Results of the Water Quality Monitoring Program for Coldwater Fisheries

Sudbury to Hudson Reliability Project

MARCH 2022 – MAY 2022

JUNE 2022

PREPARED FOR

Eversource Energy

PREPARED BY

SWCA Environmental Consultants

RESULTS OF THE WATER QUALITY MONITORING PROGRAM FOR COLDWATER FISHERIES
SUDBURY TO HUDSON RELIABILITY PROJECT
MARCH 2022 – MAY 2022

Prepared for

Eversource Energy
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SWCA Project No. 67849

June 2022

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1 INTRODUCTION

The Sudbury to Hudson Reliability Project (Project) consists of a new, approximately 9-mile-long transmission line between Eversource's existing Sudbury substation in Sudbury, Massachusetts, and the Hudson Light & Power Company's (HL&P) substation in Hudson, Massachusetts. The new underground transmission line will be installed in the municipalities of Sudbury, Hudson, Stow, and Marlborough, Massachusetts. Approximately 7.5 miles of the new transmission line will be installed within an inactive Massachusetts Bay Transportation Authority (MBTA) railroad right-of-way (ROW) which is to be converted into the Massachusetts Central Rail Trail (MCRT).

Special Condition Part I(q) of the Sudbury Order of Conditions (OOC) for the Project required baseline monitoring of flow and water quality for all Coldwater Fisheries Resources (CFR) crossed by the Project. SWCA has prepared this quarterly summary of the water quality monitoring for the two (2) crossings of CFR in Hop Brook and six (6) other streams or tributaries that contribute to CFR and are crossed by the Project (see Figures in Appendix A).

The following eight streams were included in this monitoring plan as requested by the Sudbury Conservation Commission:

- Hop Brook – Bridge 128 (400+30): ST 400 Perennial Stream and State-listed CFR;
- Unnamed Stream (527+30): ST 527 Intermittent Stream and local CFR;
- Dudley Brook (539+40): ST 540 Perennial and local CFR;
- Unnamed intermittent stream (560+82): ST 561 Intermittent and local CFR;
- Unnamed Intermittent stream (593+18): ST 593 Intermittent and local CFR;
- Intermittent Tributary to Hop Brook (700+50, 710+50): ST 700/710 Intermittent and local CFR;
- Hop Brook (Bridge 127) (725+00): ST 725 Perennial Stream and State-listed CFR; and
- Intermittent Tributary to Wash Brook (747+39): ST 747 Intermittent and local CFR.

2 WATER QUALITY MONITORING METHODS AND RESULTS

2.1 Surface Water Monitoring Methods

In accordance with the *Baseflow and Baseline Water Quality Monitoring Program for Cold Water Fisheries* proposed by SWCA dated August 25, 2021 and approved by the Sudbury Conservation Commission, the following parameters were monitored on a monthly basis:

- temperature, dissolved oxygen, as well as pH, specific conductivity, and oxygen reduction potential (ORP) measured with a YSI multi-meter;
- flow velocity with a Hach FH950 flow velocity meter;
- turbidity levels measured with a turbidity meter; and

- chlorine, hardness and alkalinity measured with field test strips.

Based on the Massachusetts Surface Water Quality Standards (SWQS) (314 CMR 4.00), CFRs have special designated criteria for dissolved oxygen and temperature. All other criteria are the same as those for warm water fisheries.

The following Table 1 includes ranges for temperature, dissolved oxygen and pH that are favorable to cold water fisheries. Table 2 indicates ranges for other surface water criteria that are favorable for freshwater fish.

Table 1. Surface Water Conditions for Cold Water Fisheries

Parameter[1]	Favorable Ranges for Cold Water Fisheries
Temperature	below 20ºC (up to 26ºC for 24 hours)
Dissolved Oxygen	min of 6 mg/L, up to 7 mg/L preferred
pH	6.5 - 8.3

Note: C = Celsius; mg/L = milligrams per liter

Source:

1: 314 CMR 4.00: Massachusetts Surface Water Quality Standards

Table 2. Surface Water Conditions for Freshwater Fish

Parameter	Favorable Ranges for Freshwater Stream or Fish
Specific Conductivity[1]	150 - 500 µs/cm
Turbidity[2]	"free from turbidity that would impair fish habitat"
Chlorine[3]	<4 mg/L
Alkalinity[4,5]	20 - 300 mg/L

Note: ORP = oxygen reduction potential; mg/L = milligrams per liter; µs/cm = microsiemens per centimeter; mV = millivolts

Sources:

1: EPA Volunteer Stream Monitoring: A Methods Manual

2: 314 CMR 4.00: Massachusetts Surface Water Quality Standards

3: EPA National Primary Drinking Water Regulations

4: UMass Dartmouth Northeast Regional Aquaculture Center NRAC Fact Sheet No. 170-1993.

5: EPA National Recommended Water Quality Criteria for Aquatic Life.

SWCA monitored these eight locations on March 18, April 22, and May 23, 2022. All crossings were observed to be flowing to some extent with the exception of the unnamed stream at station 593, which has been dry since August when the initial survey was conducted, as well as the Hop Brook Tributary at station 700 in April 2022. Temperature and dissolved oxygen can fluctuate naturally when the sun rises and enables aquatic plants to release more oxygen. Sampling was conducted in the same order of monitoring points and as a result, the sampling was conducted during roughly the same time of day at each location each month to help ensure comparability over time. The Table 3 attached to this report in Appendix B summarizes the data collected during each of these monitoring events. The individual summary field logs are also included in Appendix C.

2.2 Temperature

Results of the monitoring indicate that the temperatures of all the monitoring points were below 20 degrees Celsius in the months of March and April; and therefore, are within normal ranges for cold water fisheries. Temperatures at Stations 400, 561, 700, 710, and 725 exceeded 20 degrees Celsius in May, while the other stations remained below 20 degrees.

2.3 Dissolved Oxygen

Dissolved oxygen levels were lower than the favorable value of 6 mg/L in May at Stations 527, 540, 700, and 710, and in March at Station 700. However, levels measured for all other monitoring events were all above 6 mg/L for all other locations. Levels of dissolved oxygen decreasing is evident in all monitoring locations due to the warmer weather and the warmer temperatures in the surface water.

2.4 pH

Results of the monitoring indicate that in the unnamed intermittent stream at Station 527, the pH was lower than 6.5 for the monitoring events in March and April for both upgradient and downgradient locations, with the readings in May reported as just above 6.5. The rest of the monitoring locations reported all the pH levels to be within normal ranges for cold water fisheries at 6.5-8.3.

2.5 Specific Conductivity

The monitoring parameter for specific conductivity for freshwater was exceeded with values above 500 µS/cm at Stations 400 and 700 for all three monitoring events; at Stations 540 and 561, and downgradient of Station 527 in May; and at Stations 725 and 747 in April and May. All other monitoring events were within the acceptable range of 150-500 µS/cm.

2.6 Turbidity

Turbidity levels are not specifically defined by a standard value in Massachusetts. Based on available information, for the purpose of this assessment, it can be assumed that a value of less than 5 NTU is favorable for freshwater, however the lower the better as typical groundwater is less than 1 NTU. Turbidity values reported for each station were less than 5 NTUs for all monitoring events except for the March and May monitoring events at the Hop Brook Tributary (ST 700 and ST 710).

2.7 Other Parameters

The stream flow velocities from the downgradient side to the upgradient side were comparable and consistent from month to month. The ORP, alkalinity, chlorine, and hardness levels from the downgradient side to the upgradient side were comparable. Alkalinity and chlorine levels were below the favorable levels for freshwater.

