0027			<0.00023
0.0008					0.41	<0.015			<0.0002
0.0007					1.14	0.0021			<0.0002
0.0006					0.92	0.0027			<0.0002
0.0006					2.24	<0.015			<0.0002
0.0007					1.63	0.0032			<0.0002
					1.57	0.0029			<0.0002
					1.45	0.0024			<0.0002
					1.1	0.0026			<0.0002
					0.94	0.0031			<0.0002
					1.04	0.0027			<0.0002
						0.0027			<0.0002
						0.0024			<0.0002
						0.0027			<0.0003

Nickel	**Selenium**	**Silver**	**Thallium**	**Zinc**
<0.005	<0.002	<0.002	<0.0002	0.318
<0.005	<0.002	<0.002	<0.02	0.322
<0.005	<0.0005	<0.0005	<0.02	0.54
<0.005	<0.02	<0.002	<0.02	0.39
<0.005	<0.02	<0.005	<0.02	0.43
<0.005	<0.02	<0.005	<0.02	0.41
<0.005	<0.02	<0.005	<0.02	<0.01
<0.005	<0.02	<0.005	<0.02	0.4
<0.005	<0.02	<0.005	<0.02	0.4
<0.005	<0.02	<0.005	<0.02	0.47
<0.005	<0.02	<0.005	<0.02	0.41
<0.005	<0.02	<0.005	<0.02	0.39
	<0.02	<0.005		0.41
	<0.08	<0.005		0.32
	0.0006	<0.0005		0.3
	0.0009	<0.0005		0.29
	<0.0005	<0.0005		0.35
	0.0006	<0.0005		0.42
	<0.0005	<0.0005		0.42
	<0.0005	<0.0005		0.33
	0.0005	<0.0005		0.41
	0.0008	<0.0006		0.41
	<0.0005	<0.0005		0.41
	0.0005	<0.0005		0.38
	0.0005	<0.0005		0.01
	0.0006	<0.0005		0.01
	0.0006	<0.0005		<0.01
	<0.0005	<0.0005		0.23
	<0.0005	<0.0005		<0.01
	<0.0005	<0.0005		0.17
	<0.0005	<0.0005		0.15
	<0.02	<0.005		0.32
	<0.0005	<0.0005		0.31

	<0.0005	<0.0005		0.3
	<0.0005	<0.0005		0.26
	<0.0005	<0.0005		0.29
	0.0006	<0.0005		0.31
	<0.0005	<0.0005		0.34
	<0.0005	<0.0005		

Dataset 2: Below is all data collected during Pilot Study (in October and November of 2019) conducted by Aqua Engineering - this study was conducted to test metal removing technologies. All samples below were untreated. All parameters are reported in mg/L.

pH	TDS	Antimony	Arsenic	Cadmium	Calcium	Copper	Iron
7.2	708	ND	0.0047	0.0007	153	0.0050	1.43
7.3	728	ND	0.0037	0.0007	151	0.0032	1.03
7.3	676	ND	0.0041	0.0007	154	0.0041	1.09
7.4	692	ND	0.0040	0.0007	153	0.0038	1.00

Lead	Magnesium	Nickel	Selenium	Silver	Thallium	Zinc	Manganese
0.0040	24.2	0.0099	0.0005	ND	ND	0.33	1.40
0.0027	23.4	0.0101	0.0005	ND	ND	0.32	1.36
0.0044	23.6	0.0031	ND	ND	ND	0.32	
0.0052	23.4	0.0031	ND	ND	ND	0.32	

Dataset 3: Below is all data collected by BLX Mayflower LLC / Extell after pipe bypassing mine waste was installed at the Mayflower Mine site. Pipe was installed November 2019. All parameters are reported in mg/L.

Cadmium	Iron, Dissolved	Iron, Total	Lead	Mercury	Selenium	Silver	Zinc
0.0006	0.33	1.1	0.0027	<0.0002	0.0006	<0.0005	0.29
0.0006	0.24	0.94	0.0024	<0.0002	<0.0005	<0.0005	0.31
0.0007	0.21	1.04	0.0027	<0.0003	<0.0005	<0.0005	0.34

STAR MINE

Dataset 4: Below is all data collected by BLX Mayflower LLC / Extell Development from July 2017 to March 2020. All parameters are reported in mg/L.

