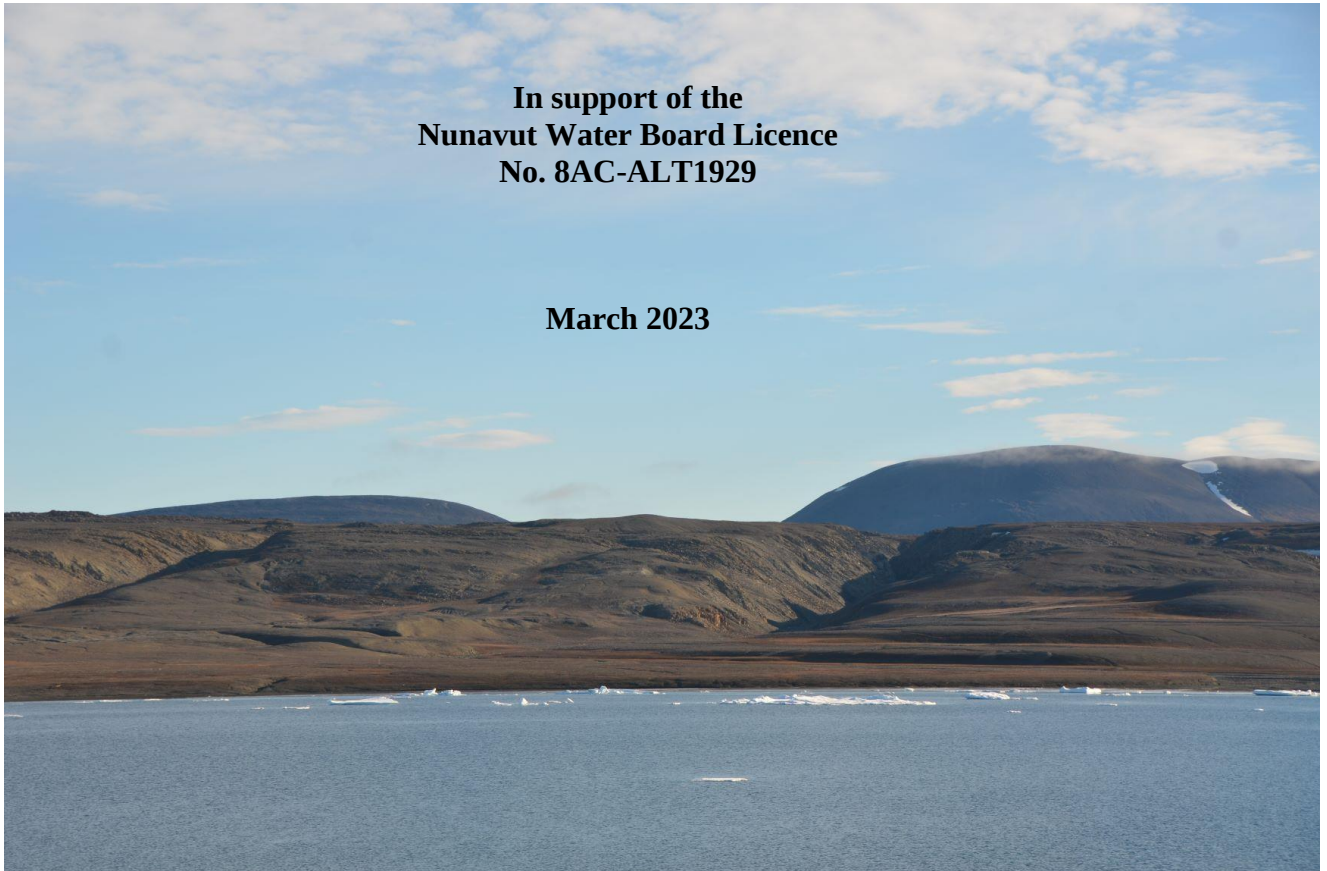




2022 Annual Report for CFS Alert, Nunavut

**In support of the
Nunavut Water Board Licence
No. 8AC-ALT1929**

March 2023



Prepared for:
Nunavut Water Board

Licensee:
RP Ops Group North
Department of National Defence

Prepared & Submitted by:
8 Wing Environmental Management,
8 Wing Trenton,
Department of National Defence

31 March 2023

Nunavut Water Board
P.O. Box 119
Gjoa Haven, Nunavut, X0B 1J0

Attention: Manager of Licensing

Subject: 2022 Annual Report for CFS Alert, Nunavut

Please find enclosed a copy of the 2022 Annual Report to the Nunavut Water Board and Executive Summary in English and Inuktitut for the following site:

1. Canadian Forces Station (CFS) Alert – 8AC-ALT1929 Type “A”

The Annual Report is being submitted by the Department of National Defence at 8 Wing/Canadian Forces Base Trenton on behalf of the licensee, the Department of National Defence at RP Ops N- ADM (IE).

Should the Nunavut Water Board have comments or require additional information regarding the Annual Report, please contact Mr. Nathan Koutroulides, 8 Wing Deputy Environment Officer, 8 Wing Environmental Management at (613) 392-2811 x4821 or by e-mail at: Nathan.Koutroulides@forces.gc.ca.

Sincerely,

Nathan Koutroulides, B.Sc, CD, PMP.
8 Wing Deputy Environment Officer, Environmental Management
Department of National Defence / Government of Canada
Nathan.Koutroulides@forces.gc.ca / Tel: 613-392-2811 Ext. 4821

encls

8 Wing Environmental Management, Room 305, 74 Polaris Avenue, Box 1000 Stn Forces, Astra, Ontario, K0K 3W0
Tel: 613-392-2811 x4821 Fax: 613-965-3368

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2022 Annual Report to the Nunavut Water Board

Licensee: Department of National Defence – RP Ops - ADM (IE)

Licence: 8AC-ALT1929 Type “A”,

Location: Canadian Forces Station Alert, Ellesmere Island,
Qikiqtani Region, Nunavut.

Report submitted by: Department of National Defence –
8 Wing/Canadian Forces Base Trenton –
8 Wing Environmental Management,
31 March 2023

Executive Summary

The 2022 annual report to the Nunavut Water Board (NWB) is a requirement under Licence Number 8AC-ALT1929 Type “A”, Part B, Paragraph 1. This annual report is for Canadian Forces Station (CFS) Alert, Nunavut. The Licence was issued on November 1st, 2019, to the Department of National Defence (DND) Real Property Operations North (RP Ops N) - Assistant Deputy Minister of Infrastructure & Environment (ADM(IE)). As 8 Wing – Canadian Forces Base (CFB) Trenton, Ontario, oversees CFS Alert, 8 Wing Trenton is filing the annual report on behalf of the new DND licensee, Real Property Operations North (RP Ops N) - Assistant Deputy Minister of Infrastructure & Environment (ADM(IE)).

For 2022, the average daily water usage at CFS Alert was 512 m³. This usage is below the 875 cubic meters daily water usage allowed by the NWB Licence. The daily water usage amount being reported is less than the daily intake amount of raw water from the source at Upper Dumbell Lake. A large portion of this usage water is directly returned (raw and untreated) to the source concurrently to the intake process, the average return amount was 433 m³/day. This constant circulatory (return) flow of the raw water prevents freezing damages to the water pipelines. The average daily water consumption amount was 78 m³. The total annual quantity of water used in 2022 was 186,967 m³.

Hazardous wastes (Glycol, batteries and hazardous liquids) were backhauled from CFS Alert in 2022 for disposal outside of Nunavut in Ontario, by external contractors. Non-hazardous domestic wastes produced from CFS Alert were directed to the designated Main Station Landfill. Annual repairs to the sewage terrace system were completed in 2022. All sewage was directed to the Sewage Terrace System.

As seen in the past, due to the COVID-19 World Pandemic CFS Alert support crew were reduced again this past year with limited visitors and contractors allowed on station to prevent unwanted spread/transmission at the Station. As such, projects like the wastewater treatment plant has been delayed several years due to limited resources allowed to visit the station. DND is in the process of completing an option analysis for this project this upcoming fiscal year as COVID related constraints are slowly being lifted. DND maintains a positive commitment to demonstrating compliance to the NWB Licence and is planning to continue the CFS Alert Surveillance Network Program capabilities in Summer 2023.

[illegible]

ለጥያቄዎ: ለጥራትና ለፍርድ ዘርፍ ተሳታፊዎች - ፎርማት ማረጋገጥ ለፍርድ ልማት (RP Ops) - ለፍርድ ዘርፍ ማረጋገጥ ለፍርድ ዘርፍ (ADM(IE))

ለፖሊስ: 8AC-ALT1929 የኔብራጋ ስቴት "A",

[illegible][illegible]

ΛΓΗΛΩΤΕΡΟ ΕΛΕΓΓΟΝΤΕΣ

[illegible][illegible]

[illegible]

Rapport annuel 2022 à l'Office des eaux du Nunavut

Détenteur du permis : Ministère de la Défense nationale – Ops Imm – SMA(IE)
Permis : 8AC-ALT1929 Type « A »,
Lieu : Station des Forces canadiennes Alert, île d'Ellesmere, région de Qikiqtani, Nunavut.

Rapport présenté par : Ministère de la Défense nationale –
8^e Escadre/Base des forces canadiennes Trenton –
Gestion environnementale de la 8^e Escadre,
31 mars 2023

Sommaire

Le rapport annuel 2022 présenté à l'office des eaux du Nunavut (OEN) constitue une exigence aux termes du permis n° 8AC-ALT1929 Type « A », partie B, paragraphe 1. Le présent rapport annuel vise la Station des Forces canadiennes (SFC) Alert, au Nunavut. Le permis a été délivré le 1^{er} novembre 2019 au ministère de la Défense nationale (MDN) – Opérations immobilières (Nord) [Ops Imm (Nord)] du sous-ministre adjoint (Infrastructure et environnement) [SMA(IE)]. Comme la 8^e Escadre/Base des Forces canadiennes (BFC) Trenton, en Ontario, supervise la SFC Alert, la 8^e Escadre Trenton présente le rapport annuel au nom du nouveau détenteur de permis du MDN, les Ops Imm (Nord) du SMA(IE).

En 2022, l'utilisation quotidienne moyenne d'eau à la SFC Alert était de 512 m³, ce qui est inférieur à la consommation quotidienne de 875 m³ d'eau autorisée par le permis de l'OEN. La quantité d'eau utilisée quotidiennement qui est déclarée est inférieure à la quantité d'eau brute puisée quotidiennement de la source du lac Upper Dumbell. Une grande partie de l'eau utilisée est retournée directement (brute et non traitée) à la source en même temps qu'elle est puisée, et la quantité moyenne d'eau retournée s'élève à 433 m³ par jour. Cette circulation constante de l'écoulement (restitué de l'eau brute) empêche le gel d'endommager les canalisations d'eau. La quantité moyenne d'eau consommée quotidiennement était de 78 m³. La quantité annuelle totale d'eau utilisée en 2022 était de 186 967 m³.

En 2022, les déchets dangereux (glycol, piles et liquides dangereux) ont été réacheminés de la SFC Alert vers l'Ontario pour être éliminés à l'extérieur du Nunavut par des entrepreneurs externes. Les déchets ménagers non dangereux produits par la SFC Alert ont été acheminés à la décharge principale désignée. Les réparations annuelles du système de traitement des eaux usées à paliers ont été effectuées en 2022. Toutes les eaux usées ont été rejetées dans ce système.

Comme nous l'avons vu par le passé, en raison de la pandémie de COVID-19 dans le monde, l'équipe de soutien de la SFC Alert a encore été réduite au cours de la dernière année. Un nombre limité de visiteurs et d'entrepreneurs ont été autorisés à se rendre à la station afin d'éviter toute propagation ou transmission du virus. Par conséquent, des projets comme l'usine de traitement des eaux usées ont été retardés de plusieurs années en raison des ressources limitées autorisées à visiter la station. Le MDN effectue actuellement une analyse des options pour ce projet au cours de la prochaine année financière, puisque les contraintes liées à la

COVID-19 sont lentement levées. Le MDN maintient son engagement positif à démontrer sa conformité au permis de l'OEN et prévoit maintenir les capacités du programme du réseau de surveillance de la SFC à l'été 2023.

NWB Annual Report 2022

NWB Annual Report

Year being reported: 2022

License No: 8AC-ALT1926

Issued Date: November 1, 2019

Expiry Date: October 31, 2029

Project Name: Canadian Forces Station (CFS) Alert, Nunavut

Licensee: Department of National Defence - Real Property Operations-ADM(IE)

Mailing Address: Real Property Operations Group
Department of National Defence
Assistant Deputy Minister (Infrastructure & Environment)
101 Col By Drive, Ottawa, ON, K1A 0K2

Name of Company filing Annual Report (if different from Name of Licensee please clarify relationship between the two entities, if applicable):

8 Wing Environmental Management
Room 308, Building 22, 74 Polaris Ave.
Department of National Defence - 8 Wing/ CFB Trenton
Box 1000, Stn Forces
Astra, Ontario, K0K 3W0

General Background Information on the Project (*optional):

Formerly: 8AC-ALT---- Type A until Oct 31, 2019.
Formerly: 3BC-ALT1015 Type B.

Licence Requirements: the licensee must provide the following information in accordance with

Part B Item 1

A summary report of water use and waste disposal activities, including, but not limited to: methods of obtaining water; sewage and greywater management; drill waste management; solid and hazardous waste management.

Water Source(s):	Upper Dumbell Lake, Nunavut.	
Water Quantity:	875	Quantity Allowable Domestic (cu.m)
	512	Actual Quantity Used Domestic (cu.m)

	Quantity Allowable Drilling (cu.m)
	Total Quantity Used Drilling (cu.m)

- Waste Management and/or Disposal
- ☒ Solid Waste Disposal
 - ☒ Sludge
 - ☐ Drill Waste
 - ☒ Greywater
 - ☒ Hazardous
 - ☒ Other:

Landfarms

Additional Details:

Appendix A: Monitoring Program Station No. ALT-1
Appendix B: Monitoring Program Stations No. ALT-2-3-13
Appendix C: Monitoring Program Stations No. ALT-4-5-6-7
Appendix D: Monitoring Program Stations No. ALT-8-9-10-11
Appendix E: June/July Analysis Results for ALT-4-8-9-10
Appendix F: Aug/Sept Analysis Results for ALT-4
Appendix G: List of Waste Disposal Activities / Copies of Movement Documents
Appendix H: Progressive and Final Reclamation Work Undertaken

A list of unauthorized discharges and a summary of follow-up actions taken.