3 REFERENCES

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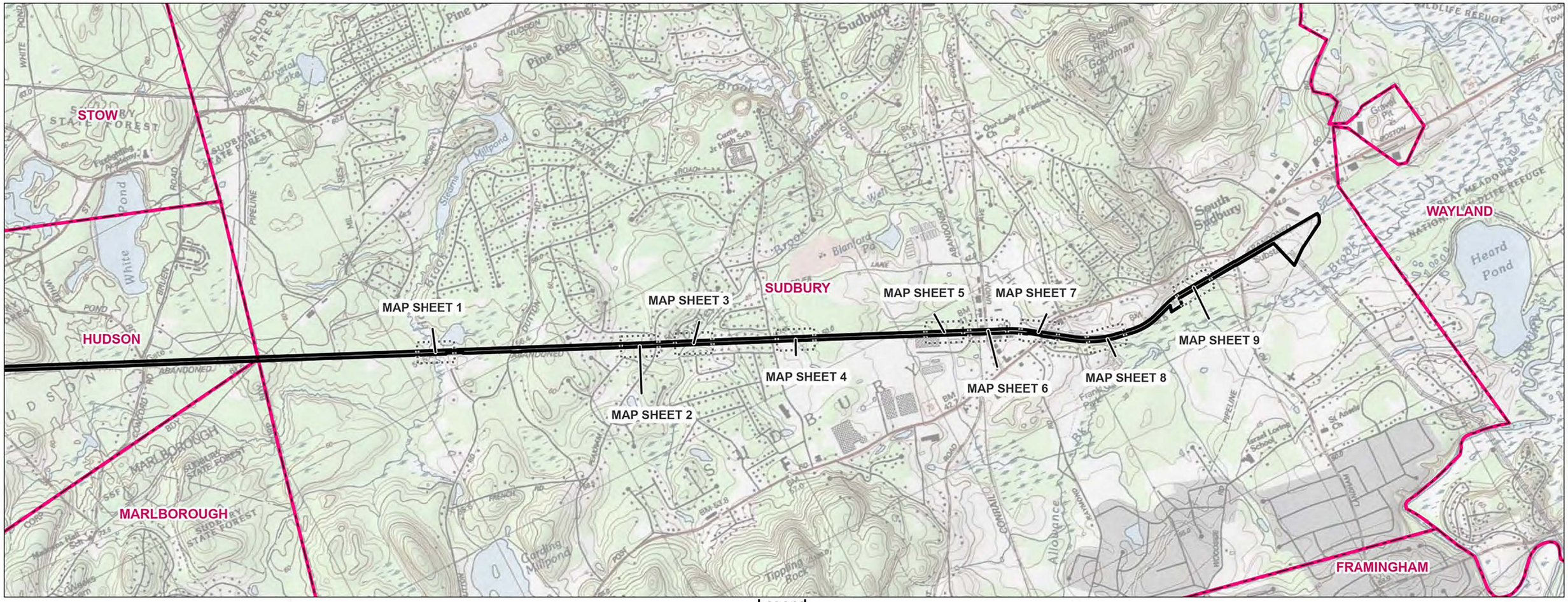
APPENDIX A

Figures Map Book

2021 - Sudbury Hudson Reliability Project

HUDSON, STOW, & SUDBURY, MA
Water Sampling Map

Date: August 11, 2021



Legend

Map Sheet Matchline

PREPARED FOR:

EVERSOURCE ENERGY
107 Selden Street
Berlin, CT 06037

N

0 0.25 0.5 Miles

INDEX OF FIGURES

Title Sheet / Index Map
Map Sheets 1-9

NO.	DATE	REVISIONS

PREPARED BY:

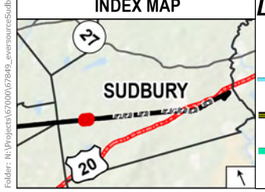
SWCA ENVIRONMENTAL CONSULTANTS
15 Research Drive
Amherst, MA 01002

SUDBURY

ST-400-D

ST-400-U

INDEX MAP



Legend

- Water Sampling Point
- Watercourse
- Limit Of Work (LOW)
- Coldwater Fisheries Line
- Open Water
- Approximate Wetland (Not Delineated)
- Existing Right-of-Way (ROW)
- Municipal Boundary

N

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Base Map: MassGIS Ortho 2019, accessed August 2021

NO.	DATE	REVISIONS

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Sudbury Hudson Reliability Project
Water Sampling Map

SUDBURY, MA

MAP SHEET 1 OF 9

Date: August, 2021

SWCA ENVIRONMENTAL CONSULTANTS

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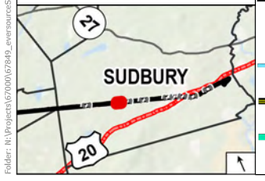
ST-527-U

ST-527-D

SUDBURY

INDEX MAP



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Sudbury Hudson Reliability Project
Water Sampling Map

SUDBURY, MA | MAP SHEET 2 OF 9

Date: August, 2021

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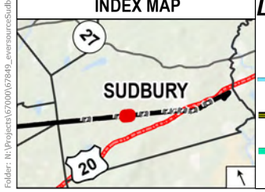
DUDLEY BROOK

ST-540-D

ST-540-U

SUDBURY

INDEX MAP



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Sudbury Hudson Reliability Project
Water Sampling Map

SUDBURY, MA

MAP SHEET 3 OF 9

Date: August, 2021

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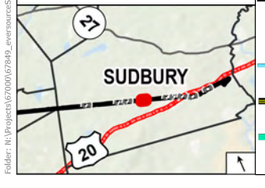
ST-561-D

ST-561-U

SUDBURY

INDEX MAP



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Base Map: MassGIS Ortho 2019, accessed August 2021

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Sudbury Hudson Reliability Project
Water Sampling Map

SUDBURY, MA | MAP SHEET 4 OF 9

Date: August, 2021

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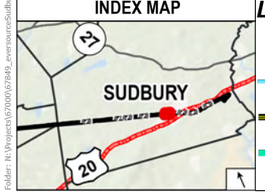
SUDBURY

ST-593-U

ST-593-D

INDEX MAP



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Base Map: MassGIS Ortho 2019, accessed August 2021

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Sudbury Hudson Reliability Project
Water Sampling Map

SUDBURY, MA | MAP SHEET 5 OF 9

Date: August, 2021

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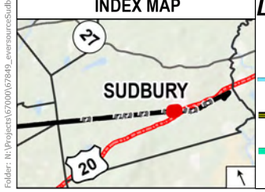
INDEX MAP



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Sudbury Hudson Reliability Project
Water Sampling Map

SUDBURY, MA | MAP SHEET 6 OF 9

Date: August, 2021

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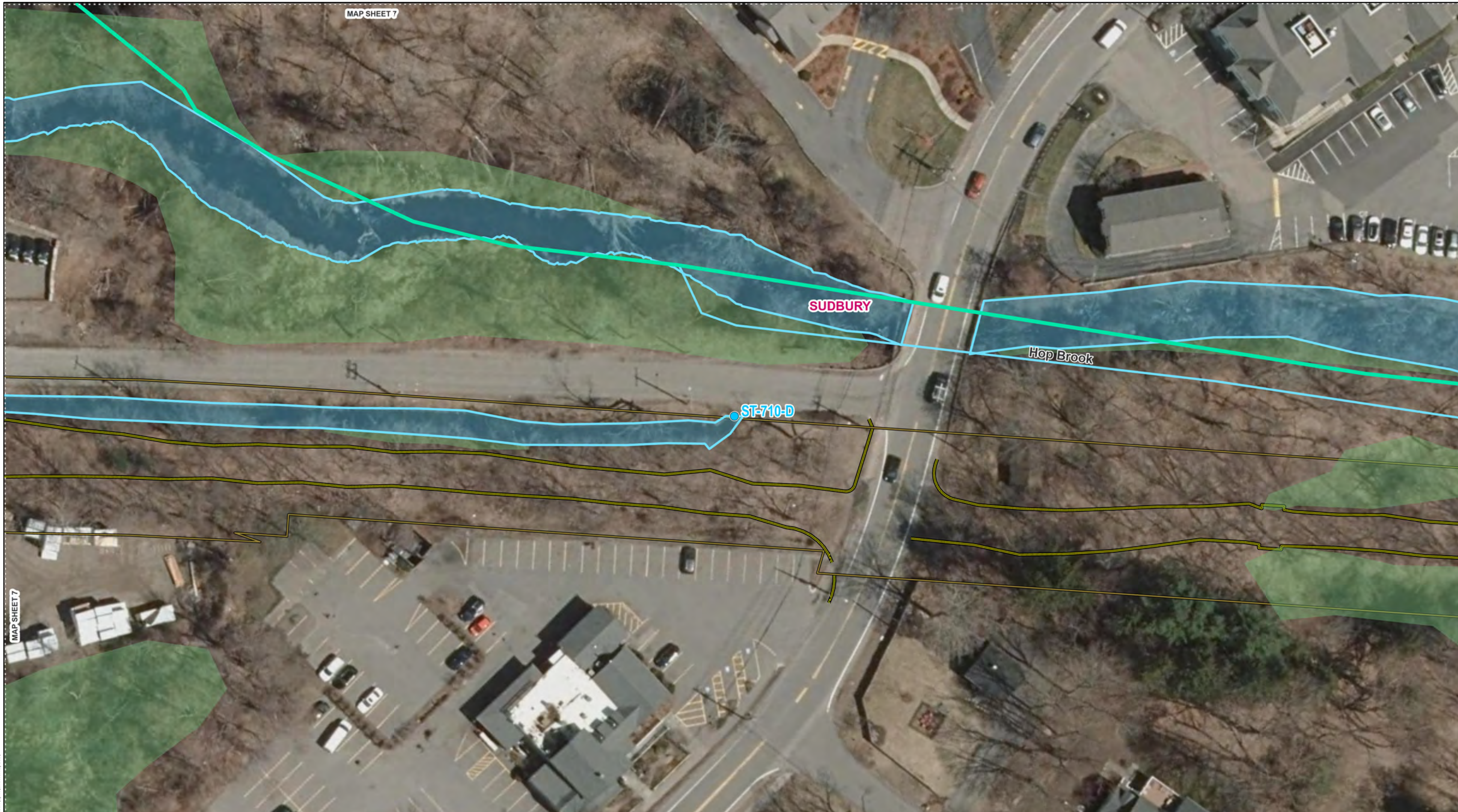