Ammonia	Nitrate	Nitrite	pH	Phosphate, Ortho as P	TDS	TSS	Antimony	Arsenic	Beryllium
<0.2	<0.1	<0.1	7.7	<0.01	264	<4	0.0009	0.0022	<0.001
<0.2	<0.1	<0.1	8.1	0.01	252	<4	<0.02	<0.05	<0.001
<0.2	<0.1	<0.1	7.6	<0.01	276	<4	<0.02	<0.05	<0.001
<0.2	<0.1	<0.1	8	0.02	268	<4	<0.02	<0.05	<0.001
0.2	<0.1	<0.1	8.1	0.02	264	<4	<0.02	<0.05	<0.001
<0.2	<0.1	<0.1	7.8	0.02	300	<4	<0.02	<0.05	<0.001
<0.2	<0.1	<0.1	7.7	0.03	268	<4	<0.02	<0.05	<0.001
<0.2	<0.1	<0.1	7.8	0.03	308	<4	<0.02	<0.05	<0.001
	<0.1	<0.1	7.6	0.02	248	<4	<0.02	<0.05	<0.001

Cadmium	Calcium	Chromium	Copper	Iron, Dissolved	Iron, Total	Lead	Magnesium	Manganese	Mercury
<0.0002	61.8	<0.005	<0.005	0.16	0.07	<0.0005	9.8	0.063	<0.0002
<0.005	57.5	<0.005	<0.005	0.09	0.1	<0.02	10.4	0.058	<0.0002
<0.005	64.9	<0.005	<0.005	0.12	0.12	<0.02	10.7	0.061	<0.0002
<0.005	63.4	<0.005	<0.005	0.19	0.15	<0.02	10.2	0.06	<0.0002
<0.005	64.6	<0.005	<0.005	0.06	0.14	<0.02	10.8	0.056	<0.0002
<0.005	64.5	<0.005	<0.005	0.04	0.19	<0.02	10.8	0.056	<0.0002
<0.005	66.9	<0.005	<0.005		0.21	<0.02	11.1	0.062	<0.0002
<0.005	67.7	<0.005	<0.005		0.23	<0.02	11.8	0.065	<0.0002
<0.005	72.4	<0.005	<0.005		0.20	<0.02	12.9	0.065	<0.0002
<0.005					0.35	<0.0005			0.0000016
<0.005					0.35	<0.0005			<0.0002
<0.005					0.27	<0.0005			<0.0002
<0.005					0.38	<0.0005			<0.0002
0.0004					1.19	0.0044			<0.0002
<0.005					0.13	<0.0005			<0.0002
<0.005					0.13	<0.0005			<0.0002

Nickel	Selenium	Silver	Thallium	Zinc
<0.005	0.0010	<0.005	<0.0002	<0.01
<0.005	<0.02	<0.005	<0.02	<0.01
<0.005	<0.02	<0.005	<0.02	<0.01
<0.005	<0.02	<0.005	<0.02	<0.01
<0.005	<0.02	<0.005	<0.02	<0.01
<0.005	<0.02	<0.005	<0.02	<0.01
<0.005	<0.02	<0.005	<0.02	<0.01
<0.005	<0.02	<0.005	<0.02	<0.01
<0.005	<0.04	<0.005	<0.02	<0.01

	<0.0005	<0.0005		<0.01
	<0.0005	0.0007		<0.01
	<0.0005	<0.0005		<0.01
	<0.0005	<0.0005		<0.01
	0.0006	<0.0005		0.13
	<0.0005	<0.0005		<0.01
	<0.0005	<0.0005		<0.01

ATTACHMENT 2

Wasteload Analysis

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WASTELOAD ANALYSIS [WLA] Date: 8/13/2020

Appendix A: Mass Balance Mixing Analysis for Conservative Constituents

Discharging Facility:	BLX Mayflower, Inc.		
UPDES No:	UT-0026140		
Outfall No:	001		
Permit Flow [MGD]:	1.0	Annual	Max. Daily
	0.7	Annual	Max. Monthly
Receiving Water:	McHenry Creek		
Stream Classification:	1C, 2B, 3A, 4		
Stream Flows [cfs]:	0.3	All Seasons	Critical Low Flow
Fully Mixed:	YES		
Acute River Width:	100%		
Chronic River Width:	100%		
Mixed Flow Acute Conditions [cfs]:	1.85		
Mixed Flow Chronic Conditions [cfs]:	1.38		
Mixed Hardness [mg/L]:	493.1		

Modeling Information

A mass balance mixing analysis was used to determine the effluent limits.

All model numerical inputs, intermediate calculations, outputs and graphs are available for discussion, inspection and copy at the Division of Water Quality.

Effluent Limitations

Current State water quality standards are required to be met under a variety of conditions including in-stream flows targeted to the 7-day, 10-year low flow (R317-2-9).

Other conditions used in the modeling effort reflect the environmental conditions expected at low stream flows.