Spill No.: (as reported to the Spill Hot-line)
Date of Spill:
Date of Notification to an Inspector:
Additional Details: (impacts to water, mitigation measures, short/long term monitoring, etc)

No Major Spills reported

Revisions to the Spill Contingency Plan

SCP submitted and approved - no revision required or proposed

Additional Details:

No revisions required.

Revisions to the Abandonment and Restoration Plan

AR plan submitted and approved - no revision required or proposed



Additional Details:

No revisions required.

Progressive Reclamation Work Undertaken

Additional Details (i.e., work completed and future works proposed)

See Appendix H.

Results of the Monitoring Program including:

The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each location where sources of water are utilized;

Details described below



Additional Details:

The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each location where wastes associated with the licence are deposited;

Details described below



Additional Details:

Results of any additional sampling and/or analysis that was requested by an Inspector

No additional sampling requested by an Inspector or the Board



Additional Details: (date of request, analysis of results, data attached, etc)

Any other details on water use or waste disposal requested by the Board by November 1 of the year being reported.

No additional sampling requested by an Inspector or the Board

Additional Details: (Attached or provided below)

Any responses or follow-up actions on inspection/compliance reports

No inspection and/or compliance report issued by INAC

Additional Details: (Dates of Report, Follow-up by the Licensee)

Any additional comments or information for the Board to consider

Due to COVID related Operational Lockdown status in Alert, the Sewage Treatment Plant program including funding was delayed several years.

Date Submitted:

March 31, 2023

Submitted/Prepared by:

Nathan Koutroulides, BSc, PMP

Contact Information:

Tel: 613-392-2811 x4821

Fax: 613-965-3368

email: Nathan.Koutroulides@forces.gc.ca

GPS Coordinates for water sources utilized

Source Description	Latitude			Longitude		
	Deg	Min	Sec	Deg	Min	Sec
	°	'	"	°	'	"
Upper Dumbell Lake	82	29	6.2	-62	28	9.5

GPS Locations of areas of waste disposal

Location Description (type)	Latitude			Longitude		
	° Deg	' Min	" Sec	° Deg	' Min	" Sec
Alert Battery Dump	82	29	16	-62	23	15.32
Alert Main Station Landfill	82	30	17	-62	20	14.89
Alert Dump # 3	82	29	18	-62	20	57.01
Landfarm (ALT-11)	82	30	40	-62	18	37.6
Millionaire's Dump	82	29	19	-62	21	30.4
Sewage Terrace/Outfall	82	29	56	-62	21	4.8
Landfarm (ALT-10, new)	82	29	58	-62	21	16

Appendix A

Monitoring Program Station No. ALT-1

Year: 2022

Name: Water Supply at Raw Water Intake

Licence Daily Water Use (to not exceed) Limit: 875 cubic metres [m³].

Results for: All Purpose Water Monitoring

Daily Water Usage Quantity: 512 cubic metres [m³].

Annual Water Usage Quantity: 186,967 cubic metres [m³].

Average Daily Water Usage at CFS Alert - 8AC-ALT1929										
Year	Month	Days	Average Daily Intake (Usage)	Maximum Daily Intake	Average Daily Returned	Maximum Daily Return	Average Daily Utilized (Consumed)	Maximum Daily Utilized (Consumed)	Metered	Quantity Utilized
[yr]	[mo]	[day]	[m3/day]	[m3/day]	[m3/day]	[m3/day]	[m3/day]	[m3/day]	[Y/N]	[m3]
2022	JAN	31	344	609	287	547	57	77	Y	10,670
2022	FEB	28	458	683	397	610	61	81	Y	12,835
2022	MAR	30	561	717	478	603	83	114	Y	16,836
2022	APR	30	561	717	478	603	83	114	Y	16,836
2022	MAY	31	532	673	462	585	70	104	Y	16,488
2022	JUN	30	301	610	231	552	70	103	Y	9,035
2022	JUL	31	459	731	384	617	75	114	Y	14,225
2022	AUG	31	608	779	518	637	90	142	Y	18,860
2022	SEP	30	597	683	519	589	78	97	Y	17,914
2022	OCT	31	607	1321	511	1118	95	203	Y	18,808
2022	NOV	31	602	701	519	610	84	142	Y	18,674
2022	DEC	31	509	687	417	580	92	97	Y	15,786
Annual Average [m3/day]:			512	743	433	638	78	116	Total Annual [m3]:	186,967
Observed Minimum [m3/day]:			301	609	231	547	57	77		
Observed Maximum [m3/day]:			608	1321	519	1118	95	203		

Average Daily Water Intake (Usage) from Source: 512 cubic metres [m³].

Average Daily Water Return to Source: 433 cubic metres [m³].

Average Daily Water Utilized (Consumed): 116 cubic metres [m³].

The usage for 2022 was in compliance with, or below the Licence Daily Water Use Limit of 875 m³.

As requested by the Board during their technical review of the 2021 Annual report, please see daily, monthly annual quantities in cubic metres not reported as averages.

January

Month	Jan.	Year	2022									
	Raw *1											
	S	TR	Supply				Return					Station
Day	PSI	PSI	PSI	Flow m³/d	read m³	total m³	PSI	0°F	Flow m³/d	Read m³	Total m³	Station Use m³
1	36	24	51	177	1,084,019	170	48	17	268	936409	115	55
2	31	22	45	185	1,084,176	157	52	17	214	936519	110	47
3	38	27	49	149	1,084,327	151	51	17	258	936606	87	64
4	35	29	53	590	1,084,936	609	48	17	341	937153	547	62
5	31	26	54	585	1,085,453	517	49	17	180	937618	465	52
6	34	22	57	555	1,086,015	562	52	16	219	938125	507	55
7	27	23	58	553	1,086,616	601	53	16	328	938,660	535	66
8	34	28	53	606	1,087,154	538	48	16	491	939,151	491	47
9	38	29	55	583	1,087,694	540	50	17	497	939,648	497	43
10	31	22	52	155	1,088,244	550	51	17	330	940,141	493	57
11	36	25	51	173	1,088,406	162	48	16	248	940,249	108	54
12	30	22	50	157	1,088,569	163	50	16	97	940,350	101	62
13	38	29	45	150	1,088,754	185	48	15	90	940,467	117	68
14	35	27	47	151	1,088,916	162	46	15	155	940,573	106	56
15	28	25	51	163	1,089,059	143	52	15	179	940,674	101	42
16	31	29	48	152	1,089,240	181	50	16	100	940,806	132	49
17	38	34	53	603	1,089,425	185	48	15	501	940,939	133	52
18	27	32	57	588	1,089,980	555	52	16	504	941,439	500	55
19	30	22	54	582	1,090,587	607	49	16	512	941,985	546	61
20	28	25	56	579	1,091,155	568	50	16	513	942,498	513	55
21	27	23	56	576	1,091,727	572	52	15	484	943,014	516	56
22	28	22	56	573	1,092,252	525	51	15	478	943,476	462	63
23	32	27	55	581	1,092,816	564	51	16	454	943,968	492	72
24	30	22	53	156	1,093,393	577	53	15	219	944,482	514	63
25	28	24	52	144	1,093,561	168	52	14	210	944,581	99	69
26	29	25	52	180	1,093,711	150	50	14	248	944,676	95	55
27	30	22	46	152	1,093,871	160	45	14	133	944,775	99	61
28	27	23	51	169	1,094,050	179	50	13	135	944,877	102	77
29	28	25	48	184	1,094,191	141	47	13	357	944,974	97	44
30	32	34	52	154	1,094,377	186	52	14	267	945,097	123	63
31	27	22	49	185	1,094,519	142	46	13	138	945,188	91	51

February

Month	Feb.	Year	2022	RT WTP Page 2 of 4 - PLANT PHYSICAL CHECKS								
	Raw *1	Distribution Loop *2										
	S	TR	Supply				Return					
Day	PSI	PSI	PSI	Flow m ³ /d	Read m ³	Total m ³	PSI	0 ^F	Flow m ³ /d	Read m ³	Total m ³	Station Use m ³
1	30	50	58	556	1,095,100	581	54	14	468	945695	507	74
2	35	50	56	567	1,095,657	557	52	14	505	946194	499	58
3	35	45	57	564	1,096,207	550	52	14	499	946692	498	52
4	30	45	57	596	1,096,818	611	51	14	496	947244	552	59
5	28	40	54	601	1,097,364	546	50	15	453	947736	492	54
6	27	42	53	604	1,097,945	581	48	15	511	948259	523	58
7	24	44	56	566	1,098,496	551	42	15	498	948,755	496	55
8	20	40	44	147	1,098,668	172	47	18	98	948,861	106	66
9	25	45	47	177	1,098,826	158	44	14	121	948,963	102	56
10	20	40	46	165	1,099,012	186	52	14	115	949,103	140	46
11	27	40	50	188	1,099,127	115	50	14	162	949,165	62	53
12	30	42	51	156	1,099,323	196	52	14	116	949,296	131	65
13	25	40	49	172	1,099,502	179	48	14	76	949,404	108	71
14	20	38	57	554	1,099,684	182	53	13	488	949,530	126	56
15	30	52	55	591	1,100,278	594	49	14	514	950,059	529	65
16	20	37	54	589	1,100,806	528	49	14	509	950,531	472	56
17	11	13	57	565	1,101,366	560	52	14	505	951,036	505	55
18	54	60	55	590	1,101,952	586	51	14	499	951,556	520	66
19	11	14	54	591	1,102,635	683	47	14	509	952,166	610	73
20	54	60	56	569	1,103,172	537	51	14	504	952,651	485	52
21	54	60	55	590	1,103,644	472	51	14	504	953,076	425	47
22	8	12	53	569	1,104,203	559	48	14	499	953,572	496	63
23	8	11	57	569	1,104,776	573	52	14	500	954,075	503	70
24	52	52	48	523	1,105,357	581	45	14	428	954,575	500	81
25	54	58	50	522	1,105,819	462	46	14	434	954,975	400	62
26	54	58	53	497	1,106,408	589	49	14	432	955,483	508	81
27	9	11	50	521	1,106,917	509	45	14	457	955,930	447	62
28	60	54	56	481	1,107,354	437	53	14	421	956,311	381	56

March

Month	Mar	Year	2022		#####							
	Raw *1	Distribution Loop *2										
	S	TR	Supply	Flow			Return					Station
Day	PSI	PSI	PSI	m³/d	Read m³	Total m³	PSI	0°F	Flow	Read m³	Total m³	
1	54	60	50	636	1,124,645	607	46	12	481	971300	519	88
2	54	60	54	588	1,125,269	624	50	13	486	971844	544	80
3	54	60	53	610	1,125,847	578	48	13	513	972348	504	74
4	54	60	53	623	1,126,347	500	48	13	510	972788	440	60
5	9	15	50	529	1,126,868	521	47	13	431	973231	443	78
6	8	11	49	533	1,127,389	521	49	14	418	973674	443	78
7	56	60	52	528	1,127,905	516	49	14	418	974,103	429	87
8	54	60	46	544	1,128,445	540	43	15	407	974,550	447	93
9	8	12	49	534	1,129,025	580	46	16	422	975,031	481	99
10	8	12	50	540	1,129,549	524	46	16	440	975,478	447	77
11	54	60	57	600	1,129,999	450	53	17	467	975,859	381	69
12	54	60	53	616	1,130,598	599	49	17	516	976,371	512	87
13	8	12	56	579	1,131,180	582	51	16	490	976,868	497	85
14	56	60	54	593	1,131,791	611	49	16	503	977,391	523	88
15	54	60	47	661	1,132,508	717	43	16	493	977,994	603	114
16	56	60	51	611	1,133,044	536	46	16	489	978,457	463	73
17	56	60	55	582	1,133,626	582	51	16	484	978,955	498	84
18	56	60	54	588	1,134,198	572	49	16	495	979,446	491	81
19	56	60	53	599	1,134,673	475	49	17	490	979,859	413	62
20	56	60	49	566	1,135,220	547	46	17	418	980,321	462	85
21	56	60	53	559	1,135,728	508	49	17	474	980,752	431	77
22	56	60	50	573	1,136,362	634	46	17	466	981,299	547	87
23	12	16	54	550	1,136,978	616	51	17	461	981,814	515	101
24	56	60	55	554	1,137,527	549	49	17	457	982,277	463	86
25	56	60	53	562	1,137,995	468	49	17	441	982,671	394	74
26	54	60	51	601	1,138,589	594	46	18	506	983,174	503	91
27	52	60	53	624	1,139,197	608	50	18	519	983,695	521	87
28	54	60	54	591	1,139,775	578	49	18	485	984,181	486	92
29	56	52	56	528	1,140,384	609	51	16	472	984,699	518	91
30	50	60	59	559	1,140,874	490	53	18	5	985,124	425	65