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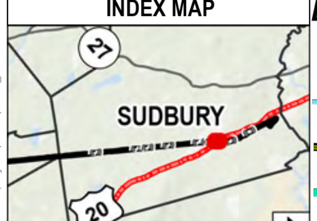

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Sudbury Hudson Reliability Project
Water Sampling Map

SUDBURY, MA

MAP SHEET 7 OF 9

Date: August, 2021

SWCA ENVIRONMENTAL CONSULTANTS

Hop Brook

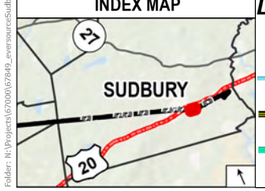
ST-725-U

ST-725-D

SUDBURY

MAP SHEET 8

INDEX MAP



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NO.	DATE	REVISIONS

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Sudbury Hudson Reliability Project
Water Sampling Map

SUDBURY, MA

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Date: August, 2021

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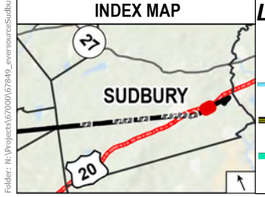
SUDBURY

ST-747-U

ST-747-D

INDEX MAP



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NO.	DATE	REVISIONS

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Sudbury Hudson Reliability Project
Water Sampling Map

SUDBURY, MA

MAP SHEET 9 OF 9

Date: August, 2021

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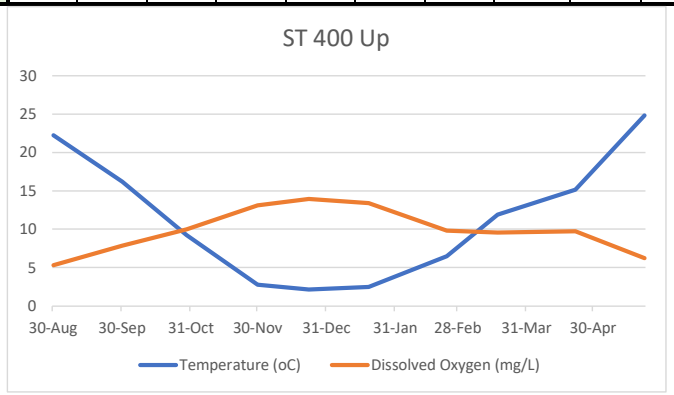
APPENDIX B

Tables

Table 3: Cold Water Fisheries Monitoring Results
Sudbury to Hudson Reliability Project

Station #	Favorable	**ST 400 UP**										**ST 400 DOWN**									
Brook/Stream/Tributary	Conditions	Hop Brook										Hop Brook									
Plan #	for	PLAN 47										PLAN 47									
Direction of Flow	Cold	south										south									
Type	Water	perennial										perennial									
Date	Fisheries	**30-Aug**	**30-Sep**	**29-Oct**	**30-Nov**	**23-Dec**	**19-Jan**	**23-Feb**	**18-Mar**	**22-Apr**	**23-May**	**30-Aug**	**30-Sep**	**29-Oct**	**30-Nov**	**23-Dec**	**19-Jan**	**23-Feb**	**18-Mar**	**22-Apr**	**23-May**
Temperature (°C)	< 20	22.25	16.20	9.23	2.77	2.16	2.48	6.48	11.88	15.15	24.82	22.25	16.17	9.22	2.74	2.12	2.47	6.45	11.85	15.16	24.78
Specific Conductance (µS/cm @ 25°C)	150-500	414	422	421	408	410	573	768	730	727	889	415	422	420	408	408	573	775	717	715	868
Specific Conductance (µS/cm)	150-500	393	351	294	235	231	327	496	547	599	880	394	351	293	235	230	327	500	537	580	865
Dissolved Oxygen (%)	nsl	62	80	87	97	101	99	80.1	88.8	97.1	74.6	60	78	86	104	105	99	83.5	87.9	93.5	75.9
Dissolved Oxygen (mg/L)	> 6	5.34	7.85	9.99	13.12	13.95	13.40	9.82	9.56	9.72	6.21	5.20	7.64	9.02	14.05	14.33	13.46	10.24	9.48	9.37	6.26
pH	6.5-8.3	6.6	6.8	6.7	6.5	6.8	7.0	7.2	7.52	8.01	7.75	6.6	6.7	6.7	6.5	6.8	7.0	7.1	7.47	7.85	7.7
ORP	nsl	91	94	93	78	104	69	156	144	137	107	91	94	93	79	117	119	159	146	142.4	103
Turbidity (NTU)	free from turbidity that would impair fish habitat	2.86	1.73	2.39	1.95	2.37	2.58	1.83	0.81	1.45	2.03	2.86	1.73	2.30	2.02	2.43	2.56	1.88	1.04	1.91	1.97
Alkalinity	< 300	40	40	0	0	0	0	100	100	100	100	40	40	0	0	0	0	100	100	100	100
Chlorine, Free	< 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chlorine, Total	< 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hardness	nsl	100	0	0	0	20	0	40	20	40	40	100	0	0	0	20	0	40	20	40	40
Velocity (ft/s)	nsl	0.35	0.38	0.4	0.28	Na	0.36	1.3	0.42	0.52	0.34	0.34	0.31	0.39	0.4	Na	0.35	1.25	0.32	0.49	0.28



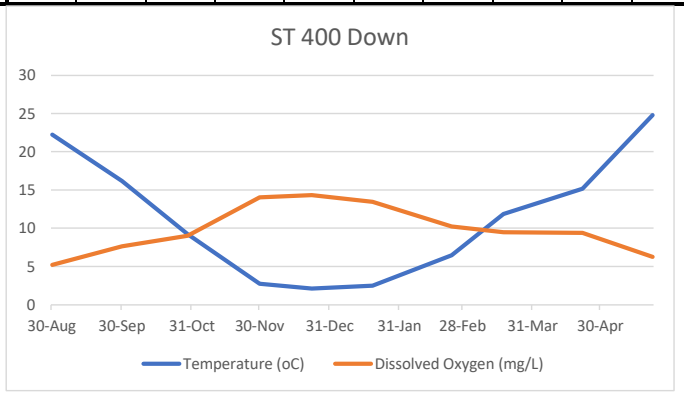
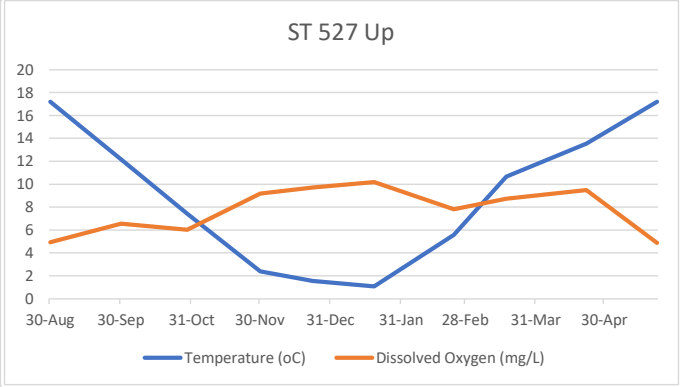


Table 3: Cold Water Fisheries Monitoring Results
Sudbury to Hudson Reliability Project