Effluent Limitations for Protection of Drinking Water Sources (Class 1C Waters)

	Maximum Concentration		
	Standard	**Background**	**Limit**
Dissolved Metals (µg/L)			
Arsenic	10.0	4.7	11.0
Barium	1000	0.09	1194
Beryllium	4.0	2.0	4.4
Cadmium	10.0	2.0	11.6
Chromium	50.0	5.5	58.6
Lead	15.0	47.4	15.0
Mercury	2.0	0.006	2.4
Selenium	50.0	0.6	59.6
Silver	50.0	1.0	59.5
Inorganics			
Bromate (mg/L)	0.0	0.0	0.0
Chlorite (mg/L)	1.0	0.0	1.0
Fluoride (mg/L)	4.0	0.0	4.0
Nitrates as N	10.0	0.0	10.0
Radiological			
Gross Alpha (pCi/L)	15.0	0.0	17.9
Gross Beta (mrem/yr)	4.0	0.0	4.8
Radium 226, 228 (pCi/L)	5.0	0.0	6.0
Strontium 90 (pCi/L)	8.0	0.0	9.6
Tritium (pCi/L)	20000	0.0	23881
Uranium (pCi/L)	30.0	0.0	35.8

Effluent Limitations for Protection of Recreation (Class 2B Waters)

Physical	Concentration	
Parameter	**Minimum**	**Maximum**
pH	6.5	9.0
Turbidity Increase (NTU)		10.0

Effluent Limitations for Protection of Aquatic Wildlife (Class 3A Waters)

Whole Effluent Toxicity (WET) Limits	**Maximum**	
Dilution Ratio	0.3	:1
IC25	78%	percent effluent

Temperature (deg C)	**Maximum**
Instantaneous	20.0
Change	2.0

Dissolved Oxygen (mg/L)	**Minimum Concentration**
Instantaneous	4.0
7-day Average	5.0
30-day Average	6.5

Metals-Total Recoverable

	Chronic (4-day ave)			Acute (1-hour ave)		
Parameter	**Standard[1]**	**Background**	**Limit**	**Standard[1]**	**Background**	**Limit**
Aluminum (µg/L)	87.0	43.5	N/A	750	43.5	887
Arsenic (µg/L)	150.0	4.7	190.3	340	4.7	405
Cadmium (µg/L)	2.0	2.0	2.0	6.5	2.0	7.4
Chromium VI (µg/L)	11.0	5.5	12.5	16.0	5.5	18.0
Chromium III (µg/L)	231	2.5	294	1,773	2.5	2,117
Copper (µg/L)	29.3	25.00	30.5	49.6	25.0	54.4
Cyanide (µg/L)[2]	5.2	2.6	5.9	22.0	2.6	25.8
Iron (µg/L)		0.52		1,000	0.52	1,194
Lead (µg/L)	10.9	47.4	10.9	281	47.4	326
Mercury (µg/L)[2]	0.012	0.006	0.014	2.4	0.006	2.9
Nickel (µg/L)	168	5.0	213	1,513	5.0	1,806
Selenium (µg/L)	4.6	0.6	5.7	18.4	0.6	21.9
Silver (µg/L)		1.0		34.9	1.0	41.5
Tributylin (µg/L)[2]	0.072	0.036	0.082	0.46	0.036	0.54
Zinc (µg/L)	382	217	428	379	217	411

1: Based upon a Hardness of 400 mg/l as CaCO3

2: Background concentration assumed 50% of chronic standard

3: Where the pH is equal to or greater than 7.0 and the hardness is equal to or greater than 50 ppm as CaC03 in the receiving water after mixing, the 87 ug/1 chronic criterion (expressed as total recoverable) will not apply, and aluminum will be regulated based on compliance with the 750 ug/1 acute aluminum criterion (expressed as total recoverable).

Effluent Limitation for Protection of Agriculture (Class 4 Waters)

	Maximum Concentration		
Parameter	**Standard**	**Background**	**Limit**
Total Dissolved Solids (mg/L)	1200	376	1360
Boron (mg/L)	0.75	0.38	0.82
Arsenic, Dissolved (µg/L)	100	4.7	118
Cadmium, Dissolved (µg/L)	10	2.0	11.6
Chromium, Dissolved (µg/L)	100	5.5	118
Copper, Dissolved (µg/L)	200	25.0	234
Lead, Dissolved (µg/L)	100	47.4	110
Selenium, Dissolved (µg/L)	50	0.6	60
Gross Alpha (pCi/L)	15	0.0	18

ATTACHMENT 3

Reasonable Potential Analysis

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REASONABLE POTENTIAL ANALYSIS

Water Quality has worked to improve our reasonable potential analysis (RP) for the inclusion of limits for parameters in the permit by using an EPA provided model. As a result of the model, more parameters may be included in the permit. A Copy of the Reasonable Potential Analysis Guidance (RP Guide) is available at water Quality. There are four outcomes for the RP Analysis[1]. They are;

Outcome A:	A new effluent limitation will be placed in the permit.
Outcome B:	No new effluent limitation. Routine monitoring requirements will be placed or increased from what they are in the permit,
Outcome C:	No new effluent limitation. Routine monitoring requirements maintained as they are in the permit,
Outcome D:	No limitation or routine monitoring requirements are in the permit.