April

Month	April	Year	2022		P Page 2 of 4 - PLANT PHYSICAL CHECKS								
	Raw *1		Distribution Loop *2										
	S	TR	Supply				Return					Station Use m³	Duty HL
Day	PSI	PSI	PSI	Flow m³/d	Read m³	Total m³	PSI	0°	Flow m³/d	Read m³	Total m³		
1	54	60	50	636	1,124,645	607	46	12	481	971300	519	88	3
2	54	60	54	588	1,125,269	624	50	13	486	971844	544	80	3
3	54	60	53	610	1,125,847	578	48	13	513	972348	504	74	3
4	54	60	53	623	1,126,347	500	48	13	510	972788	440	60	2
5	9	15	50	529	1,126,868	521	47	13	431	973231	443	78	2
6	8	11	49	533	1,127,389	521	49	14	418	973674	443	78	2
7	56	60	52	528	1,127,905	516	49	14	418	974,103	429	87	2
8	54	60	46	544	1,128,445	540	43	15	407	974,550	447	93	2
9	8	12	49	534	1,129,025	580	46	16	422	975,031	481	99	2
10	8	12	50	540	1,129,549	524	46	16	440	975,478	447	77	2
11	54	60	57	600	1,129,999	450	53	17	467	975,859	381	69	3
12	54	60	53	616	1,130,598	599	49	17	516	976,371	512	87	3
13	8	12	56	579	1,131,180	582	51	16	490	976,868	497	85	3
14	56	60	54	593	1,131,791	611	49	16	503	977,391	523	88	3
15	54	60	47	661	1,132,508	717	43	16	493	977,994	603	114	3
16	56	60	51	611	1,133,044	536	46	16	489	978,457	463	73	3
17	56	60	55	582	1,133,626	582	51	16	484	978,955	498	84	3
18	56	60	54	588	1,134,198	572	49	16	495	979,446	491	81	3
19	56	60	53	599	1,134,673	475	49	17	490	979,859	413	62	3
20	56	60	49	566	1,135,220	547	46	17	418	980,321	462	85	2
21	56	60	53	559	1,135,728	508	49	17	474	980,752	431	77	2
22	56	60	50	573	1,136,362	634	46	17	466	981,299	547	87	2
23	12	16	54	550	1,136,978	616	51	17	461	981,814	515	101	2
24	56	60	55	554	1,137,527	549	49	17	457	982,277	463	86	2
25	56	60	53	562	1,137,995	468	49	17	441	982,671	394	74	1
26	54	60	51	601	1,138,589	594	46	18	506	983,174	503	91	1
27	52	60	53	624	1,139,197	608	50	18	519	983,695	521	87	1
28	54	60	54	591	1,139,775	578	49	18	485	984,181	486	92	3
29	56	52	56	528	1,140,384	609	51	16	472	984,699	518	91	3
30	50	60	59	559	1,140,874	490	53	18	5	985,124	425	65	3

May

Month	May	Year	2022		P Page 2 of 4 - PLANT PHYSICAL CHECKS									
	Raw *1		Distribution Loop *2											
	S	TR	Supply				Return					Station Use m³	Duty HL	
Day	PSI	PSI	PSI	Flow m³/d	Read m³	Total m³	PSI	0°	Flow m³/d	Read m³	Total m³			
1	52	60	54	608	1,141,454	580	54	45	18	985617	492	88	3	
2	54	60	56	573	1,142,059	605	52	17	491	986125	508	97	3	
3	56	60	54	623	1,142,640	581	52	18	497	986627	502	79	3	
4	10	16	53	543	1,143,242	602	50	17	440	987146	519	83	1	
5	56	60	56	569	1,143,713	471	51	17	483	987550	404	67	1	
6	54	55	50	626	1,144,285	572	45	18	514	988056	506	66	1	
7	10	9	54	590	1,144,828	543	50	18	516	988,541	485	58	3	
8	8	12	53	597	1,145,379	551	53	18	519	989,031	490	61	3	
9	54	62	58	548	1,146,052	673	54	18	468	989,616	585	88	3	
10	56	62	58	554	1,146,570	518	53	18	475	990,073	457	61	3	
11	56	60	52	531	1,147,185	615	49	18	391	990,611	538	77	2	
12	55	60	54	557	1,147,686	501	50	18	477	991,050	439	62	2	
13	10	16	54	562	1,148,291	605	51	18	480	991,581	531	74	2	
14	10	10	55	590	1,148,808	517	50	18	495	992,035	454	63	3	
15	10	15	53	584	1,149,368	560	48	18	500	992,535	500	60	3	
16	52	60	51	386	1,150,006	638	48	18	446	993,090	555	83	2	
17	7	12	45	412	1,150,369	363	44	17	322	993,395	305	58	2	
18	8	12	49	395	1,150,825	456	47	17	432	993,775	380	76	2	
19	9	15	52	385	1,151,166	341	53	16	396	994,057	282	59	2	
20	7	11	54	397	1,151,582	416	50	17	413	994,405	348	68	2	
21	6	10	52	439	1,151,977	395	50	17	393	994,736	331	64	2	
22	6	5	54	565	1,152,478	501	50	16	490	995,177	441	60	2	
23	6	11	54	568	1,153,045	567	50	19	465	995,677	500	67	3	
24	10	12	54	592	1,153,670	625	50	16	508	996,222	545	80	3	
25	10	12	54	590	1,154,240	570	50	16	489	996,716	494	76	3	
26	54	54	55	600	1,154,812	572	51	16	496	997,208	492	80	3	
27	54	62	55	592	1,155,393	581	50	17	488	997,716	508	73	3	
28	9	12	23	615	1,155,907	514	49	17	485	998,126	410	104	3	
29	9	11	56	574	1,156,467	560	52	17	494	998,669	543	17	3	
30	10	9	58	581	1,157,085	618	51	17	493	999,204	535	83	2	
31	10	9	51	296	1,157,362	277	51	17	223	999,440	236	41	2	

June

Month	June	Year	2022		P Page 2 of 4 - PLANT PHYSICAL CHECKS									
	Raw *1		Distribution Loop *2											
	S	TR	Supply				Return					Station Use m³	Duty HL	
Day	PSI	PSI	PSI	Flow m³/d	Read m³	Total m³	PSI	0°	Flow m³/d	Read m³	Total m³			
1	11	15	54	302	1,157,668	306	50	17	301	999660	220	86	2	
2	10	15	54	305	1,157,976	308	50	17	209	999899	239	69	2	
3	11	16	52	560	1,158,417	441	51	18	433	1000270	371	70	1	
4	11	16	52	552	1,158,893	476	48	18	443	1000690	420	56	1	
5	56	62	52	523	1,159,412	519	49	18	456	1001150	460	59	1	
6	56	62	57	560	1,159,965	553	50	18	435	1001633	483	70	2	
7	9	11	50	439	1,160,424	459	46	19	464	1,002,016	383	76	2	
8	56	62	45	476	1,160,836	412	43	19	404	1,002,372	356	56	2	
9	8	15	51	445	1,161,319	483	45	19	398	1,002,779	407	76	2	
10	9	14	52	463	1,161,803	484	50	19	471	1,003,195	416	68	2	
11	11	15	52	461	1,162,253	450	50	20	446	1,003,596	401	49	2	
12	12	15	53	476	1,162,679	426	49	20	424	1,003,969	373	53	2	
13	11	15	50	640	1,163,119	440	50	20	511	1,004,385	416	24	3	
14	11	15	50	640	1,163,729	610	50	20	511	1,004,937	552	58	3	
15	12	18	58	550	1,164,329	600	55	20	480	1,005,434	497	103	3	
16	12	15	54	585	1,164,875	546	51	20	554	1,005,901	467	79	3	
17	10	16	57	584	1,165,400	525	52	19	494	1,006,350	449	76	3	
18	12	15	81	137	1,165,518	118	43	16	0	1,006,366	16	102	3	
19	12	16	82	161	1,165,617	99	25	21	0	1,006,366	0	99	3	
20	9	14	82	149	1,165,677	60	23	21	0	1,006,366	0	60	3	
21	11	15	82	82	1,165,737	60	22	21	0	1,006,366	0	60	3	
22	12	16	82	88	1,165,816	79	21	21	0	1,006,366	0	79	3	
23	12	16	82	91	1,165,870	54	10	20	0	1,006,366	0	54	3	
24	12	16	82	89	1,165,921	51	10	20	0	1,006,366	0	51	3	
25	10	18	82	167	1,165,986	65	10	21	0	1,006,366	0	65	3	
26	12	16	82	111	1,166,059	73	10	21	0	1,006,366	0	73	3	
27	60	65	82	97	1,166,122	63	10	21	0	1,006,366	0	63	1	
28	12	16	82	116	1,166,225	103	10	21	0	1,006,366	0	103	1	
29	9	16	83	65	1,166,317	92	10	21	0	1,006,366	0	92	1	
30	60	65	80	167	1,166,397	80	10	21	0	1,006,366	0	80	1	

Note: The return line to Upper Dumb Bell lake was under repair. Therefor, only physical station use was reported.

July

Month	7	Year	2022		P Page 2 of 4 - PLANT PHYSICAL CHECKS									
	Raw *1		Distribution Loop *2											
	S	TR	Supply				Return					Station Use m³	Duty HL	
Day	PSI	PSI	PSI	Flow m³/d	Read m³	Total m³	PSI	0°	Flow m³/d	Read m³	Total m³			
1	60	65	82	79	1,166,481	84	10	21	0	1006366	0	84	1	
2	56	66	82	110	1,166,537	56	10	21	0	1006366	0	56	1	
3	56	66	82	76	1,166,595	58	10	21	0	1006366	0	58	1	
4	56	66	82	113	1,166,629	34	10	21	0	1006366	0	34	2	
5	15	20	82	133	1,166,703	74	10	21	0	1006366	0	74	3	
6	10	16	82	89	1,166,767	64	10	21	0	1006366	0	64	3	
7	15	20	82	113	1,166,861	94	10	21	0	1006366	0	94	3	
8	15	20	81	131	1,166,967	106	10	21	0	1006366	0	106	3	
9	15	20	53	611	1,167,599	632	48	18	508	1,006,897	531	101	3	
10	54	58	54	610	1,168,195	596	49	18	495	1,007,418	521	75	3	
11	16	20	52	607	1,168,693	498	48	18	503	1,007,847	429	69	1	
12	16	20	53	637	1,169,311	618	49	18	508	1,008,364	517	101	1	
13	15	23	57	643	1,169,939	628	52	18	542	1,008,910	546	82	1	
14	16	20	56	644	1,170,560	621	51	18	526	1,009,445	535	86	1	
15	56	65	51	703	1,171,199	639	46	17	520	1,009,987	542	97	1	
16	56	65	55	652	1,171,930	731	50	18	529	1,010,604	617	114	1	
17	56	65	60	594	1,172,537	607	55	18	527	1,011,115	511	96	1	
18	15	20	61	604	1,173,053	516	55	18	528	1,011,564	449	67	2	
19	15	20	62	638	1,173,665	612	57	18	529	1,012,094	530	82	2	
20	16	21	64	620	1,174,261	596	59	19	527	1,012,624	530	66	2	
21	16	20	66	611	1,174,852	591	60	19	526	1,013,152	528	63	2	
22	16	20	65	615	1,175,461	609	59	19	529	1,013,698	546	63	2	
23	16	20	65	610	1,176,126	665	60	20	529	1,014,289	591	74	2	
24	56	65	65	629	1,176,712	586	59	20	527	1,014,820	531	55	2	
25	16	20	58	576	1,177,207	495	53	20	513	1,015,273	453	42	3	
26	56	65	53	615	1,177,782	575	48	20	507	1,015,789	516	59	3	
27	15	20	57	596	1,178,355	573	52	20	510	1,016,306	517	56	3	
28	56	65	57	582	1,178,939	584	52	20	510	1,016,820	514	70	3	
29	16	20	53	590	1,179,530	591	49	19	495	1,017,333	513	78	3	
30	16	20	55	585	1,180,186	656	51	19	467	1,017,907	574	82	3	
31	16	20	55	600	1,180,622	436	50	19	496	1,018,266	359	77	3	

Note: The return line to Upper Dumb Bell lake was under repair. Therefor, only physical station use was reported.

August

Month	August	Year	2022	P Page 2 of 4 - PLANT PHYSICAL CHECKS									
	Raw *1		Distribution Loop *2										
	S	TR	Supply				Return					Station Use m³	Duty HL
Day	PSI	PSI	PSI	Flow m³/d	Read m³	Total m³	PSI	0°	Flow m³/d	Read m³	Total m³		
1	56	65	56	577	1,181,224	602	52	19	502	1018797	531	71	3
2	15	20	56	602	1,181,722	498	51	17	487	1019244	447	51	1
3	15	20	61	612	1,182,354	632	55	18	552	1019793	549	83	1
4	56	65	56	600	1,182,967	613	51	18	523	1020314	521	92	1
5	56	65	55	617	1,183,586	619	50	18	506	1020851	537	82	1
6	56	65	57	604	1,184,258	672	52	19	522	1021433	582	90	1
7	15	20	58	600	1,184,849	591	52	19	526	1,021,952	519	72	1
8	15	20	57	625	1,185,349	500	52	19	526	1,022,403	451	49	2
9	15	20	65	621	1,185,967	618	62	19	525	1,022,928	525	93	2
10	15	20	64	635	1,186,601	634	59	18	529	1,023,457	529	105	2
11	15	20	63	634	1,187,239	638	57	18	530	1,023,985	528	110	2
12	8	10	64	629	1,187,874	635	59	18	536	1,024,517	532	103	2
13	15	20	57	696	1,188,653	779	51	18	529	1,025,154	637	142	2
14	56	65	60	646	1,189,253	600	55	18	526	1,025,649	495	105	2
15	15	20	63	642	1,189,784	531	58	18	544	1,026,091	442	89	3
16	15	20	56	593	1,190,387	603	52	18	483	1,026,583	492	111	3
17	8	10	56	586	1,191,022	635	51	18	503	1,027,098	515	120	3
18	14	20	50	622	1,191,617	595	48	18	494	1,027,604	506	89	3
19	13	19	53	611	1,192,230	613	49	18	495	1,028,184	580	33	3
20	13	21	52	652	1,192,757	527	47	18	510	1,028,580	396	131	3
21	13	21	52	596	1,193,367	610	50	18	508	1,029,105	525	85	3
22	12	20	57	570	1,194,024	657	53	18	510	1,029,652	547	110	3
23	10	16	58	665	1,194,576	552	53	18	516	1,030,121	469	83	1
24	12	17	55	682	1,195,189	613	50	18	528	1,030,637	516	97	1
25	55	65	54	708	1,195,808	619	50	18	523	1,031,163	526	93	1
26	12	18	59	641	1,196,496	688	50	18	540	1,031,753	590	98	1
27	11	15	61	604	1,197,039	543	55	18	523	1,032,211	458	85	1
28	11	19	60	626	1,197,654	615	55	18	534	1,032,762	551	64	1
29	56	64	59	627	1,198,254	600	54	18	523	1,033,273	511	89	1
30	56	64	69	603	1,198,868	614	63	18	533	1,033,807	534	80	2
31	13	18	64	633	1,199,482	614	60	18	526	1,034,336	529	85	2