Station #	Favorable	**ST 527 UP**										**ST 527 DOWN**									
Brook/Stream/Tributary	Conditions	Unnamed Stream										Unnamed Stream									
Plan #	for	PLAN 52										PLAN 52									
Direction of Flow	Cold	south										south									
Type	Water	intermittent										intermittent									
Date	Fisheries	**30-Aug**	**30-Sep**	**29-Oct**	**30-Nov**	**23-Dec**	**19-Jan**	**23-Feb**	**18-Mar**	**22-Apr**	**23-May**	**30-Aug**	**30-Sep**	**29-Oct**	**30-Nov**	**23-Dec**	**19-Jan**	**23-Feb**	**18-Mar**	**22-Apr**	**23-May**
Temperature (°C)	< 20	17.19	12.17	7.42	2.39	1.56	1.08	5.58	10.66	13.53	17.21	17.07	12.13	7.36	2.48	1.63	1.07	5.49	10.11	13.11	17.17
Specific Conductance (µS/cm @ 25°C)	150-500	305	290	201	301	260	309	527	426	508	487	301	287	204	304	262	294	538	435	513	604
Specific Conductance (µS/cm)	150-500	259	219	148	170	144	163	332	309	397	420	255	217	154	174	145	159	337	311	396	513
Dissolved Oxygen (%)	nsl	51	61	54	67	70	72	62.4	78.8	91.3	50.5	52	64	56	67	74	74	64.6	70.9	85.3	54.5
Dissolved Oxygen (mg/L)	> 6	4.94	6.56	6.02	9.17	9.71	10.2	7.82	8.74	9.47	4.87	4.98	6.87	6.16	9.12	10.31	10.45	8.13	7.88	8.95	5.23
pH	6.5-8.3	5.4	6.1	6.3	6.3	6.0	6.0	6.2	6.37	6.42	6.62	5.8	6.5	6.4	6.4	6.2	6.0	6.2	6.38	6.48	6.58
ORP	nsl	130	117	105	97	127	97	200	186	179	119	127	106	105	96	122	81	175	178	173	123
Turbidity (NTU)	free from turbidity that would impair fish habitat	2.30	0.63	1.52	1.53	2.98	2.20	2.03	2.01	1.46	3.01	1.18	0.84	1.56	1.40	2.00	1.50	1.81	1.26	1.4	2.18
Alkalinity	< 300	0	0	0	100	0	0	0	0	0	100	0	0	0	100	0	0	0	0	0	100
Chlorine, Free	< 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chlorine, Total	< 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hardness	nsl	100	0	0	0	20	0	0	20	0	0	100	100	0	0	0	0	0	20	0	0
Velocity (ft/s)	nsl	0.2	0.18	0.1	0.21	Na	0.15	0.53	0.09	0.08	0.14	0.21	0.06	0.13	0.14	Na	0.1	0.48	0.23	0.17	0.09



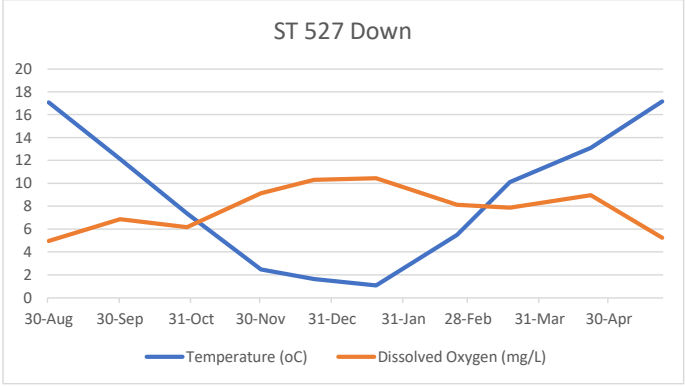
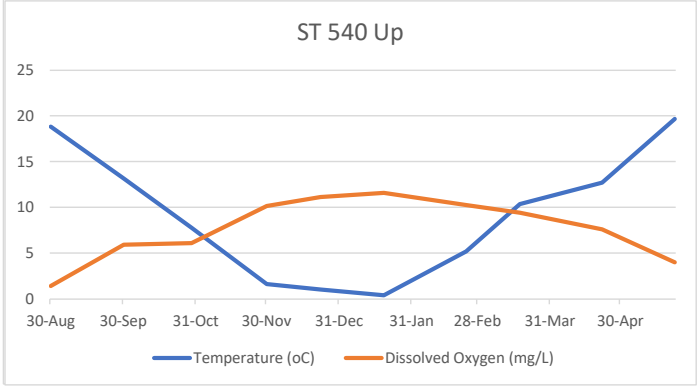


Table 3: Cold Water Fisheries Monitoring Results
Sudbury to Hudson Reliability Project

Station #	Favorable	**ST 540 UP**										**ST 540 DOWN**									
Brook/Stream/Tributary	Conditions	Dudley Brook										Dudley Brook									
Plan #	for	PLAN 54										PLAN 54									
Direction of Flow	Cold	south										south									
Type	Water	perennial										perennial									
Date	Fisheries	**30-Aug**	**30-Sep**	**29-Oct**	**30-Nov**	**23-Dec**	**19-Jan**	**23-Feb**	**18-Mar**	**22-Apr**	**23-May**	**30-Aug**	**30-Sep**	**29-Oct**	**30-Nov**	**23-Dec**	**19-Jan**	**23-Feb**	**18-Mar**	**22-Apr**	**23-May**
Temperature (°C)	< 20	18.84	13.17	7.78	1.62	1.02	0.42	5.2	10.35	12.72	19.67	18.83	13.18	7.89	1.72	0.80	0.27	5.47	10.32	13.11	19.94
Specific Conductance (µS/cm @ 25°C)	150-500	340	305	271	312	288	377	573	487	553	663	344	311	274	311	296	376	628	480	555	674
Specific Conductance (µS/cm)	150-500	300	236	182	172	157	198	360	350	423	599	303	241	184	173	159	199	394	345	429	609
Dissolved Oxygen (%)	nsl	16	56	52	73	79	80	83	84.4	70.6	42.1	42	67	59	76	88	78	74.3	77.2	86.4	46.7
Dissolved Oxygen (mg/L)	> 6	1.41	5.91	6.11	10.16	11.15	11.60	10.26	9.43	7.6	4.01	3.86	6.98	7.00	10.57	12.49	11.33	9.28	8.63	9.06	4.24
pH	6.5-8.3	6.1	6.7	6.5	6.6	6.6	7.0	6.7	6.95	6.99	7.45	6.3	6.7	6.9	6.8	6.5	7.0	6.8	7.04	7.11	7.02
ORP	nsl	123	101	101	87	106	55	162	176	168	107	115	97	101	85	103	52	137	151	128	125
Turbidity (NTU)	free from turbidity that would impair fish habitat	3.14	1.37	1.90	1.86	1.54	1.66	2.2	1.67	2	2.67	2.09	1.34	1.84	1.77	1.46	1.94	2.08	1.8	1.4	2.2
Alkalinity	< 300	40	20	0	100	0	0	100	0	100	100	40	40	0	0	0	0	0	100	100	100
Chlorine, Free	< 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chlorine, Total	< 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	<Null>	0	0
Hardness	nsl	100	0	0	0	0	0	0	20	20	40	100	0	0	0	20	0	0	20	20	40
Velocity (ft/s)	nsl	0.55	0.44	0.66	0.31	Na	0.8	0.78	0.52	1.1	0.4	0.4	0.34	0.8	0.31	Na	0.25	0.6	1.2	0.82	0.36



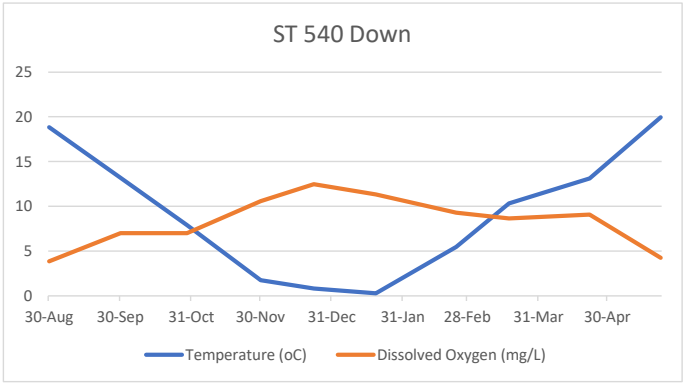
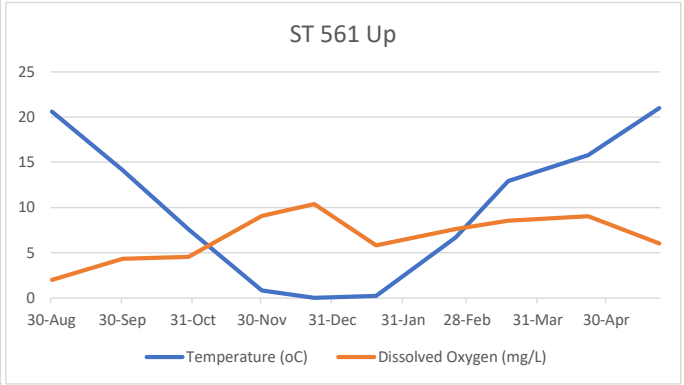


Table 3: Cold Water Fisheries Monitoring Results
Sudbury to Hudson Reliability Project