Initial screening for metals values that were submitted showed that a closer look at some of the metals is needed. The initial screening check for metals showed that the full model needed to be run on arsenic, cadmium, iron, and zinc. The initial screening check for metals showed that the full model does not need to be run on antimony, beryllium, calcium, chromium, copper, lead, magnesium, manganese, mercury, nickel, selenium, silver, and thallium.

RP was run on three different datasets. The first model was run using Dataset 1 and 2, which represents all data collected for Outfall 001. The second model was run using Dataset 3, which represents the data collected for Outfall 001 after a pipe was installed to carry water from the exit of the mine to McHenry Creek. Prior to this pipe, the mine discharge ran through a mine waste impoundment within Big Dutch Peak drainage. The third model was run using Dataset 4, which represents the data collected for Outfall 002.

Dataset 1 and 2:

The RP model was run on arsenic, cadmium, iron, and zinc using all the data available. This resulted in 17-42 data points for each constitute. The results of the models are: there is acute and chronic RP at 95% confidence and 99% for zinc (Outcome A), and there is acute RP at 95% confidence and 99% confidence for iron (Outcome A). There was no RP for arsenic or cadmium (Outcome B).

Dataset 3:

The RP model was run on cadmium, iron, and zinc using all the data available. No arsenic data was available. This resulted in 3 data points for each constitute. The results of the models are: there is chronic RP at 99% confidence for zinc (Outcome A), and there is acute and chronic RP at 95% confidence and 99% confidence for iron (Outcome A). There was no RP for cadmium (Outcome B).

Dataset 4:

The RP model was run on arsenic, cadmium, iron, and zinc using all the data available. This resulted in 9-16 data points for each constitute. The result of the model is there is acute RP at 95% confidence or 99% confidence for iron (Outcome A). There was no RP for arsenic, cadmium, or zinc. The EPA ProUCL model was used to re-evaluate the iron data, which revealed an outlier (1.19 mg/L). The model was run again with the outlier removed, which resulted in no RP (Outcome B).

A Summary of the RP Model inputs and outputs are included in the table below.

[1] See Reasonable Potential Analysis Guidance for definitions of terms

RP input/output summary

All data points are reported in mg/L.

Dataset 1 and 2:

RP Procedure Output	Outfall Number: 001 Data Units: mg/L			
Parameter	Arsenic		Cadmium	
Distribution	Lognormal		Lognormal	
Reporting Limit	0.0010		0.0010	
Significant Figures	2		2	
Effluent Data Points	17		34	
Maximum Reported Effluent Conc.	<0.05/0.0052*		<0.005/0.0014**	
Coefficient of Variation (CV)	0.23		0.48	
Acute Criterion	0.405		0.0074	
Chronic Criterion	0.1903		0.002	
Confidence Interval	95	99	95	99
Projected Maximum Effluent Conc. (MEC)	0.0069	0.0088	0.0018	0.0027
RP Multiplier	1.3	1.7	1.3	1.9
RP for Acute?	NO	NO	NO	NO
RP for Chronic?	NO	NO	NO	NO
Outcome	B		B	

*Ten out of the seventeen data points were reported as <0.05, which is higher than the Acute Criterion. To be able to run RP, these points were removed.

**Twelve of the thirty four data points were reported as <. To be able to run RP, these points were removed.

RP Procedure Output	Outfall Number: 001 Data Units: mg/L			
Parameter	Iron, Total		Zinc	
Distribution	Lognormal		Lognormal	
Reporting Limit	0.0010		0.0010	
Significant Figures	2		2	
Effluent Data Points	39		42*	
Maximum Reported Effluent Conc.	2.24		0.54	
Coefficient of Variation (CV)	0.32		1.1	
Acute Criterion	1.194		0.411	
Chronic Criterion	NA		0.428	
Confidence Interval	95	99	95	99
Projected Maximum Effluent Conc. (MEC)	2.400	3.200	0.670	1.500
RP Multiplier	1.1	1.4	1.3	2.8
RP for Acute?	YES	YES	YES	YES
RP for Chronic?	NA	NA	YES	YES
Outcome	A		A	

*Three of the forty two data points were reported as <. To be able to run RP, these points were removed.