September

Month	September	Year	2022		P Page 2 of 4 - PLANT PHYSICAL CHECKS									
	Raw *1		Distribution Loop *2											
	S	TR	Supply				Return					Station Use m³	Duty HL	
Day	PSI	PSI	PSI	Flow m³/d	Read m³	Total m³	PSI	0°	Flow m³/d	Read m³	Total m³			
1	13	20	66	612	1,200,137	655	61	18	524	1034894	558	97	2	
2	9	11	62	644	1,200,723	586	58	18	536	1035390	496	90	2	
3	10	11	66	632	1,201,330	607	60	17	524	1035915	525	82	2	
4	8	11	66	630	1,201,955	625	59	17	525	1036450	535	90	2	
5	9	12	65	640	1,202,593	638	59	17	524	1037008	558	80	3	
6	9	15	57	596	1,203,139	546	52	17	500	1037485	477	69	3	
7	9	16	57	590	1,203,759	620	52	17	504	1,038,016	531	89	3	
8	9	16	54	616	1,204,348	589	49	17	496	1,038,524	508	81	3	
9	9	16	55	599	1,204,927	579	50	17	491	1,039,011	487	92	3	
10	9	12	55	597	1,205,510	583	51	17	514	1,039,510	499	84	3	
11	9	15	54	610	1,206,072	562	49	17	515	1,040,005	495	67	3	
12	9	16	59	611	1,206,710	638	53	17	536	1,040,562	557	81	1	
13	9	12	61	594	1,207,323	613	57	17	528	1,041,095	533	80	1	
14	10	10	59	664	1,207,881	558	55	17	524	1,041,586	491	67	1	
15	10	15	60	621	1,208,494	613	54	17	525	1,042,120	534	79	1	
16	11	15	60	600	1,209,137	643	55	16	528	1,042,681	561	82	1	
17	13	18	58	615	1,209,686	549	52	17	525	1,043,170	489	60	1	
18	8	14	61	604	1,210,262	576	56	16	523	1,043,676	506	70	1	
19	14	18	67	656	1,210,881	619	62	16	526	1,044,221	545	74	2	
20	9	14	67	596	1,211,487	606	62	16	524	1,044,752	531	75	2	
21	11	15	65	613	1,212,129	642	60	16	526	1,045,310	558	84	2	
22	11	18	67	612	1,212,708	579	62	17	525	1,045,822	512	67	2	
23	14	20	7	628	1,213,336	628	63	16	529	1,046,373	551	77	2	
24	13	18	64	637	1,213,836	500	59	17	525	1,046,814	441	59	2	
25	12	18	69	594	1,214,447	611	65	17	525	1,047,354	540	71	2	
26	10	19	55	587	1,215,130	683	50	17	503	1,047,943	589	94	3	
27	10	16	55	598	1,215,721	591	51	16	494	1,048,450	507	84	3	
28	7	11	55	597	1,216,252	531	50	16	496	1,048,915	465	66	3	
29	8	13	54	609	1,216,852	600	50	15	502	1,049,434	519	81	3	
30	7	11	55	576	1,217,396	544	50	16	498	1,049,914	480	64	3	

October

Month	Oct.	Year	2022		P Page 2 of 4 - PLANT PHYSICAL CHECKS									
	Raw *1		Distribution Loop *2											
	S	TR	Supply				Return					Station Use m³	Duty HL	
Day	PSI	PSI	PSI	Flow m³/d	Read m³	Total m³	PSI	0°	Flow m³/d	Read m³	Total m³			
1	10	8	55	592	1,217,980	584	50	16	498	1050433	519	65	3	
2	9	16	53	608	1,218,593	613	48	15	492	1050960	527	86	3	
3	10	15	58	651	1,219,177	584	54	15	527	1051459	499	85	1	
4	12	18	56	643	1,219,776	599	50	15	527	1051980	521	78	1	
5	12	15	61	606	1,220,403	627	55	15	525	1052522	542	85	1	
6	13	15	61	613	1,220,993	590	56	15	530	1053035	513	77	1	
7	13	15	59	622	1,221,596	603	53	12	526	1,053,465	430	173	1	
8	14	18	58	649	1,222,214	618	53	12	522	1,053,982	517	101	1	
9	13	18	58	636	1,222,841	627	53	13	524	1,054,513	531	96	1	
10	14	15	58	640	1,223,450	609	52	13	524	1,055,021	508	101	2	
11	13	20	66	623	1,224,132	682	61	13	528	1,055,579	558	124	2	
12	13	15	69	598	1,224,742	610	63	13	523	1,056,085	506	104	2	
13	56	62	67	622	1,225,355	613	61	14	525	1,056,593	508	105	2	
14	56	62	64	645	1,225,994	639	59	14	524	1,057,121	528	111	2	
15	15	20	64	666	1,226,699	705	56	14	525	1,057,706	585	120	2	
16	15	20	65	638	1,227,364	665	59	14	524	1,058,256	550	115	2	
17	15	20	65	638	1,227,868	504	60	15	527	1,058,689	433	71	3	
18	12	16	56	579	1,228,451	583	52	14	474	1,059,183	494	89	3	
19	12	16	54	587	1,229,039	588	50	15	472	1,059,683	500	88	3	
20	12	16	53	607	1,229,621	582	48	16	476	1,060,177	494	88	3	
21	12	16	56	573	1,230,222	601	52	16	474	1,060,684	507	94	3	
22	11	16	52	621	1,230,872	650	49	16	475	1,061,234	550	100	3	
23	10	16	55	576	1,231,382	510	51	16	470	1,061,671	437	73	3	
24	56	62	55	582	1,231,938	556	51	16	469	1,062,143	472	84	3	
25	12	16	55	632	1,232,542	604	50	16	516	1,062,661	518	86	1	
26	12	16	56	622	1,233,152	610	51	15	507	1,063,178	517	93	1	
27	12	16	55	625	1,233,758	606	51	15	515	1,063,698	520	86	1	
28	12	16	57	616	1,234,377	619	51	15	525	1,064,228	530	89	1	
29					1,234,377	0				1,064,228	0	0		
30	56	60	57	611	1,235,698	1321	52	146	495	1,065,346	1118	203	1	
31	56	60	56	628	1,236,204	506	51	142	506	1,065,767	421	85	1	

Note: The computer metering system was offline due to unforeseen circumstances on October 29th and October 30th data is reprehensive of two days worth of usage and thus not above 875m3 daily limit.

November

Month	NOV	Year	2022		P Page 2 of 4 - PLANT PHYSICAL CHECKS									
	Raw *1		Distribution Loop *2											
	S	TR	Supply				Return							
Day	PSI	PSI	PSI	Flow m³/d	Read m³	Total m³	PSI	0°	Flow m³/d	Read m³	Total m³	Sation Use m3	Duty HL	
1	56	60	64	626	1,236,818	614	59	14	527	1066297	529	85	2	
2	16	20	61	660	1,237,451	633	56	14	523	1066827	530	103	2	
3	16	20	62	642	1,238,065	614	51	14	526	1067350	523	91	2	
4	16	20	62	658	1,238,714	649	57	13	526	1067885	535	114	2	
5	56	60	66	658	1,239,415	701	64	13	523	1068495	610	91	2	
6	56	60	61	650	1,240,054	639	55	13	524	1069066	571	68	2	
7	56	60	64	629	1,240,562	508	59	13	524	1,069,472	406	102	2	
8	56	60	55	588	1,241,150	588	50	13	474	1,069,970	498	90	3	
9	56	60	56	584	1,241,733	583	51	13	503	1,070,473	503	80	3	
10	56	60	56	590	1,242,332	599	50	14	505	1,070,993	520	79	3	
11	56	60	56	581	1,243,008	676	50	15	506	1,071,578	585	91	3	
12	56	60	55	590	1,243,561	553	51	15	492	1,072,062	484	69	3	
13	10	16	56	564	1,244,154	593	51	15	490	1,072,580	518	75	3	
14	56	60	53	601	1,244,637	483	49	15	510	1,073,003	423	60	1	
15	12	16	53	621	1,245,230	593	48	15	519	1,073,518	515	78	1	
16	12	16	55	612	1,245,828	598	49	15	521	1,074,039	521	77	1	
17	12	16	57	592	1,246,438	610	52	15	520	1,074,569	530	80	1	
18	56	60	54	616	1,247,041	603	50	14	493	1,075,082	513	90	1	
19	56	60	59	610	1,247,736	695	54	14	527	1,075,681	599	96	1	
20	56	60	58	628	1,248,328	592	53	14	525	1,076,197	516	76	1	
21	16	20	57	633	1,248,854	526	52	14	518	1,076,644	447	79	2	
22	16	20	65	619	1,249,465	611	51	14	526	1,077,175	531	80	2	
23	16	20	57	668	1,250,067	602	51	14	518	1,077,697	522	80	2	
24	56	60	60	637	1,250,677	610	55	13	524	1,078,224	527	83	2	
25	56	60	59	655	1,251,299	622	54	14	524	1,078,764	540	82	2	
26	14	20	65	611	1,251,995	696	59	14	503	1,079,360	596	100	2	
27	14	20	55	679	1,252,597	602	50	14	522	1,079,883	523	79	2	
28	14	20	65	626	1,253,144	547	60	13	524	1,080,355	472	75	3	
29	12	20	56	574	1,253,697	553	52	14	478	1,080,829	474	79	3	
30	12	20	55	592	1,254,276	579	20	14	505	1,081,324	495	84	3	
31	12	20	55	594	1,254,866	590	51	13	474	1,081,818	494	96	3	

December

Month	Dec	Year	2022		P Page 2 of 4 - PLANT PHYSICAL CHECKS									
	Raw *1		Distribution Loop *2											
	S	TR	Supply				Return					Station Use m³	Duty HL	
Day	PSI	PSI	PSI	Flow m³/d	Read m³	Total m³	PSI	0°F	Flow m³/d	Read m³	Total m³			
1	12	20	55	594	1,254,866	590	51	13	474	1,081,818	494	96	2	
2	12	20	55	597	1,255,483	617	50	13	477	1,082,333	515	102	2	
3	12	20	55	585	1,256,102	619	51	13	473	1,082,773	440	179	2	
4	12	20	55	578	1,256,741	639	51	13	477	1,083,336	563	76	2	
5	16	20	55	608	1,257,220	479	49	13	489	1,083,742	406	73	1	
6	10	20	54	591	1,257,800	580	50	13	468	1,084,232	490	90	1	
7	16	20	58	620	1,258,396	596	51	13	519	1,084,742	510	86	1	
8	16	20	58	610	1,259,074	678	53	14	513	1,085,320	578	100	1	
9	STORM				1,259,692	618			500	1,085,820	500	118		
10	18	20	59	621	1,260,272	580	52	17	524	1,086,341	521	59	1	
11	12	20	56	614	1,260,921	649	51	14	515	1,086,900	559	90	1	
12	14	20	56	631	1,261,480	559	51	18	522	1,087,367	467	92	2	
13	14	20	62	636	1,262,111	631	58	14	526	1,087,903	536	95	2	
14	14	20	54	633	1,262,791	680	59	14	526	1,088,477	574	106	2	
15	16	52	65	632	1,263,342	551	59	15	526	1,088,945	468	83	2	
16	15	20	66	622	1,264,029	687	60	13	524	1,089,525	580	107	2	
17	14	20	62	638	1,264,637	608	57	14	523	1,090,039	514	94	2	
18	16	55	67	617	1,265,210	573	62	13	523	1,090,525	486	87	2	
19	18	55	63	626	1,265,825	615	59	14	524	1,091,046	521	94	3	
20	18	55	50	299	1,266,128	303	47	13	219	1,091,250	204	99	3	
21	15	55	50	342	1,266,460	332	47	14	179	1,091,486	236	96	3	
22	15	55	48	341	1,266,761	301	50	14	171	1,091,698	212	89	3	
23	15	52	47	351	1,267,053	292	48	14	253	1,091,900	202	90	3	
24	9	18	50	285	1,267,345	292	48	14	135	1,092,119	219	73	3	
25	9	14	49	287	1,267,651	306	49	14	102	1,092,344	225	81	3	
26	10	18	51	313	1,267,938	287	50	15	248	1,092,548	204	83	1	
27	10	16	51	379	1,268,354	416	47	15	207	1,092,888	340	76	1	
28	10	16	52	360	1,268,739	385	49	15	336	1,093,186	298	87	1	
29	13	17	51	377	1,269,140	401	49	15	291	1,093,502	316	85	1	
30	12	18	49	389	1,269,526	386	46	15	272	1,093,795	293	93	1	
31	12	20	50	613	1,270,062	536	47	15	495	1,094,256	461	75	1	

Note: A storm interrupted the data capturing on December 9th.

Appendix B

Monitoring Program Station No. ALT-2 & ALT 3

Year: 2022

Month: June, July and August

ALT-2 Name: Sewage Terrace Outfall Point

ALT-3 Name: Sewage Terrace Final Discharge Point

Description: Effluent Quality Results.

Notes:

The Alert Sewage Terrace System is being monitored by Nasittuq Corporation, under service contract by DND and administrated by 8 Wing Trenton Environmental Management in Trenton, Ontario. Water quality samples are collected and analyzed by ALS Canada Ltd., Ontario.

Summary of Results:

ALT-2 is located at the Sewage Terrace Outfall Point.

ALT-3 is located at the Sewage Terrace Final Discharge Point (Parr Inlet).