Station #	Favorable	**ST 561 UP**										**ST 561 DOWN**									
Brook/Stream/Tributary	Conditions	Unnamed Stream										Unnamed Stream									
Plan #	for	PLAN 57										PLAN 57									
Direction of Flow	Cold	north										north									
Type	Water	intermittent										intermittent									
Date	Fisheries	**30-Aug**	**30-Sep**	**29-Oct**	**30-Nov**	**23-Dec**	**19-Jan**	**23-Feb**	**18-Mar**	**22-Apr**	**23-May**	**30-Aug**	**30-Sep**	**29-Oct**	**30-Nov**	**23-Dec**	**19-Jan**	**23-Feb**	**18-Mar**	**22-Apr**	**23-May**
Temperature (°C)	< 20	20.59	14.12	7.57	0.84	0.02	0.22	6.7	12.92	15.79	21	20.14	14.10	7.61	1.17	0.19	0.27	6.79	12.42	14.56	20.3
Specific Conductance (µS/cm @ 25°C)	150-500	361	344	243	308	244	269	485	439	557	790	350	338	252	311	245	281	497	431	567	835
Specific Conductance (µS/cm)	150-500	331	272	162	166	127	141	315	337	459	678	318	268	168	168	129	149	324	327	454	750
Dissolved Oxygen (%)	nsl	22	42	38	64	71	40	62.4	80.8	91.3	62.5	37	62	62	76	85	44	63.6	74.4	85	67.8
Dissolved Oxygen (mg/L)	> 6	2.00	4.32	4.53	9.07	10.4	5.81	7.6	8.53	9.03	6.01	3.36	5.34	7.28	10.78	12.28	6.29	7.74	7.93	8.61	6.4
pH	6.5-8.3	6.1	6.7	6.4	6.9	6.6	6.7	6.8	7.08	7.35	7.45	6.7	7.0	7.3	7.2	6.5	6.7	6.9	7.1	7.26	7.45
ORP	nsl	47	78	73	72	99	68	147	98	94	89	53	70	52	46	79	95	131	116	92.2	48
Turbidity (NTU)	free from turbidity that would impair fish habitat	5.74	1.40	2.16	1.72	1.44	1.70	1.58	3.28	1.94	3.2	1.87	1.90	3.27	1.90	1.73	1.67	1.89	1.85	2.3	4.2
Alkalinity	< 300	40	40	40	0	0	0	100	100	100	100	40	40	40	100	0	0	0	100	100	100
Chlorine, Free	< 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chlorine, Total	< 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hardness	nsl	100	100	0	0	40	0	40	20	40	40	100	100	0	40	0	0	0	20	20	40
Velocity (ft/s)	nsl	0.08	0.06	0.19	0.16	Na	0.04	0.15	0.31	0.18	0.17	0.1	0.13	0.45	0.37	Na	0.04	0.28	0.12	0.2	0.12



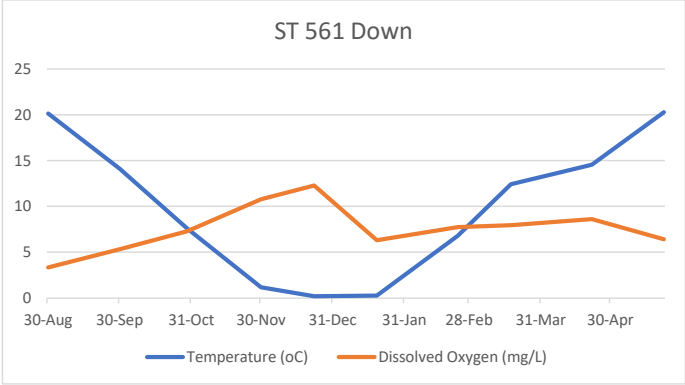
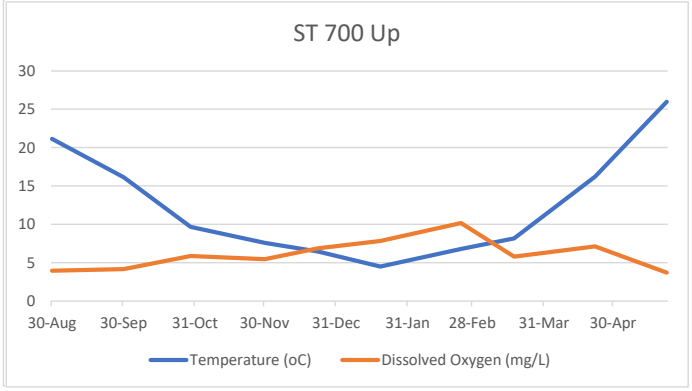


Table 3: Cold Water Fisheries Monitoring Results
Sudbury to Hudson Reliability Project

Station #	Favorable	**ST 593 UP**										**ST 593 DOWN**									
Brook/Stream/Tributary	Conditions	Unnamed Stream										Unnamed Stream									
Plan #	for	PLAN 60										PLAN 60									
Direction of Flow	Cold	north										north									
Type	Water	intermittent										intermittent									
Date	Fisheries	**30-Aug**	**30-Sep**	**29-Oct**	**30-Nov**	**23-Dec**	**19-Jan**	**23-Feb**	**18-Mar**	**22-Apr**	**23-May**	**30-Aug**	**30-Sep**	**29-Oct**	**30-Nov**	**23-Dec**	**19-Jan**	**23-Feb**	**18-Mar**	**22-Apr**	**23-May**
Temperature (^{o}C)	< 20	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry
Specific Conductance (µS/cm @ 25^{o}C)	150-500	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry
Specific Conductance (µS/cm)	150-500	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry
Dissolved Oxygen (%)	nsl	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry
Dissolved Oxygen (mg/L)	> 6	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry
pH	6.5-8.3	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry
ORP	nsl	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry
Turbidity (NTU)	free from turbidity that would impair fish habitat	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry
Alkalinity	< 300	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry
Chlorine, Free	< 4	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry
Chlorine, Total	< 4	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry
Hardness	nsl	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry
Velocity (ft/s)	nsl	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry

Table 3: Cold Water Fisheries Monitoring Results
Sudbury to Hudson Reliability Project

Station #	Favorable	**ST 700 UP**										**ST 710 DOWN**									
Brook/Stream/Tributary	Conditions	Hop Brook Tributary										Hop Brook Tributary									
Plan #	for	PLAN 61										PLAN 63									
Direction of Flow	Cold	East										East									
Type	Water	intermittent										intermittent									
Date	Fisheries	**30-Aug**	**30-Sep**	**29-Oct**	**30-Nov**	**23-Dec**	**19-Jan**	**23-Feb**	**18-Mar**	**22-Apr**	**23-May**	**30-Aug**	**30-Sep**	**29-Oct**	**30-Nov**	**23-Dec**	**19-Jan**	**23-Feb**	**18-Mar**	**22-Apr**	**23-May**
Temperature (°C)	< 20	21.13	16.14	9.67	7.56	6.43	4.49	6.79	8.15	16.21	26	21.08	14.28	9.55	0.40	0.01	frozen	8.55	11.06	15.44	24
Specific Conductance (µS/cm @ 25°C)	150-500	1362	1129	1104	1110	1079	1689	2225	3094	2398	10112	1122	755	927	1054	1108	frozen	2215	3268	2228	10068
Specific Conductance (µS/cm)	150-500	1263	938	702	742	697	1027	1450	2098	1909	9978	1039	600	653	559	580	frozen	1520	2409	1822	9630
Dissolved Oxygen (%)	nsl	43	41	52	51	56	61	84.2	49.6	76.3	39.5	37	49	61	59	73	frozen	54.8	57.4	82.5	46.8
Dissolved Oxygen (mg/L)	> 6	3.96	4.13	5.87	5.45	6.88	7.84	10.19	5.78	7.11	3.7	3.30	4.97	6.87	8.52	10.51	frozen	6.35	6.25	8.18	4.2
pH	6.5-8.3	6.5	6.9	6.8	6.6	6.4	6.4	6.8	6.82	7.1	7.8	6.8	6.9	6.8	6.5	6.5	frozen	6.8	6.94	7.3	7.6
ORP	nsl	62	10	20	29	15	70	56.3	55	65	20	66	51	25	72	60	frozen	92.4	98	79	10
Turbidity (NTU)	free from turbidity that would impair fish habitat	20.90	12.09	8.17	14.70	7.59	3.76	6.34	12.8	15	7.2	11.50	9.48	6.62	6.00	3.82	frozen	3.98	7.25	23	5.7
Alkalinity	< 300	40	80	40	250	0	100	250	250	100	250	100	120	40	100	0	frozen	100	250	100	100
Chlorine, Free	< 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	frozen	0	0	0	0
Chlorine, Total	< 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	frozen	0	0	0	0
Hardness	nsl	100	100	100	80	40	40	40	80	40	40	100	100	100	40	20	frozen	40	40	40	40
Velocity (ft/s)	nsl	0.23	0.02	0.05	0.01	Na	0.02	0.1	0.05	0.00	0.03	0.08	0.02	0.07	0.02	Na	frozen	0.18	0.2	0.02	0.08