Dataset 3:

RP Procedure Output	Outfall Number: 001 Data Units: mg/L			
Parameter	Arsenic		Cadmium	
Distribution	Lognormal		Lognormal	
Reporting Limit	0.0010		0.0010	
Significant Figures	2		2	
Effluent Data Points	0		3	
Maximum Reported Effluent Conc.	NA		0.0007	
Coefficient of Variation (CV)	NA		0.089	
Acute Criterion	0.405		0.0074	
Chronic Criterion	0.1903		0.002	
Confidence Interval	95	99	95	99
Projected Maximum Effluent Conc. (MEC)	NA	NA	0.0008	0.0009
RP Multiplier	NA	NA	1.2	1.3
RP for Acute?	NA	NA	NO	NO
RP for Chronic?	NA	NA	NO	NO
Outcome	NA		B	

RP Procedure Output	Outfall Number: 001 Data Units: mg/L			
Parameter	Iron, Total		Zinc	
Distribution	Lognormal		Lognormal	
Reporting Limit	0.0010		0.0010	
Significant Figures	2		2	
Effluent Data Points	3		3	
Maximum Reported Effluent Conc.	1.1		0.34	
Coefficient of Variation (CV)	0.080		0.080	
Acute Criterion	1.194		0.411	
Chronic Criterion	NA		0.428	
Confidence Interval	95	99	95	99
Projected Maximum Effluent Conc. (MEC)	1.300	1.400	0.400	0.4400
RP Multiplier	1.2	1.3	1.2	1.3
RP for Acute?	YES	YES	NO	YES
RP for Chronic?	NA	NA	NO	YES
Outcome	A		A	

Dataset 4:

RP Procedure Output	Outfall Number: 002 Data Units: mg/L			
Parameter	Arsenic		Cadmium	
Distribution	Lognormal		Lognormal	
Reporting Limit	0.0010		0.0010	
Significant Figures	2		2	
Effluent Data Points	9*		16**	
Maximum Reported Effluent Conc.	0.0022		0.0004	
Coefficient of Variation (CV)	NA		NA	
Acute Criterion	0.010		0.0065	
Chronic Criterion	0.150		0.002	
Confidence Interval	95	99	95	99
Projected Maximum Effluent Conc. (MEC)	0.0022	0.0022	0.0004	0.0004
RP Multiplier	NA	NA	NA	NA
RP for Acute?	NO	NO	NO	NO
RP for Chronic?	NO	NO	NO	NO
Outcome	B		B	

*Eight out of the nine data points were reported as <0.05, which is higher than the Acute Criterion. To be able to run RP, these points were removed, which only left one data point. This data point is below both Acute and Chronic Criterion, which results in Outcome B.

**Fifteen out of the sixteen data points were reported as <. To be able to run RP, these points were removed, which only left one data point. This data point is below both Acute and Chronic Criterion, which results in Outcome B.

RP Procedure Output	Outfall Number: 002 Data Units: mg/L					
Parameter	Iron, Total		Iron, Total (Outlier Removed)		Zinc	
Distribution	Lognormal		Lognormal		Lognormal	
Reporting Limit	0.0010		0.0010		0.0010	
Significant Figures	2		2		2	
Effluent Data Points	16		15		16**	
Maximum Reported Effluent Conc.	1.19*		0.38		0.13	
Coefficient of Variation (CV)	0.75		0.53		NA	
Acute Criterion	1		1		0.379	
Chronic Criterion	NA		NA		0.382	
Confidence Interval	95	95	95	99	95	99
Projected Maximum Effluent Conc. (MEC)	1.900	3.600	0.5500	0.8800	0.13	0.13
RP Multiplier	1.6	3.0	1.4	2.3	NA	NA
RP for Acute?	YES	YES	NO	NO	NO	NO
RP for Chronic?	NA	NA	NO	NO	NO	NO
Outcome	A		B		B	

*The EPA ProUCL model was used to evaluate the data. 1.19 mg/L is an Outlier. Results are below.

Dixon's Outlier Test

Number of Observations = 16

10% critical value: 0.454

5% critical value: 0.507

1% critical value: 0.595

1. Observation Value 1.19 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.785

For 10% significance level, 1.19 is an outlier.

For 5% significance level, 1.19 is an outlier.

For 1% significance level, 1.19 is an outlier.

**Fifteen out of the sixteen data points were reported as <. To be able to run RP, these points were removed, which only left one data point. This data point is below both Acute and Chronic Criterion, which results in Outcome B.

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