In reference to **Part E, Item 4**, for ALT-3 and /or Alt 13, the results are summarized:

Jun-22						
		29-Jun-22	29-Jun-22	30-Jun-22	30-Jun-22	
	Licence Specific Criteria	Alt-2	Alt-3	Alt-2	Alt-3	
Benzene (ug/L)	370	NA	NA	NA	NA	
Toluene (ug/L)	2	NA	NA	NA	NA	
Ethylbenzene (ug/L)	90	NA	NA	NA	NA	
Lead (ug/L)	1	2.91	4.62	2.74	1.38	
Oil and Grease (mg/L)	15 (NVS)	ND	ND	ND	ND	
Phenols (ug/L)	20	20.4	3.1	20.1	5.7	
BOD ₅ (mg/L)	80	Not Sampled	ND	Not Sampled	6.3	
pH		7.52	10	7.45	7.59	
TSS (mg/L)	70	9.1	3.1	6.7	10.1	
Oil and Grease (mg/L)	5 (NVS)	ND	ND	ND	ND	
	CCME Criteria (marine)					
pH	7.0 to 8.7	7.52	10	7.45	7.59	
Conductivity	---	689	622	676	470	
Temperature (field)	---					
TSS (mg/L)	---	9.1	3.1	6.7	10.1	
Oil and Grease (mg/L)	---	ND	ND	ND	ND	
Nitrate-Nitrite (mg/L)	---	ND	ND	ND	0.048	
Ammonia Nitrogen (mg/L)	---	8.37	0.188	9.87	5.52	
Sulphate (mg/L)	---	15.9	13.7	15.2	6.17	
Total Hardness (mg/L)	---	173	111	178	134	
Total Alkalinity (mg/L)	---	237	145	229	163	
Total Phenols (mg/L)	---	0.0204	0.0031	0.0201	0.0057	
TOC (mg/L)	---	46	23.2	41.8	19.3	
Fecal Coliforms (CFU/100mL)	---	Not Sampled	ND	Not Sampled	14	
Aluminum (mg/L)	---	0.0366	0.0286	0.0623	0.0478	
Antimony (mg/L)	0.5	NA	NA	NA	NA	
Arsenic (mg/L)	0.0125	0.0116	0.0112	0.00974	0.00303	
Cadmium (mg/L)	0.12	0.000123	0.000118	0.0000963	0.000117	
Calcium (mg/L)	---	44.9	19.1	46.3	42.5	
Chromium (mg/L)	---	ND	ND	ND	ND	
Copper (mg/L)	0.002	0.0584	0.0295	0.0657	0.0316	
Iron (mg/L)	---	1.64	0.762	1.48	0.417	
Lead (mg/L)	0.002	0.00291	0.00462	0.00274	0.00138	
Magnesium (mg/L)	---	14.7	15.4	15.1	6.87	
Mercury (mg/L)	0.00016	0.000006	ND	ND	ND	
Nickle (mg/L)	0.0083	0.0358	0.0369	0.0395	0.0092	
Potassium (mg/L)	---	12.6	16	12.6	5.71	
Silver (mg/L)	---	0.000023	0.000062	0.000017	0.000013	
Sodium (mg/L)	---	54.4	79.6	51.8	29.8	
Zinc (mg/L)	0.01	0.01	0.0128	0.0255	0.0262	
BOD ₅ (mg/L)	---	Not Sampled	ND	Not Sampled	6.3	
Chloride (mg/L)	---	64.8	98.6	60.7	41.4	
Benzene (ug/L)	110	NA	NA	NA	NA	
Ethylbenzene (ug/L)	25	NA	NA	NA	NA	
Toluene (ug/L)	215	NA	NA	NA	NA	
Xylenes (ug/L)	---	NA	NA	NA	NA	
F1 (ug/L)	---	NA	NA	NA	NA	
F2 (ug/L)	---	NA	NA	NA	NA	
F3 (ug/L)	---	NA	NA	NA	NA	
F4 (ug/L)	---	NA	NA	NA	NA	
Acenaphthene (ug/L)	---	NA	NA	NA	NA	
Acenaphthylene (ug/L)	---	NA	NA	NA	NA	
Acridine (ug/L)	---	NA	NA	NA	NA	
Benzo(a)anthracene (ug/L)	---	NA	NA	NA	NA	
Benzo(o)pyrene (ug/L)	---	NA	NA	NA	NA	
Benzo(b)fluoranthene (ug/L)	---	NA	NA	NA	NA	
Benzo(g,h,i)perylene (ug/L)	---	NA	NA	NA	NA	
Benzo(k)fluoranthene (ug/L)	---	NA	NA	NA	NA	
Chrysene (ug/L)	---	NA	NA	NA	NA	
Dibenzo(ah)anthracene (ug/L)	---	NA	NA	NA	NA	
Fluoranthene (ug/L)	---	NA	NA	NA	NA	
Fluorene (ug/L)	---	NA	NA	NA	NA	
Indeno(1,2,3-cd)pyrene (ug/L)	---	NA	NA	NA	NA	
1+2-Methylnaphthalenes (ug/L)	---	NA	NA	NA	NA	
1-Methylnaphthalene (ug/L)	---	NA	NA	NA	NA	
2-Methylnaphthalene (ug/L)	---	NA	NA	NA	NA	
Napthalene (ug/L)	1.4	NA	NA	NA	NA	
Phenanthrene (ug/L)	---	NA	NA	NA	NA	
Pyrene (ug/L)	---	NA	NA	NA	NA	
Quinoline (ug/L)	---	NA	NA	NA	NA	

Jul-22													
	Licence Specific Criteria	Alt-2	Alt-3	Alt-2	Alt-3	Alt-2	Alt-3	Alt-2	Alt-3	Alt-2	Alt-3	Alt-2	Alt-3
Benzene (ug/L)	370	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene (ug/L)	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene (ug/L)	90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (ug/L)	1	8.35	1.45	3.49	1.35	3.58	1.94	1.14	5.7	0.973	8.15		
Oil and Grease (mg/L)	15 (NVS)	ND	ND	ND	ND	ND	ND	17.7	15.9	21.2	ND		
Phenols (ug/L)	20	19	3.3	10.5	0.37	0.91	0.37	39.2	13.4	0.0369	0.0071		
BOD ₅ (mg/L)	80	ND	5.3	ND	5.8	ND	5.2	69.6	11.6	172	5.7		
pH		7.61	7.82	7.74	7.6	7.88	8	7.34	7.6	7.46	8.04		
TSS (mg/L)	70	ND	ND	ND	3.7	3.9	7.3	87.4	178	64.4	9.6		
Oil and Grease (mg/L)	5 (NVS)	ND	ND	ND	ND	ND	ND	17.7	15.9				
	CCME Criteria (marine)												
pH	7.0 to 8.7	7.61	7.82	7.74	7.6	7.88	8	7.34	7.6	7.46	8.04		
Conductivity	---	740	484	723	510	811	1060	896	682	515	813		
Temperature (field)	---												
TSS (mg/L)	---	ND	ND	ND	3.7	3.9	7.3	87.4	178	64.4	9.6		
Oil and Grease (mg/L)	---	ND	ND	ND	ND	ND	ND	17.7	15.9				
Nitrate-Nitrite (mg/L)	---	0.088	0.046	ND	0.051	ND	0.468	ND	0.46	ND	0.068		
Ammonia Nitrogen (mg/L)	---	7.7	5.97	5.86	4.58	5.23	3.06	11.9	5.72	14	3.66		
Sulphate (mg/L)	---	18.9	5.95	24.8	5.73	26	25.2	4.54	28.7	4.01	13.8		
Total Hardness (mg/L)	---	200	156	226	152	225	216	129	220	121	240		
Total Alkalinity (mg/L)	---	266	173	302	180	302	189	220	188	187	240		
Total Phenols (mg/L)	---	0.019	0.0033	0.0105	0.0037	0.0091	0.0037	0.0392	13.4	---	---		
TOC (mg/L)	---	31	18.7	22.4	20.4	23	17	41.9	29.9	59.9	17		
Fecal Coliforms (CFU/100mL)	---	ND	10	ND	12	ND	ND	NA	1000	ND	670		
Aluminum (mg/L)	---	0.019	0.0647	0.0132	0.0263	0.0117	0.0545	0.126	2.97	0.0972	0.0168		
Antimony (mg/L)	0.5	NA	NA	NA	NA	NA	NA	ND	ND	---	---		
Arsenic (mg/L)	0.0125	0.0116	0.00277	0.012	0.00294	0.0115	0.0288	0.00205	0.00705	0.00139	0.00453		
Barium (mg/L)		NA	NA	NA	NA	NA	NA	0.0083	0.00119	---	---		
Beryllium (mg/L)		NA	NA	NA	NA	NA	NA	ND	ND	---	---		
Bismuth (mg/L)		NA	NA	NA	NA	NA	NA	ND	ND	---	---		
Boron (mg/L)		NA	NA	NA	NA	NA	NA	ND	0.16	---	---		
Cadmium (mg/L)	0.12	0.000709	0.000134	0.000075	0.000138	0.0000716	0.000218	0.0000802	0.000127	0.000122	0.0000901		
Calcium (mg/L)	---	51.7	48.9	57	47.4	51.5	56.2	61	38.1	64.6			
Chromium (mg/L)	---	ND	ND	ND	ND	ND	ND	ND	0.0056	0.00072	ND		
Cobalt (mg/L)		NA	NA	NA	NA	NA	NA	0.00439	0.0126	---	---		
Copper (mg/L)	0.002	0.0297	0.0245	0.0234	0.0258	0.0212	0.0329	0.0589	0.0574	0.123	0.0194		
Iron (mg/L)	---	1.85	0.568	1.69	0.0425	1.74	0.636	0.0226	0.0635	1.6	2.13		
Lead (mg/L)	0.002	0.0203	0.00145	0.02049	0.00135	0.02052	0.00194	0.00114	0.0057	0.973	1.15		
Lithium (mg/L)		NA	NA	NA	NA	NA	NA	ND	ND	---	---		
Magnesium (mg/L)	---	17.2	8.22	20.4	8.21	20.6	21.2	0.0623	0.164	6.4	19.1		
Manganese (mg/L)		NA	NA	NA	NA	NA	NA	0.00106	0.00396	---	---		
Mercury (mg/L)	0.00016	ND	ND	ND	ND	ND	ND	0.0000059	0.00001	0.0000051	ND		
Molybdenum (mg/L)		NA	NA	NA	NA	NA	NA	ND	0.00174	---	---		
Nickel (mg/L)	0.0083	0.0458	0.0104	0.0461	0.0107	0.0449	0.0128	0.00942	0.028	0.0062	0.0176		
Phosphorus (mg/L)		NA	NA	NA	NA	NA	NA	1.99	1.48	---	---		
Potassium (mg/L)	---	13.2	5.57	14.4	5.01	14.6	10.2	8.05	8.08	12.2	6.26		
Selenium (mg/L)		NA	NA	NA	NA	NA	NA	ND	ND	---	---		
Silicon (mg/L)		NA	NA	NA	NA	NA	NA	1.09	4.64	---	---		
Silver (mg/L)		0.000022	0.000011	0.000016	ND	0.00146	0.00232	ND	ND	0.000023	ND		
Sodium (mg/L)	---	59.1	34.3	69.8	34.8	72.1	11.2	97.7	66	35.4	70.8		
Stontonium (mg/L)		NA	NA	NA	NA	NA	NA	0.0826	0.146	---	---		
Sulfur (mg/L)		NA	NA	NA	NA	NA	NA	ND	8.169	---	---		
Thallium (mg/L)		NA	NA	NA	NA	NA	NA	ND	ND	---	---		
Tin		NA	NA	NA	NA	NA	NA	ND	ND	---	---		
Titanium (mg/L)		NA	NA	NA	NA	NA	NA	ND	ND	---	---		
Uranium (mg/L)		NA	NA	NA	NA	NA	NA	0.000245	0.0013	---	---		
Vanadium (mg/L)		NA	NA	NA	NA	NA	NA	ND	ND	---	---		
Zinc (mg/L)	0.01	0.0149	0.0232	0.0134	0.0223	0.0146	0.0232	ND	0.0343	0.0407	0.0109		
BOD ₅ (mg/L)	---	ND	5.3	ND	5.8	ND	5.2	69.6	11.6	172	5.7		
Chloride (mg/L)	---	64	43.7	67.7	48.8	66.4	206	142	71	44.8	111		
Benzene (ug/L)	110	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Ethylbenzene (ug/L)	25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Toluene (ug/L)	215	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Xylenes (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
F1 (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
F2 (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
F3 (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
F4 (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Acenaphthene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Acenaphthylene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Acridine (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Benzo(a)anthracene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Benzo(o)pyrene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Benzo(b)fluoranthene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Benzo(g,h,i)perylene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Benzo(k)fluoranthene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Chrysene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Dibenzo(ah)anthracene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Fluoranthene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Fluorene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Indeno(1,2,3-cd)pyrene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
1+2-Methylnaphthalenes (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
1-Methylnaphthalene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
2-Methylnaphthalene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Naphthalene (ug/L)	1.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Phenanthrene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Pyrene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Quinoline (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		