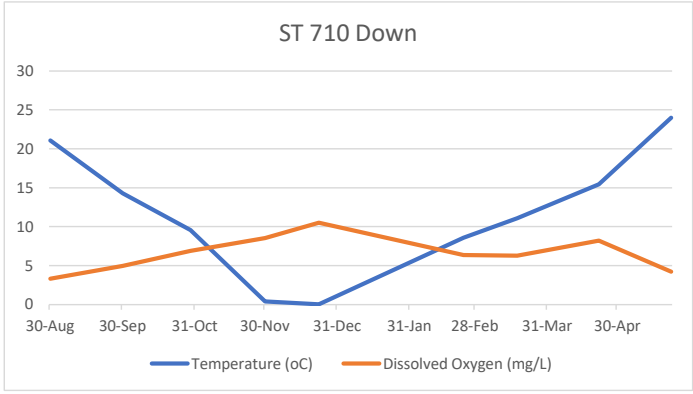
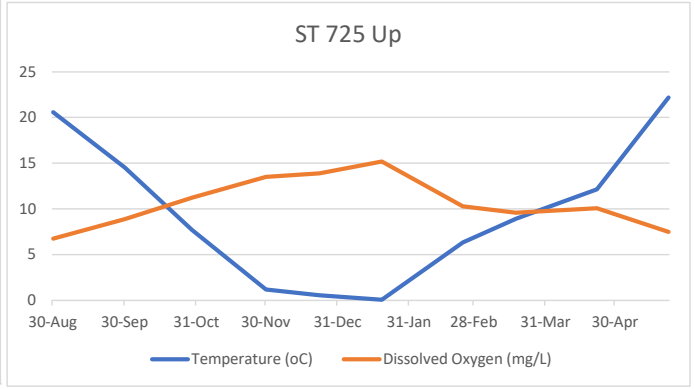


Table 3: Cold Water Fisheries Monitoring Results
Sudbury to Hudson Reliability Project

Station #	Favorable	**ST 725 UP**										**ST 725 DOWN**									
Brook/Stream/Tributary	Conditions	Hop Brook										Hop Brook									
Plan #	for	PLAN 65										PLAN 65									
Direction of Flow	Cold	south										south									
Type	Water	perennial										perennial									
Date	Fisheries	**30-Aug**	**30-Sep**	**29-Oct**	**30-Nov**	**23-Dec**	**19-Jan**	**23-Feb**	**18-Mar**	**22-Apr**	**23-May**	**30-Aug**	**30-Sep**	**29-Oct**	**30-Nov**	**23-Dec**	**19-Jan**	**23-Feb**	**18-Mar**	**22-Apr**	**23-May**
Temperature (°C)	< 20	20.55	14.52	7.67	1.17	0.54	0.05	6.3	8.9	12.12	22.2	20.49	14.45	7.63	1.13	0.51	0.06	4.91	8.81	12.17	22.14
Specific Conductance (µS/cm @ 25°C)	150-500	393	355	380	309	358	487	789	653	726	817	399	360	378	324	358	487	777	658	719	833
Specific Conductance (µS/cm)	150-500	360	284	254	168	190	255	507	452	548	773	365	287	253	176	190	255	479	455	543	788
Dissolved Oxygen (%)	nsl	75	87	94	95	97	105	82.8	83	94	85.9	80	79	100	102	101	106	74	81.5	93	87
Dissolved Oxygen (mg/L)	> 6	6.74	8.87	11.23	13.48	13.89	15.20	10.29	9.56	10.07	7.47	7.20	8.00	11.88	14.37	14.52	15.39	9.44	9.45	9.95	7.57
pH	6.5-8.3	6.8	7.0	6.9	7.1	7.2	7.4	7.2	7.49	7.75	7.89	7.2	7.0	7.1	7.2	7.2	7.3	7.1	7.6	7.78	7.98
ORP	nsl	97	96	88	81	94	35	88.5	121	116	91	98	98	80	76	92	29	128	124	122.2	89
Turbidity (NTU)	free from turbidity that would impair fish habitat	2.62	2.15	2.62	2.42	2.25	2.21	2.07	1.86	0.78	3.1	2.63	2.19	3.05	2.25	2.21	2.40	2.76	1.19	0.94	3.22
Alkalinity	< 300	40	0	0	100	0	0	0	100	100	100	40	0	0	100	0	0	100	100	100	100
Chlorine, Free	< 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chlorine, Total	< 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hardness	nsl	100	0	0	40	0	0	0	20	40	40	100	0	0	0	0	0	0	20	40	40
Velocity (ft/s)	nsl	0.23	0.15	0.51	0.23	Na	0.46	0.34	0.57	0.38	0.2	0.08	0.13	0.17	0.28	Na	0.3	0.28	0.25	0.35	0.27



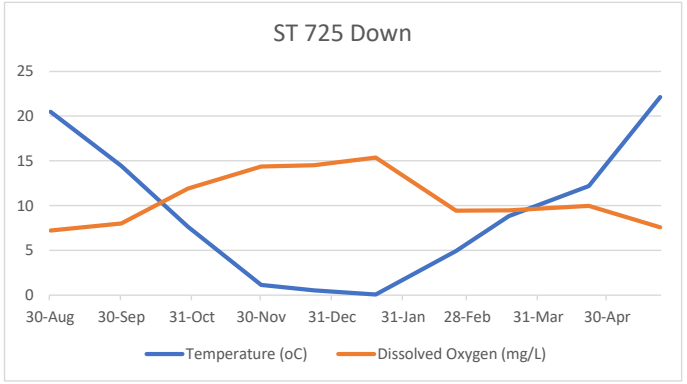
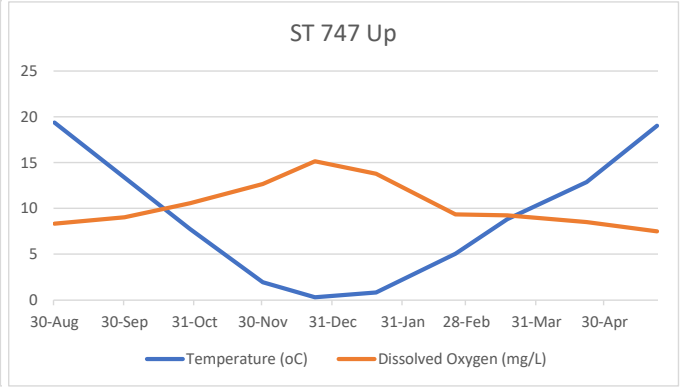
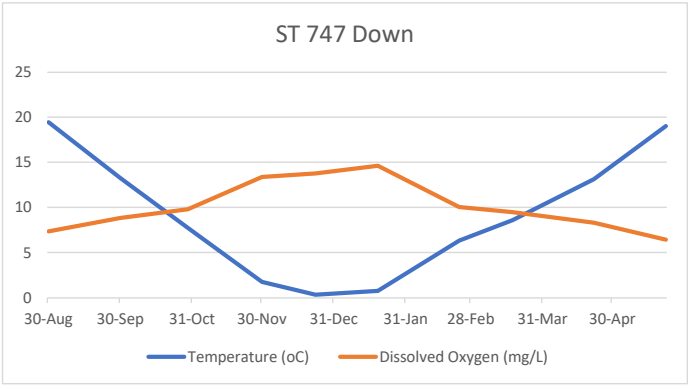


Table 3: Cold Water Fisheries Monitoring Results
Sudbury to Hudson Reliability Project

Station #	Favorable	**ST 747 UP**										**ST 747 DOWN**									
Brook/Stream/Tributary	Conditions	Wash Brook Tributary										Wash Brook Tributary									
Plan #	for	PLAN 67										PLAN 67									
Direction of Flow	Cold	south										south									
Type	Water	intermittent										intermittent									
Date	Fisheries	**30-Aug**	**30-Sep**	**29-Oct**	**30-Nov**	**23-Dec**	**19-Jan**	**23-Feb**	**18-Mar**	**22-Apr**	**23-May**	**30-Aug**	**30-Sep**	**29-Oct**	**30-Nov**	**23-Dec**	**19-Jan**	**23-Feb**	**18-Mar**	**22-Apr**	**23-May**
Temperature (°C)	< 20	19.39	13.34	7.72	1.94	0.32	0.83	5.04	8.81	12.86	19.02	19.45	13.26	7.76	1.75	0.33	0.76	6.31	8.59	13.12	19.03
Specific Conductance (µS/cm @ 25°C)	150-500	524	418	379	451	377	530	774	626	798	826	495	451	382	453	403	532	803	643	795	875
Specific Conductance (µS/cm)	150-500	468	325	254	252	200	286	473	432	612	730	443	350	256	252	213	285	516	441	614	775
Dissolved Oxygen (%)	nsl	91	86	89	92	107	97	73.5	79.6	80.5	72.5	80	85	82	96	95	103	81.8	81.6	79.5	69.8
Dissolved Oxygen (mg/L)	> 6	8.32	9.02	10.57	12.66	15.15	13.77	9.33	9.23	8.5	7.49	7.36	8.85	9.79	13.37	13.79	14.63	10.06	9.49	8.33	6.45
pH	6.5-8.3	7.2	7.0	6.6	7.2	7.2	7.4	7.15	7.55	7.5	7.4	7.0	6.8	6.5	7.3	7.1	7.8	7.07	7.77	7.55	7.58
ORP	nsl	58	60	80	59	76	-15	124	98	92	101	73	75	84	57	82	21	25.5	106	94	91.1
Turbidity (NTU)	free from turbidity that would impair fish habitat	0.72	1.15	1.88	1.69	1.58	2.17	3.32	1.28	1.29	2.6	0.79	1.87	1.81	1.82	1.77	2.27	2.21	1.56	1.11	2.9
Alkalinity	< 300	80	40	40	100	0	0	100	100	100	100	80	40	40	100	0	0	0	100	100	100
Chlorine, Free	< 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chlorine, Total	< 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hardness	nsl	100	100	100	40	20	40	40	40	40	40	100	100	100	40	40	40	0	40	40	40
Velocity (ft/s)	nsl	0.24	0.23	0.35	0.33	Na	0.1	0.36	0.43	0.55	0.19	0.07	0.1	0.2	0.17	Na	0.06	0.39	0.31	0.46	0.22





APPENDIX C

Field Logs

	Summary of Field Monitoring (pg 1/3)									
	Mar-22									
Stream Point ID	**Station Number**	**Weather**	**AirTemp**	**Technician**	**Date**	**Upgradient or Downgradient**	**Flow Appearance**	**Flow_Odor**	**Location**	**Sampling Site**
ST 400 down	Hop brook	partly_cloudy	72	ALH	3/18/2022	Downgradient	clear	none	From Bridge	Open Channel
ST 400 up	Hop Brook	partly_cloudy	72	ALH	3/18/2022	Upgradient	clear	none	From Bridge	Open Channel
ST 527 down	Unnamed	partly_cloudy	72	ALH	3/18/2022	Downgradient	dark_tea	none	From Headwall	Open Channel
ST 527 up	Unnamed	partly_cloudy	72	ALH	3/18/2022	Upgradient	light_tea	none	From Headwall	Open Channel
ST 540 down	Dudley Brook	sunny	72	ALH	3/18/2022	Downgradient	light_tea	none	From Headwall	Open Channel
ST 540 up	Dudley brook	sunny	72	ALH	3/18/2022	Upgradient	light_tea	none	From Headwall	Open Channel
ST 561 down	Unnamed	sunny	70	ALH	3/18/2022	Downgradient	clear	none	From Bank	Open Channel
ST 561 up	Unnamed	sunny	70	ALH	3/18/2022	Upgradient	clear	none	From Headwall	Open Channel
ST 593 down	Unnamed	Ns	Ns	ALH	3/18/2022	Ns	Ns	Ns	Ns	Ns
ST 593 up	Unnamed	Ns	Ns	ALH	3/18/2022	Ns	Ns	Ns	Ns	Ns
ST 700 up	Hop Brook tributary	sunny	60	ALH	3/18/2022	Upgradient	cloudy_milky	rotten_eggs	From Headwall	Open Channel
ST 710 down	Hop brook tributary	<Null>	60	ALH	3/18/2022	Downgradient	cloudy_milky	none	From Headwall	Open Channel
ST 725 Up	Hop Brook	sunny	57	ALH	3/18/2022	Upgradient	light_tea	none	From Bridge	Open Channel
ST 725-D	Hop Brook	sunny	60	ALH	3/18/2022	Downgradient	clear	none	From Bridge	Open Channel
ST 747 Down	Wash brook tributary	sunny	56	ALH	3/18/2022	Downgradient	clear	none	From Bank	Open Channel
ST 747-U	Wash brook tributary	sunny	56	ALH	3/18/2022	Upgradient	clear	none	From Bank	Open Channel

	Summary of Field Monitoring (pg2/3)							
	Mar-22							
Stream Point ID	**Signs of Flow**	**Floatables**	**Condition of Bottom**	**Survey Comments**	**Water Temperature**	**Specific Conductance µS/cm @ 25 Degrees**	**Specific Conductance µS/cm**	**Dissolved Oxygen %**
ST 400 down	Present-Fast	None	sandy	<Null>	11.85	717	537	87.9
ST 400 up	Present-Fast	None	sandy	<Null>	11.88	730	547	88.8
ST 527 down	Present-Slow	None	sandy	<Null>	10.11	435	311	70.9
ST 527 up	Present-Slow	None	mud_clay	Culvert top below water elevation	10.66	426	309	78.8
ST 540 down	Present-Fast	Foam	not_visible	<Null>	10.32	480	345	77.2
ST 540 up	Present-Fast	None	not_visible	<Null>	10.35	487	350	84.4
ST 561 down	Present-Slow	None	gravel	<Null>	12.42	431	327	74.4
ST 561 up	Present-Slow	None	sandy	<Null>	12.92	439	337	80.8
ST 593 down	Ns	Ns	Ns	Ns	Ns	Ns	Ns	Ns
ST 593 up	Ns	Ns	Ns	Ns	Ns	Ns	Ns	Ns
ST 700 up	Not Seen	Debris_buildup,Floating_Solids,Foam,Iron_Bacteria,Trash	not_visible	Lots of trash needs cleaning	8.15	3094	2098	49.6
ST 710 down	Present-Slow	Iron_Bacteria,Floating_Solids	mud_clay	Kind of clear but scummy	11.06	3268	2409	57.4
ST 725 Up	Present-Fast	Debris_buildup,Floating_Solids,Foam,Trash	sandy	<Null>	8.9	653	452	83
ST 725-D	Present-Fast	None	sandy	<Null>	8.81	658	455	81.5
ST 747 Down	Present-Slow	None	sandy	<Null>	8.59	643	441	81.6
ST 747-U	Present-Slow	None	sandy	<Null>	8.81	626	432	79.6

	Summary of Field Monitoring (pg 3/3)								
	Mar-22								
Stream Point ID	**Dissolved Oxygen mg/L**	**pH**	**ORP**	**Turbidity (NTU)**	**Hardness**	**Chlorine_Free**	**Chlorine_Total**	**Alkalinity**	**Velocity (ft/s)**
ST 400 down	9.48	7.47	146	1.04	100	0	0	20	0.32
ST 400 up	9.56	7.52	144	0.81	100	0	0	20	0.42
ST 527 down	7.88	6.38	178	1.26	0	0	0	20	0.23
ST 527 up	8.74	6.37	186	2.01	0	0	0	20	0.09
ST 540 down	8.63	7.04	151	1.8	100	0	<Null>	20	1.2
ST 540 up	9.43	6.95	176	1.67	0	0	0	20	0.52
ST 561 down	7.93	7.1	116	1.85	100	0	0	20	0.12
ST 561 up	8.53	7.08	98	3.28	100	0	0	20	0.31
ST 593 down	Ns	Ns	Ns	Ns	Ns	Ns	Ns	Ns	Ns
ST 593 up	Ns	Ns	Ns	Ns	Ns	Ns	Ns	Ns	Ns
ST 700 up	5.78	6.82	55	12.8	250	0	0	80	0.05
ST 710 down	6.25	6.94	98	7.25	250	0	0	40	0.2
ST 725 Up	9.56	7.49	121	1.86	100	0	0	20	0.57
ST 725-D	9.45	7.6	124	1.19	100	0	0	20	0.25
ST 747 Down	9.49	7.77	106	1.56	100	0	0	40	0.31
ST 747-U	9.23	7.55	98	1.28	100	0	0	40	0.43