Aug-22		10-Aug	10-Aug	16-Aug	16-Aug	23-Aug	23-Aug	24-Aug	24-Aug	27-Aug	27-Aug	29-Aug	29-Aug
	Licence Specific Criteria	Alt-2	Alt-3	Alt-2	Alt-3	Alt-2	Alt-3	Alt-2	Alt-3	Alt-2	Alt-3	Alt-2	Alt-3
Benzene (ug/L)	370	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene (ug/L)	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene (ug/L)	90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (ug/L)	1	0.937	2.9	1.38	2.12	0.936	4.31	1.79	1.31	1.12	1.48	8.45	2.42
Oil and Grease (mg/L)	15 (NVS)	10.5	5.6	12.5	ND	20.1	17.5	26.2	ND	13.8	ND	238	21.6
Phenols (ug/L)	20	22.6	21.6	0.0163	0.0123	0.0172	0.0164	0.0212	0.0108	0.0321	0.031	0.0247	0.0203
BOD ₅ (mg/L)	80	53.2	20	48.4	23	32.5	78.5	179	11.9	40.7	62.1	1020	97.2
pH		7.88	8.12	7.4	7.53	7.42	7.21	7.37	8.19	7.66	7.56	6.89	7.52
TSS (mg/L)	70	63	76.8	60.8	25	18.8	204	93	18.6	25.4	34.4	794	133
Oil and Grease (mg/L)	5 (NVS)	10.5	5.6	12.5	ND	20.1	17.5	26.2	ND	13.8	ND	238	21.6
	CCME Criteria (marine)												
pH	7.0 to 8.7	7.88	8.12	7.4	7.53	7.42	7.21	7.37	8.19	7.66	7.56	6.89	7.52
Conductivity	---	487	641	375	696	479	475	567	835	569	631	388	558
Temperature (field)	---												
TSS (mg/L)	---	63	76.8	60.8	25	18.8	204	93	18.6	25.4	34.4	794	133
Oil and Grease (mg/L)	---	10.5	5.6	12.5	ND	20.1	17.5	26.2	ND	13.8	ND	238	21.6
Nitrate-Nitrite (mg/L)	---	ND	ND	0.023	0.368	ND	ND	ND	ND	ND	ND	0.051	ND
Ammonia Nitrogen (mg/L)	---	12.2	11.5	5.88	6.56	9.77	11.3	8.3	7.96	16.8	17.6	5.48	9.72
Sulphate (mg/L)	---	6.77	7.89	4.32	8.88	5.33	3.56	13	6.81	7.34	8.07	ND	4.82
Total Hardness (mg/L)	---	113	161	120	172	118	169	150	267	132	155	150	149
Aluminium (mg/L)	---	176	214	138	203	161	174	187	332	191	229	170	182
Total Phenols (mg/L)	---	0.0226	0.0216	0.0163	0.0123	0.0172	0.0164	0.0212	0.0108	0.0321	0.031	0.0247	0.0203
TOC (mg/L)	---	31.4	28.6	30.2	30.8	31.4	55	96.7	27.5	50.2	58.3	256	61.2
Fecal Coliforms (CFU/100mL)	---	ND	96000	8200000	470000	18000	157000	340000	0	81000	340000	8300000	440000
Antimony (mg/L)	0.5	0.0695	1.09	0.104	0.114	0.121	1.67	0.233	0.0228	0.113	0.0916	1.16	0.815
Arsenic (mg/L)	0.0125	0.00077	0.00834	0.00069	0.0052	0.00108	0.0057	0.00394	0.00732	0.00106	0.00358	0.00177	0.00322
Barium (mg/L)													
Beryllium (mg/L)													
Bismuth (mg/L)													
Boron (mg/L)													
Cadmium (mg/L)	0.12	0.00062	0.000102	0.0000543	0.0000942	0.0000645	0.000125	0.000153	0.0000079	0.000051	0.0000827	0.000397	0.0000856
Calcium (mg/L)	---	35.7	48.3	38.1	51.9	37.4	52.1	45.6	81.5	42.1	48	47.5	45.7
Chromium (mg/L)	---	ND	0.00246	0.00057	ND	ND	ND	0.00097	ND	0.00064	0.00059	0.00431	0.00201
Cobalt (mg/L)													
Copper (mg/L)	0.002	0.127	0.078	0.146	0.0604	0.101	0.168	0.0909	0.00359	0.149	0.0929	0.577	0.143
Iron (mg/L)		0.78	3.79	0.726	2.2	0.583	5.06	2.3	6.48	0.951	2.86	2.15	3.45
Lead (mg/L)	0.002	0.000937	0.0029	0.00138	0.00212	0.000936	0.00431	0.00179	0.00131	0.00112	0.00148	0.00845	0.00742
Lithium (mg/L)													
Magnesium (mg/L)	---	5.86	9.87	6.08	10.3	6.1	9.56	8.69	15.5	6.59	8.62	7.7	8.42
Manganese (mg/L)													
Mercury (mg/L)	0.00016	0.0000053	0.0000059	ND	ND	ND	0.0000051	ND	ND	ND	ND	0.0000202	0.0000053
Molybdenum (mg/L)													
Nickel (mg/L)	0.0083	0.00269	0.0183	0.0024	0.0145	ND	0.012	0.00693	0.0478	0.00338	0.00889	0.00554	0.00812
Phosphorus (mg/L)													
Potassium (mg/L)	---	10.1	10.5	4.94	8.98	6.56	6.93	9.24	10.8	7.47	9.8	4.93	7.26
Selenium (mg/L)													
Silicon (mg/L)													
Silver (mg/L)		0.000024	0.000033	0.000022	0.000012	ND	ND	0.000018	ND	0.000096	0.000015	0.000198	0.000062
Sodium (mg/L)	---	17.5	42.1	19.1	59.6	33.6	24.5	48.1	68.4	38.8	38.8	18.2	42.9
Stontonium (mg/L)													
Sulfur (mg/L)													
Thallium (mg/L)													
Tin													
Titanium (mg/L)													
Uranium (mg/L)													
Vanadium (mg/L)													
Zinc (mg/L)	0.01	0.032	0.0216	0.0424	0.0405	ND	0.0902	0.0589	0.0044	0.0279	0.0417	0.156	0.0687
BOD ₅ (mg/L)	---	53.2	20	48.4	23	32.5	78.5	179	11.9	40.7	62.1	1020	97.2
Chloride (mg/L)	---			23.4	84.4	40.5	29.5	56.8	64.7	48.8	46.6	23.5	56.6
Benzene (ug/L)	110	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene (ug/L)	25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene (ug/L)	215	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1 (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F2 (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F3 (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F4 (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acridine (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(o)pyrene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(ah)anthracene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1+2-Methylnaphthalenes (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Methylnaphthalene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Napthalene (ug/L)	1.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Quinoline (ug/L)	---	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Sep-22								
		15-Sep	15-Sep	05-Sep	05-Sep	06-Sep	06-Sep	
	Licence Specific Criteria	Alt-2	Alt-3	Alt-2	Alt-3	Alt-2	Alt-3	
Benzene (ug/L)	370	NA	NA	NA	NA	NA	NA	
Toluene (ug/L)	2	NA	NA	NA	NA	NA	NA	
Ethylbenzene (ug/L)	90	NA	NA	NA	NA	NA	NA	
Lead (ug/L)	1	1.14	5.7	0.973	1.15	0.973	1.15	
Oil and Grease (mg/L)	15 (NVS)	17.7	15.9	21.2	ND	21.2	ND	
Phenols (ug/L)	20	39.2	13.4	0.0369	0.0071	0.0369	0.0071	
BOD ₅ (mg/L)	80	69.6	11.6	172	5.7	172	5.7	
pH		7.34	7.6	7.46	8.04	7.46	8.04	
TSS (mg/L)	70	87.4	178	64.4	9.6	64.4	9.6	
Oil and Grease (mg/L)	5 (NVS)	17.7	15.9					
	CCME Criteria (marine)							
pH	7.0 to 8.7	7.34	7.6	7.46	8.04	7.46	8.04	
Conductivity	---	896	682	515	813	515	813	
Temperature (field)	---							
TSS (mg/L)	---	87.4	178	64.4	9.6	64.4	9.6	
Oil and Grease (mg/L)	---	17.7	15.9					
Nitrate-Nitrite (mg/L)	---	ND	0.46	ND	0.068	ND	0.068	
Ammonia Nitrogen (mg/L)	---	11.9	5.72	14	3.66	14	3.66	
Sulphate (mg/L)	---	4.54	28.7	4.01	13.8	4.01	13.8	
Total Hardness (mg/L)	---	129	220	121	240	121	240	
Total Alkalinity (mg/L)	---	220	188	187	240	187	240	
Total Phenols (mg/L)	---	0.0392	13.4	---	---	---	---	
TOC (mg/L)	---	41.9	29.9	59.9	17	59.9	17	
Fecal Coliforms (CFU/100mL)	---	NA	1000	ND	670	ND	670	
Aluminum (mg/L)	---	0.126	2.97	0.0972	0.0168	0.0972	0.0168	
Antimony (mg/L)	0.5	ND	ND	---	---	---	---	
Arsenic (mg/L)	0.0125	0.00205	0.00705	0.00139	0.00453	0.00139	0.00453	
Barium (mg/L)	---	0.0083	0.00119	---	---	---	---	
Beryllium (mg/L)	---	ND	ND	---	---	---	---	
Bismuth (mg/L)	---	ND	ND	---	---	---	---	
Boron (mg/L)	---	ND	0.16	---	---	---	---	
Cadmium (mg/L)	0.12	0.0000802	0.000127	0.000122	0.0000901	0.000122	0.0000901	
Calcium (mg/L)	---	41.4	61	38.1	64.6	38.1	64.6	
Chromium (mg/L)	---	ND	0.0056	0.00072	ND	0.00072	ND	
Cobalt (mg/L)	---	0.00439	0.0126	---	---	---	---	
Copper (mg/L)	0.002	0.0089	0.0574	0.123	0.0194	0.123	0.0194	
Iron (mg/L)	---	0.0226	0.0635	1.6	2.13	1.6	2.13	
Lead (mg/L)	0.002	0.00114	0.0057	0.973	1.15	0.973	1.15	
Lithium (mg/L)	---	ND	ND	---	---	---	---	
Magnesium (mg/L)	---	0.0623	0.164	6.4	19.1	6.4	19.1	
Manganese (mg/L)	---	0.00106	0.00396	---	---	---	---	
Mercury (mg/L)	0.00016	0.0000059	0.00001	0.0000051	ND	0.0000051	ND	
Molybdenum (mg/L)	---	ND	0.00174	---	---	---	---	
Nickel (mg/L)	0.0083	0.00942	0.028	0.0062	0.0176	0.0062	0.0176	
Phosphorus (mg/L)	---	1.99	1.48	---	---	---	---	
Potassium (mg/L)	---	8.05	8.08	12.2	6.26	12.2	6.26	
Selenium (mg/L)	---	ND	ND	---	---	---	---	
Silicon (mg/L)	---	1.09	4.64	---	---	---	---	
Silver (mg/L)	---	ND	ND	0.000023	ND	0.000023	ND	
Sodium (mg/L)	---	97.7	66	35.4	70.8	35.4	70.8	
Stontonium (mg/L)	---	0.0826	0.146	---	---	---	---	
Sulfur (mg/L)	---	ND	8.169	---	---	---	---	
Thallium (mg/L)	---	ND	ND	---	---	---	---	
Tin	---	ND	ND	---	---	---	---	
Titanium (mg/L)	---	ND	ND	---	---	---	---	
Uranium (mg/L)	---	0.000245	0.0013	---	---	---	---	
Vanadium (mg/L)	---	ND	ND	---	---	---	---	
Zinc (mg/L)	0.01	ND	0.0343	0.0407	0.0109	0.0407	0.0109	
BOD ₅ (mg/L)	---	69.6	11.6	172	5.7	172	5.7	
Chloride (mg/L)	---	142	71	44.8	111	44.8	111	
Benzene (ug/L)	110	NA	NA	NA	NA	NA	NA	
Ethylbenzene (ug/L)	25	NA	NA	NA	NA	NA	NA	
Toluene (ug/L)	215	NA	NA	NA	NA	NA	NA	
Xylenes (ug/L)	---	NA	NA	NA	NA	NA	NA	
F1 (ug/L)	---	NA	NA	NA	NA	NA	NA	
F2 (ug/L)	---	NA	NA	NA	NA	NA	NA	
F3 (ug/L)	---	NA	NA	NA	NA	NA	NA	
F4 (ug/L)	---	NA	NA	NA	NA	NA	NA	
Acenaphthene (ug/L)	---	NA	NA	NA	NA	NA	NA	
Acenaphthylene (ug/L)	---	NA	NA	NA	NA	NA	NA	
Acridine (ug/L)	---	NA	NA	NA	NA	NA	NA	
Benzo(a)anthracene (ug/L)	---	NA	NA	NA	NA	NA	NA	
Benzo(o)pyrene (ug/L)	---	NA	NA	NA	NA	NA	NA	
Benzo(b)fluoranthene (ug/L)	---	NA	NA	NA	NA	NA	NA	
Benzo(g,h,i)perylene (ug/L)	---	NA	NA	NA	NA	NA	NA	
Benzo(k)fluoranthene (ug/L)	---	NA	NA	NA	NA	NA	NA	
Chrysene (ug/L)	---	NA	NA	NA	NA	NA	NA	
Dibenzo(ah)anthracene (ug/L)	---	NA	NA	NA	NA	NA	NA	
Fluoranthene (ug/L)	---	NA	NA	NA	NA	NA	NA	
Fluorene (ug/L)	---	NA	NA	NA	NA	NA	NA	
Indeno(1,2,3-cd)pyrene (ug/L)	---	NA	NA	NA	NA	NA	NA	
1+2-Methylnaphthalenes (ug/L)	---	NA	NA	NA	NA	NA	NA	
1-Methylnaphthalene (ug/L)	---	NA	NA	NA	NA	NA	NA	
2-Methylnaphthalene (ug/L)	---	NA	NA	NA	NA	NA	NA	
Napthalene (ug/L)	1.4	NA	NA	NA	NA	NA	NA	
Phenanthrene (ug/L)	---	NA	NA	NA	NA	NA	NA	
Pyrene (ug/L)	---	NA	NA	NA	NA	NA	NA	
Quinoline (ug/L)	---	NA	NA	NA	NA	NA	NA	

- Oil and Grease parameters exceed the maximum allowable concentrations at ALT-2 for Oil and Grease.
- TSS exceeded the Licence parameters of 70mg/L. DND is in the process of conducting background sampling program of other small tributaries away from DND activities to ascertain if the 70mg/L set criteria is achievable in natural tributaries in the Alert area. This action item is ongoing in order to collect a multiyear data set.
- Lead, Copper, Nickel and Zinc exceedances are likely attributable to atmospheric deposition. DND is in the process of conducting a multiyear background sampling program away from DND activities to link correlations in the summer of 2022-2034. DND has also obtained a third party consultant (Chemist) to report on these observed exceedances. A report will be provided to the NWB once finalized.
- The analytical certificates detailing the 2022 performance of the Alert Sewage Terrace System is included in this Appendix (B).
- Due to limited personnel on Station during 2022 and COVID 19 constraints and frequent safety concerns associated with wildlife interactions, limited samples were collected. DND is committed to demonstrating compliance to the NWB Licence.

Appendix C

Monitoring Program Stations No. ALT-4-5-6-7

Year: 2022

Description: Runoff and Leachate.

Results:

June (Runoff Season)

Unfortunately, there was no water to sample at stations ALT- 6 and 7 for analytical results. Analytical Results for ALT-4 and 5, are summarized below and attached in Appendix E and Appendix F.

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Jun-22				
			30-Jun-22	30-Jun-22
	Licence Specific Criteria		Alt-4	Alt-5
Benzene (ug/L)	370		NA	NA
Toluene (ug/L)	2		NA	NA
Ethylbenzene (ug/L)	90		NA	NA
Lead (ug/L)	1		8.96	0.192
Oil and Grease (mg/L)	15 (NVS)		7.8	ND
Phenols (ug/L)	20		7.3	7.5
BOD ₅ (mg/L)	80		NA	NA
pH			8.09	8.13
TSS (mg/L)	70		105	ND
Oil and Grease (mg/L)	5 (NVS)		7.8	ND
	CCME Criteria (marine)			
pH	7.0 to 8.7		8.09	8.13
Conductivity	---		160	306
Temperature (field)	---			
TSS (mg/L)	---		105	ND
Oil and Grease (mg/L)	---		7.8	ND
Nitrate-Nitrite (mg/L)	---		0.209	ND
Ammonia Nitrogen (mg/L)	---		0.0073	0.018
Sulphate (mg/L)	---		10.1	29.6
Total Hardness (mg/L)	---		99.5	85
Total Alkalinity (mg/L)	---		56.8	66.1
Total Phenols (mg/L)	---		0.0073	0.0075
TOC (mg/L)	---		1.34	4.8
Fecal Coliforms (CFU/100mL)	---		NA	NA
Aluminum (mg/L)	---		2.01	0.193
Antimony (mg/L)	0.5		NA	NA
Arsenic (mg/L)	0.0125		0.0048	0.00068
Cadmium (mg/L)	0.12		0.0000319	ND
Calcium (mg/L)	---		30.3	22
Chromium (mg/L)	---		0.0039	ND
Copper (mg/L)	0.002		0.00834	0.00208
Iron (mg/L)	---		3.54	0.188
Lead (mg/L)	0.002		0.00396	0.00192
Magnesium (mg/L)	---		5.8	7.3
Mercury (mg/L)	0.00016		0.0000056	ND
Nickle (mg/L)	0.0083		0.00992	0.00136
Potassium (mg/L)	---		1.47	4.95
Silver (mg/L)	---		0.000025	ND
Sodium (mg/L)	---		4.93	24.8
Zinc (mg/L)	0.01		0.0176	ND
BOD ₅ (mg/L)	---		NA	NA
Chloride (mg/L)	---		NA	NA
Benzene (ug/L)	110		NA	NA
Ethylbenzene (ug/L)	25		NA	NA
Toluene (ug/L)	215		NA	NA
Xylenes (ug/L)	---		NA	NA
F1 (ug/L)	---		NA	NA
F2 (ug/L)	---		NA	NA
F3 (ug/L)	---		NA	NA
F4 (ug/L)	---		NA	NA
Acenaphthene (ug/L)	---		NA	NA
Acenaphthylene (ug/L)	---		NA	NA
Acridine (ug/L)	---		NA	NA
Benzo(a)anthracene (ug/L)	---		NA	NA
Benzo(o)pyrene (ug/L)	---		NA	NA
Benzo(b)fluoranthene (ug/L)	---		NA	NA
Benzo(g,h,i)perylene (ug/L)	---		NA	NA
Benzo(k)fluoranthene (ug/L)	---		NA	NA
Chrysene (ug/L)	---		NA	NA
Dibenzo(ah)anthracene (ug/L)	---		NA	NA
Fluoranthene (ug/L)	---		NA	NA
Fluorene (ug/L)	---		NA	NA
Indeno(1,2,3-cd)pyrene (ug/L)	---		NA	NA
1+2-Methylnaphthalenes (ug/L)	---		NA	NA
1-Methylnaphthalene (ug/L)	---		NA	NA
2-Methylnaphthalene (ug/L)	---		NA	NA
Napthalene (ug/L)	1.4		NA	NA
Phenanthrene (ug/L)	---		NA	NA
Pyrene (ug/L)	---		NA	NA
Quinoline (ug/L)	---		NA	NA

- TSS exceeded the Licence parameters of 70mg/L at ALT-4.
- Lead, Copper, Nickel and Zinc exceedances are likely attributable to atmospheric deposition. DND is in the process of conducting a multiyear background sampling program away from DND activities to link correlations in the summer of 2022-2024. DND has also obtained a third party consultant (Chemist) to report on these observed exceedances. A report will be provided to the NWB once finalized.

July

The Department of National Defence was successful in collecting and analyzing samples at Monitoring Program Station ALT-4, during the period of runoff in July 2022. Unfortunately, there was no water to sample at ALT- 5,6 and 7 for analytical results. Analytical Results for ALT-4, are summarized below and attached in Appendix E and Appendix F.

Jul-22		
		05-Jul
	Licence Specific Criteria	Alt-4
Benzene (ug/L)	370	NA
Toluene (ug/L)	2	NA
Ethylbenzene (ug/L)	90	NA
Lead (ug/L)	1	2.99
Oil and Grease (mg/L)	15 (NVS)	ND
Phenols (ug/L)	20	4.2
BOD ₅ (mg/L)	80	NA
pH		8.06
TSS (mg/L)	70	27.9
Oil and Grease (mg/L)	5 (NVS)	ND
	CCME Criteria (marine)	
pH	7.0 to 8.7	8.06
Conductivity	---	190
Temperature (field)	---	
TSS (mg/L)	---	27.9
Oil and Grease (mg/L)	---	ND
Nitrate-Nitrite (mg/L)	---	0.188
Ammonia Nitrogen (mg/L)	---	ND
Sulphate (mg/L)	---	15.3
Total Hardness (mg/L)	---	99.8
Total Alkalinity (mg/L)	---	66.2
Total Phenols (mg/L)	---	0.0042
TOC (mg/L)	---	1.39
Fecal Coliforms (CFU/100mL)	---	NA
Aluminum (mg/L)	---	1.53
Antimony (mg/L)	0.5	NA
Arsenic (mg/L)	0.0125	0.00384
Barium (mg/L)		NA
Beryllium (mg/L)		NA
Bismuth (mg/L)		NA
Boron (mg/L)		NA
Cadmium (mg/L)	0.12	0.0000302
Calcium (mg/L)	---	30.1
Chromium (mg/L)	---	0.00298
Cobalt (mg/L)		NA
Copper (mg/L)	0.002	0.0009
Iron (mg/L)	---	2.59
Lead (mg/L)	0.002	0.0009
Lithium (mg/L)		NA
Magnesium (mg/L)	---	5.98
Manganese (mg/L)		NA
Mercury (mg/L)	0.00016	0.0000054
Molybdenum (mg/L)		NA
Nickle (mg/L)	0.0083	0.00776
Phosphorus (mg/L)		NA
Potassium (mg/L)	---	1.64
Selenium (mg/L)		NA
Silicon (mg/L)		NA
Silver (mg/L)		0.000021
Sodium (mg/L)	---	5.76
Stontonium (mg/L)		NA
Sulfur (mg/L)		NA
Thallium (mg/L)		NA
Tin		NA
Titanium (mg/L)		NA
Uranium (mg/L)		NA
Vanadium (mg/L)		NA
Zinc (mg/L)	0.01	0.04
BOD ₅ (mg/L)	---	NA
Chloride (mg/L)	---	NA
Benzene (ug/L)	110	NA
Ethylbenzene (ug/L)	25	NA
Toluene (ug/L)	215	NA
Xylenes (ug/L)	---	NA
F1 (ug/L)	---	NA
F2 (ug/L)	---	NA
F3 (ug/L)	---	NA
F4 (ug/L)	---	NA
Acenaphthene (ug/L)	---	NA
Acenaphthylene (ug/L)	---	NA
Acridine (ug/L)	---	NA
Benzo(a)anthracene (ug/L)	---	NA
Benzo(o)pyrene (ug/L)	---	NA
Benzo(b)fluoranthene (ug/L)	---	NA
Benzo(g,h,i)perylene (ug/L)	---	NA
Benzo(k)fluoranthene (ug/L)	---	NA
Chrysene (ug/L)	---	NA
Dibenzo(ah)anthracene (ug/L)	---	NA
Fluoranthene (ug/L)	---	NA
Fluorene (ug/L)	---	NA
Indeno(1,2,3-cd)pyrene (ug/L)	---	NA
1+2-Methylnapthalenes (ug/L)	---	NA
1-Methylnapthalene (ug/L)	---	NA
2-Methylnapthalene (ug/L)	---	NA
Napthalene (ug/L)	1.4	NA
Phenanthrene (ug/L)	---	NA
Pyrene (ug/L)	---	NA
Quinoline (ug/L)	---	NA

- Lead and Copper exceedances are likely attributable to atmospheric deposition. DND is in the process of conducting a multiyear background sampling program away from DND activities to link correlations in the summer of 2022-2024. DND has also obtained a third party consultant (Chemist) to report on these observed exceedances. A report will be provided to the NWB once finalized. The report is expected to be finalized in 2025.

August

The Department of National Defence was not successful in collecting samples at Monitoring Program Station ALT-4, 5, 6 or 7, during the period of runoff in August 2022 as the sampling stations were dry and free from any standing or flowing water.

September

The Department of National Defence was not successful in collecting samples at Monitoring Program Station ALT-4, 5, 6 or 7, during the period of runoff in September 2022 as the sampling stations were dry and free from any standing or flowing water.

Appendix D

Monitoring Program Stations No. ALT-8-9-10-11

Year: 2022

Description: Discharge from Tank Farm Secondary Containments ALT-8-9-10 & Landfarm Facility ALT-10-11.

Results:

The Department of National Defence (DND) intended to discharge water from the Fuel Tank Farm Secondary Containments at ALT-8-9-10 in June 2022. At least 10 days notice was provided to the Inspector and Nunavut Water Board, the email chain is attached below.

Water samples from within the secondary containments of ALT-8-8.1-9 were collected on 30 June 2022 and analyzed; analytical results are summarized below and attached in Appendix E. Unfortunately ALT-10 Day tank containment was dry with no standing water to sample.

Two samples were taken at ALT-8 (sample identifications: ALT-8 and ALT-8.1) to better represent the freshet quality due to the large size of the Secondary Containment facility.

Water sample at ALT-8 was found to have lead exceedances. As directed, DND used our cylindrical filtrations system to decant the water at this location.

In June 2022, analytical results (Appendix E) of the berm water results at the Lower Airfield Tank Farm (ALT- 8.1), Upper Tank Farm (ALT-9), and the Day Tank (Dry) (ALT-10) are compliant to the Effluent Quality Limits of the Alert Water Licence, as per Part E, Item 12 and 13.

DND had no intentions to discharge any water from Land Farm Treatment Facilities at ALT-11 and ALT-12.

Notes (extra spaces removed):

Thank you Joseph for the email and support.

I will have the Station follow the plan and both Nathan and I will be returning to CFS Alert on 23 Aug to 08 Sep to provide internal DND oversight on the filtration treatment process.

Have a good day.

Regards,
Andrew

Andrew Tam, PhD.
(he, him / il, lui)

8 Wing Environment Officer, Environmental Management
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From: Monteith, Joseph [<mailto:joseph.monteith@rcaanc-cirnac.gc.ca>]

Sent: August 2, 2022 1:33 PM

To: Tam A@CFB Trenton WENV@Trenton <Andrew.Tam@forces.gc.ca>

Subject: Re: 8AC-ALT1929 - CFS Alert - Berm Secondary Containment Water Discharge Approval Request 2022

Hello,

After our discussion, I am okay with the decants of the berm water. Provided they are done with the cylindrical filtrations systems as discussed.

I have seen these filtrations systems and find them appropriate to use to decant berm water.

Regards,

Joseph Monteith
CIRNAC
Water Resource Officer
1 867 975-1787

From: Andrew.Tam@forces.gc.ca <Andrew.Tam@forces.gc.ca>

Sent: Monday, July 25, 2022 8:56 AM

To: joseph.monteith@canada.ca <joseph.monteith@canada.ca>; jeremy.fraser@canada.ca <jeremy.fraser@canada.ca>

Cc: NATHAN.KOUTROULIDES@forces.gc.ca <NATHAN.KOUTROULIDES@forces.gc.ca>

Subject: 8AC-ALT1929 - CFS Alert - Berm Secondary Containment Water Discharge Approval Request 2022

Good morning Joseph and Jeremy;

Nathan is away on vacation this week and I just returned from summer leave, I just received our lab analytical results (attached) of the water grab samples obtained during June & July 2022 Surveillance Monitoring Program at CFS Alert, Nunavut.

The berm water results at the Lower Airfield Tank Farm (ALT-8.1 White Tanks) and the Upper Tank Farm (ALT-9) are compliant to the Effluent Quality Limits of the Alert Water Licence, as per Part E, Item 12.

As per the condition of Part E, Item 13, I am providing DND's intent to discharge the effluents

from the ALT 8.1 & ALT-9 fuel tank farms ONLY within 10 days; however, to help expedite the process and given Alert's short outdoor summer season, may I please request your approval to discharge the effluents from these two facilities as soon as possible?

However and unfortunately, the other half of the Lower Airfield Tank Farm at ALT-8 (the berm with the set of older Red/Orange Tanks) exceeded lead criteria (1.0 ug/L). The 2022 ALT-8 results in June was 1.44 ug/L and in July was 2.29 ug/L.

I will request the Station to HOLD the berm water from ALT-8 (Red/Orange Tanks) from being discharged. DND does have a mobilize portable Oil/Water/Lead Metal Filtration System (filtration & activated Carbon system) that can be mobilized and brought operational to treat these berm water; in the past, when this system was used to treat Alert's berm water for lead metals, we request three (3) effluent discharge water quality (lead metal) sampling during its operation (beginning, middle, and end) for lab testing with the results sent to the CIRNA Inspectors, would this approach be acceptable?

I will also issue DND direction the CFS Alert staff responsible for the water discharges to ensure that no ruts in the tundra are created and to ensure that sediment erosion protections are taken as per the Alert Water Management plan.

Please let me know if ALT-8.1 and ALT-9 berm water can be discharged sooner (winter resumes by end Aug), and if the filtration treatment system approach for ALT-8's lead situation is acceptable?

Kind regards,
Andrew

Andrew Tam, PhD.
(he, him / il, lui)

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Jun-22					
			30-Jun-22	30-Jun-22	30-Jun-22
	Licence Specific Criteria		Alt-8	Alt-8.1	Alt-9
Benzene (ug/L)	370		ND	ND	ND
Toluene (ug/L)	2		ND	ND	ND
Ethylbenzene (ug/L)	90		ND	ND	ND
Lead (ug/L)	1		1.44	0.152	0.305
Oil and Grease (mg/L)	15 (NVS)		ND	ND	ND
Phenols (ug/L)	20		5.3	5.7	4.7
BOD ₅ (mg/L)	80		NA	NA	NA
pH			8.14	8.12	7.96
TSS (mg/L)	70		ND	ND	ND
Oil and Grease (mg/L)	5 (NVS)		ND	ND	ND
	CCME Criteria (marine)				
pH	7.0 to 8.7		8.14	8.12	7.96
Conductivity	---		194	156	108
Temperature (field)	---				
TSS (mg/L)	---		ND	ND	ND
Oil and Grease (mg/L)	---		ND	ND	ND
Nitrate-Nitrite (mg/L)	---		ND	ND	ND
Ammonia Nitrogen (mg/L)	---		ND	ND	ND
Sulphate (mg/L)	---		10.8	8.78	3.21
Total Hardness (mg/L)	---		68	67.6	48.2
Total Alkalinity (mg/L)	---		70	62.3	48.7
Total Phenols (mg/L)	---		0.0053	0.0057	0.0047
TOC (mg/L)	---		2.82	2.52	0.83
Fecal Coliforms (CFU/100mL)	---		NA	NA	NA
Aluminum (mg/L)	---		0.06	0.0403	0.0711
Antimony (mg/L)	0.5		NA	NA	NA
Arsenic (mg/L)	0.0125		0.00256	0.00253	0.00116
Cadmium (mg/L)	0.12		0.0000123	0.0000054	ND
Calcium (mg/L)	---		18.8	19.4	15.8
Chromium (mg/L)	---		0.00168	ND	ND
Copper (mg/L)	0.002		0.00254	0.00267	0.00108
Iron (mg/L)	---		0.085	0.041	0.105
Lead (mg/L)	0.002		0.00144	0.000152	0.000305
Magnesium (mg/L)	---		5.12	4.66	2.12
Mercury (mg/L)	0.00016		ND	ND	ND
Nickle (mg/L)	0.0083		0.00154	0.00164	0.00116
Potassium (mg/L)	---		3.04	2.01	0.649
Silver (mg/L)	---		ND	ND	ND
Sodium (mg/L)	---		11.2	3.2	1.62
Zinc (mg/L)	0.01		0.0049	ND	0.0042
BOD ₅ (mg/L)	---		NA	NA	NA
Chloride (mg/L)	---		NA	NA	NA
Benzene (ug/L)	110		ND	ND	ND
Ethylbenzene (ug/L)	25		ND	ND	ND
Toluene (ug/L)	215		ND	ND	ND
Xylenes (ug/L)	---		ND	ND	ND
F1 (ug/L)	---		ND	ND	ND
F2 (ug/L)	---		ND	ND	ND
F3 (ug/L)	---		ND	ND	ND
F4 (ug/L)	---		ND	ND	ND
Acenaphthene (ug/L)	---		NA	NA	NA
Acenaphthylene (ug/L)	---		NA	NA	NA
Acridine (ug/L)	---		NA	NA	NA
Benzo(a)anthracene (ug/L)	---		NA	NA	NA
Benzo(o)pyrene (ug/L)	---		NA	NA	NA
Benzo(b)fluoranthene (ug/L)	---		NA	NA	NA
Benzo(g,h,i)perylene (ug/L)	---		NA	NA	NA
Benzo(k)fluoranthene (ug/L)	---		NA	NA	NA
Chrysene (ug/L)	---		NA	NA	NA
Dibenzo(ah)anthracene (ug/L)	---		NA	NA	NA
Fluoranthene (ug/L)	---		NA	NA	NA
Fluorene (ug/L)	---		NA	NA	NA
Indeno(1,2,3-cd)pyrene (ug/L)	---		NA	NA	NA
1+2-Methylnaphthalenes (ug/L)	---		NA	NA	NA
1-Methylnaphthalene (ug/L)	---		NA	NA	NA
2-Methylnaphthalene (ug/L)	---		NA	NA	NA
Naphthalene (ug/L)	1.4		NA	NA	NA
Phenanthrene (ug/L)	---		NA	NA	NA
Pyrene (ug/L)	---		NA	NA	NA
Quinoline (ug/L)	---		NA	NA	NA

Appendix E

Analytical Results for ALT-2-3-4-5-6-7-8-9-10-11-12

Year: 2022

Description: Analytical Results for June/July 2022 attached as separate PDF.

Appendix F

Analytical Results for ALT-2-3-4-5-6-7-8-9-10-11-12

Year: 2022

Description: Analytical Results for August/September 2022 attached as separate PDF.

Appendix G

List of Waste Disposal Activities

Year: 2022

Reference: 8AC-ALT1929

Monthly Waste Incineration at CFS Alert - 8AC-ALT1929					
Year [yr]	Month [mo]	Incineration Days per Month [day]	Solid waste Incinerated (Millionaire's Dump) [lbs]	Liquid Waste Incinerated [Liters]	Loose Waste Incinerated (Main Station Landfill) [lbs]
2022	JAN	8	800	4	2800
2022	FEB	12	1800	12	4400
2022	MAR	13	0	3	6000
2022	APR	7	1050	4	3700
2022	MAY	10	5400	687	1800
2022	JUN	11	3600	833	3200
2022	JUL	12	6600	33	2200
2022	AUG	20	1200	0	7600
2022	SEP	11	400	2	4200
2022	OCT	9	2400	0	3600
2022	NOV	8	3000	200	3200
2022	DEC	6	1200	0	2800
Annual Average [lbs/L/mo]:			2288	148	3792
Observed Minimum [Lbs/L/mo]:			0	0	1800
Observed Maximum [Lbs/L/mo]:			6600	833	7600

Main Station Landfill:

-Deposition of non-hazardous incinerator ash and all acceptable materials to site.

Millionaire's Dump:

-In 2018 the Millionaire's dump was closed to disposal of all station waste. No material was placed in the dump in 2022

Battery Dump:

-No wastes were deposited at this site; no waste deposition is allowed at this site. The battery bump was recapped in September 2022.

Dump #3:

-No wastes were deposited at this site; no waste deposition is allowed at this site.

Landfarms:

ALT-11 Landfarm

- ALT-11 (Airfield Land arm) is currently at capacity. No new material was added to this location in 2022.

ALT 12 (Day tank)

- Repairs to the liner were made in summer 2021. The facility was constructed back to original design drawings. Contaminated material was then placed back into containment. The land farm was then treated and turned in fall 2022. Sampling of material was completed to establish base line data. Future sampling will be conducted and monitored as the remediation process continues.

Hazardous Waste Backhauled from CFS Alert in 2022:

Hazmat and Dangerous cargo items shipped from Alert (2022)			
TCN	DESCRIPTION	DATE SHIPPED	TTL NET QTY
AL 2290 SM 002	PROPYLENE GLYCOL	25-Oct-22	2522 LBS
AL 2314 CR 003	ETHANOL, ISOPROPANOL	30-Nov-22	960L
AL 2258 SM 004	BATTERIES NON REGULATED	12-Oct-22	2017 LBS
AL 2189 PD 005	PROPYLENE GLYCOL	20-Jul-22	6288 LBS
AL 2189 PD 001	PROPYLENE GLYCOL	27-Jul-22	2260 LBS
AL 2189 PD 003	FLAMMABLE LIQUID, N.O.S.	16-Jul-22	88 L
AL 2189 PD 003	PROPYLENE GLYCOL	16-Jul-22	1556 LBS
AL 2189 PD 010	LITHIUM ION BATTERIES	16-Jul-22	22 LBS
AL 2167 PD 001	LITHIUM ION BATTERIES	22-Jun-22	100 LBS
AL 2131 CM 002	LITHIUM ION BATTERIES	13-May-22	220 LBS
AL 2131 CM 002	METHANOL	13-May-22	10.2 L
AL 2131 CM 002	HYDROCHLORIC ACID	13-May-22	1.16L
AL 2131 CM 002	BUTANOLS	13-May-22	0.08L
AL 2102 JF 002	BATTERIES NON REGULATED	14-Apr-22	2243 LBS
AL 2102 JF 003	MERCURY	13-Apr-22	111 LBS

CFS Alert Hazardous Waste Generator #NUG100048;
DND Hazardous Waste Carrier #NUC200012.

All hazardous wastes from CFS Alert were collected at 8 Wing Trenton and transferred to contractors for proper disposal under 8 Wing Trenton's Ontario Hazardous Waste Generator #ON0046507.

Appendix F

Progressive and Final Reclamation Work Undertaken

Year: 2022

Reference: 8AC-ALT1929, Part B, Item 1.

Progressive Reclamation Work Undertaken in 2022:

A. Contaminated Sites In-Situ Bioremediation Work:

Continuation of the pilot scale in-situ bioremediation study for petroleum hydrocarbon biodegradation at the following sites:

- 1) Oxidator Building;
- 2) Baker's Dozen.

Develop long term monitoring program for PHC contamination in key areas.

Due to COVID-19 world pandemic the Station was a minimal manning during the 2022 season. Limited to Emergency access only. As such no work was completed as previously scheduled.

B. Reclaim of Soils in the Landfarm (ALT-11) Treatment Facility:

Regular monitoring of the downgrade area adjacent to the large biopile area will be performed to ensure no PHC contamination is moving from biopile area or from contaminated areas upgradient and to the west of the large biopile area.

C. Rotation of Soils in the Landfarm (ALT-11) Treatment Facilities:

Continuation of the microbial nutrient augmentation and aeration process to increase oxygen content in the contaminated soil to promote microbial and bacterial activity within the landfarm facilities. This will be conducted at the ALT-11 Landfarms.

Future works proposed for 2023:

A. Contaminated Sites In-Situ Bioremediation Work:

Continuation of the pilot scale in-situ bioremediation study for petroleum hydrocarbon biodegradation at the following sites:

- 1) Oxidator Building;
- 2) Baker's Dozen.

Develop long term monitoring program for PHC contamination in key areas.

B. Rotation of Soils in the Landfarm (ALT-11) Treatment Facilities:

Continuation of the microbial nutrient augmentation and aeration process to increase oxygen content in the contaminated soil to promote microbial and bacterial activity within the landfarm facilities. This will be conducted at the ALT-11 Landfarms.

C. In-Situ Bio-Containment Pilot Research Study:

As indicated with the INAC Inspectors during the 2018 Inspections, DND is taking a proactive approach, developing novel bio-containment barriers, to treat runoff and subsurface waters generated and passing through the boundaries of Federal Contaminated Sites. This activity will be conducted, and the effectiveness assessed, through a pilot research project with the National Research Council of Canada. The general purpose of these bio-containment barriers is to develop a microbial technology solution for bioremediation of runoff and subsurface waters that pass through and/or are generated from contaminated sites prior to reaching the Arctic Ocean. This work has applicability for the entire Canadian Arctic environment.

D. Environmental Sampling for Per- and polyfluoroalkyl substances (PFC) Delineation

Further conduct environmental sampling and screening for PFCs as well as to evaluate the potential of biodegradation of PFC as a remediation approach.

E. Phase 2 Environmental Site Assessment (ESA)/ Detailed Risk Assessment

DND has procured a firm to conduct a Phase 2 ESA/ detailed risk assessment to be conducted on the entire station for 2023 limited to contracting and COVID restrictions.

F. Landfill Reclamation Plan

DND has procured a firm to conduct a Landfill Reclamation plan to be conducted on the ALT- 5, 6 and 7 for 2023 limited to contracting and COVID restrictions

Appendix H

Proposed/ future Infrastructure Works

Year: 2022

Reference: 8AC-ALT1929 Schedule B item I.

Infrastructure Work Undertaken in 2021:

Due to COVID-19 world pandemic the Station was a minimal manning during the 2022 season. Limited to Emergency access only. As such no work was completed as previously scheduled.

Future works proposed for 2023:

A. Sewage Discharge Flow Monitoring:

Installation of a flow monitor on the discharge point of ALT-2 will be installed in the summer of 2023 as was previously planned for 2020 but delayed due to COVID and engineering issues with current piping system and the gage. Results will be published in the 2023 Annual report or when requested.

B. Temporary Contaminated Soil Storage

DND proposed and was approved to construct a 1,000m³ capacity contaminated soils storage facility, this would allow existing contaminated soil piles that are not currently contained to be placed in a safe storage space, until the new large storage space is construct North East (NE) of the Alert's Runway. The overall footprint is 33m x 43m x 1.75m in height and located 200m West by North West (WNW) of the "Millionaire's Dump" (ALT-6).

D. Construct new waterline planned 2024/25.

During the winter of 2020/2021 the current water lines from Dumbell Bay to the Alert water treatment facility froze solid and broke the waterlines in 26 places along the 2km stretch of line. This summer, construction of a new waterline is expected to take place to replace the existing waterline and provide upgraded safeguards to ensure freeze protection going forward.