	Summary of Field Monitoring (pg 1/3)									
	Apr-22									
Stream Point ID	**Station Number**	**Weather**	**AirTemp**	**Technician**	**Date**	**Upgradient or Downgradient**	**Flow Appearance**	**Flow_Odor**	**Location**	**Sampling Site**
ST 400 down	Hop brook	sunny	63	ALH	4/22/2022	Downgradient	light_tea	none	From Bridge	Open Channel
ST 400 up	Hop Brook	sunny	63	ALH	4/22/2022	Upgradient	clear	none	From Bridge	Open Channel
ST 527 down	Unnamed	sunny	63	ALH	4/22/2022	Downgradient	light_tea	none	From Headwall	Open Channel
ST 527 up	Unnamed	sunny	63	ALH	4/22/2022	Upgradient	light_tea	none	From Headwall	Open Channel
ST 540 down	Dudley Brook	sunny	63	ALH	4/22/2022	Downgradient	clear	none	From Headwall	Open Channel
ST 540 up	Dudley brook	sunny	63	ALH	4/22/2022	Upgradient	dark_tea	none	From Headwall	Open Channel
ST 561 down	Unnamed	sunny	63	ALH	4/22/2022	Downgradient	clear	none	From Bank	Open Channel
ST 561 up	Unnamed	sunny	63	ALH	4/22/2022	Upgradient	clear	none	From Headwall	Open Channel
ST 593 down	Unnamed	Ns	Ns	ALH	4/22/2022	Ns	Ns	Ns	Ns	Ns
ST 593 up	Unnamed	Ns	Ns	ALH	4/22/2022	Ns	Ns	Ns	Ns	Ns
ST 700 up	Hop Brook tributary	sunny	63	ALH	4/22/2022	Upgradient	cloudy_milky	none	From Headwall	Open Channel
ST 710 down	Hop brook tributary	sunny	63	ALH	4/22/2022	Downgradient	cloudy_milky	none	From Headwall	Open Channel
ST 725 Up	Hop Brook	sunny	63	ALH	4/22/2022	Downgradient	clear	none	From Bridge	Open Channel
ST 725-D	Hop Brook	sunny	63	ALH	4/22/2022	Upgradient	light_tea	none	From Bridge	Open Channel
ST 747 Down	Wash brook tributary	sunny	63	ALH	4/22/2022	Downgradient	clear	none	From Bank	Open Channel
ST 747-U	Wash brook tributary	sunny	63	ALH	4/22/2022	Upgradient	clear	none	From Bank	Open Channel

	Summary of Field Monitoring (pg2/3)							
	Apr-22							
Stream Point ID	**Signs of Flow**	**Floatables**	**Condition of Bottom**	**Survey Comments**	**Water Temperature**	**Specific Conductance µS/cm @ 25 Degrees**	**Specific Conductance µS/cm**	**Dissolved Oxygen %**
ST 400 down	Present-Fast	None	sandy	<Null>	15.16	715	580	93.5
ST 400 up	Present-Fast	Debris_buildup	sandy	<Null>	15.15	727	599	97.1
ST 527 down	Present-Slow	None	gravel	<Null>	13.11	513	396	85.3
ST 527 up	Present-Slow	Foam,Debris_buildup,Floating_Solids	gravel	Top of water above top of culvert. Impeding flow	13.53	508	397	91.3
ST 540 down	Present-Fast	None	gravel	<Null>	13.11	555	429	86.4
ST 540 up	Present-Fast	None	not_visible	<Null>	12.72	553	423	70.6
ST 561 down	Present-Slow	None	gravel	<Null>	14.56	567	454	85
ST 561 up	Present-Slow	None	mud_clay	<Null>	15.79	557	459	91.3
ST 593 down	Ns	Ns	Ns	Ns	Ns	Ns	Ns	Ns
ST 593 up	Ns	Ns	Ns	Ns	Ns	Ns	Ns	Ns
ST 700 up	No Flow	Debris_buildup,Floating_Solids,Foam,Trash	not_visible	no flow, only trickle	16.21	2398	1909	76.3
ST 710 down	Present-Slow	Iron_Bacteria	mud_clay	Iron bacteria on bottom	15.44	2228	1822	82.5
ST 725 Up	Present-Fast	None	not_visible	<Null>	12.12	726	548	94
ST 725-D	Present-Fast	Debris_buildup,Floating_Solids,Foam,Trash	not_visible	<Null>	12.17	719	543	93
ST 747 Down	Present-Slow	None	sandy	<Null>	12.86	798	612	80.5
ST 747-U	Present-Slow	None	sandy	<Null>	A	795	614	79.5

	Summary of Field Monitoring (pg 3/3)								
	Apr-22								
Stream Point ID	**Dissolved Oxygen mg/L**	**pH**	**ORP**	**Turbidity (NTU)**	**Hardness**	**Chlorine_Free**	**Chlorine_Total**	**Alkalinity**	**Velocity (ft/s)**
ST 400 down	9.37	7.85	142.4	1.91	100	0	0	40	0.49
ST 400 up	9.72	8.01	137	1.45	100	0	0	40	0.52
ST 527 down	8.95	6.48	173	1.4	0	0	0	0	0.17
ST 527 up	9.47	6.42	179	1.46	0	0	0	0	0.08
ST 540 down	9.06	7.11	128	1.4	100	0	0	20	0.82
ST 540 up	7.6	6.99	168	2	100	0	0	20	1.1
ST 561 down	8.61	7.26	92.2	2.3	100	0	0	20	0.2
ST 561 up	9.03	7.35	94	1.94	100	0	0	40	0.18
ST 593 down	Ns	Ns	Ns	Ns	Ns	Ns	Ns	Ns	Ns
ST 593 up	Ns	Ns	Ns	Ns	Ns	Ns	Ns	Ns	Ns
ST 700 up	7.11	7.1	65	15	100	0	0	40	0.00
ST 710 down	8.18	7.3	79	23	100	0	0	40	0.02
ST 725 Up	10.07	7.75	116	0.78	100	0	0	40	0.38
ST 725-D	9.95	7.78	122.2	0.94	100	0	0	40	0.35
ST 747 Down	8.5	7.5	92	1.29	100	0	0	40	0.55
ST 747-U	8.33	7.55	94	1.11	100	0	0	40	0.46

	Summary of Field Monitoring (pg 1/3)									
	May-22									
Stream Point ID	**Station Number**	**Weather**	**AirTemp**	**Technician**	**Date**	**Upgradient or Downgradient**	**Flow Appearance**	**Flow_Odor**	**Location**	**Sampling Site**
ST 400 down	Hop brook	sunny	70	ALH	5/23/2022	Downgradient	clear	none	From Bridge	Open Channel
ST 400 up	Hop Brook	sunny	70	ALH	5/23/2022	Upgradient	clear	none	From Bridge	Open Channel
ST 527 down	Unnamed	sunny	70	ALH	5/23/2022	Downgradient	dark_tea	none	From Headwall	Open Channel
ST 527 up	Unnamed	sunny	70	ALH	5/23/2022	Upgradient	dark_tea	none	From Headwall	Open Channel
ST 540 down	Dudley Brook	sunny	70	ALH	5/23/2022	Downgradient	clear	none	From Headwall	Open Channel
ST 540 up	Dudley brook	sunny	70	ALH	5/23/2022	Upgradient	cloudy_milky	none	From Headwall	Open Channel
ST 561 down	Unnamed	sunny	70	ALH	5/23/2022	Downgradient	light_tea	none	From Bank	Open Channel
ST 561 up	Unnamed	sunny	70	ALH	5/23/2022	Upgradient	light_tea	none	From Headwall	Open Channel
ST 593 down	Unnamed	Ns	Ns	ALH	5/23/2022	Ns	Ns	Ns	Ns	Ns
ST 593 up	Unnamed	Ns	Ns	ALH	5/23/2022	Ns	Ns	Ns	Ns	Ns
ST 700 up	Hop Brook tributary	sunny	70	ALH	5/23/2022	Upgradient	cloudy_milky	rotten_eggs	From Headwall	Open Channel
ST 710 down	Hop brook tributary	sunny	70	ALH	5/23/2022	Downgradient	cloudy_milky	none	From Headwall	Open Channel
ST 725 Up	Hop Brook	sunny	70	ALH	5/23/2022	Upgradient	cloudy_milky	none	From Bridge	Open Channel
ST 725-D	Hop Brook	sunny	70	ALH	5/23/2022	Downgradient	cloudy_milky	none	From Bridge	Open Channel
ST 747 Down	Wash brook tributary	sunny	70	ALH	5/23/2022	Downgradient	clear	none	From Bank	Open Channel
ST 747-U	Wash brook tributary	sunny	70	ALH	5/23/2022	Upgradient	clear	none	From Headwall	Open Channel

	Summary of Field Monitoring (pg2/3)							
	May-22							
Stream Point ID	**Signs of Flow**	**Floatables**	**Condition of Bottom**	**Survey Comments**	**Water Temperature**	**Specific Conductance µS/cm @ 25 Degrees**	**Specific Conductance µS/cm**	**Dissolved Oxygen %**
ST 400 down	Present-Fast	None	sandy	<Null>	24.78	868	865	75.9
ST 400 up	Present-Fast	Iron_Bacteria	sandy	<Null>	24.82	889	880	74.6
ST 527 down	Present-Slow	Iron_Bacteria,Floating_Solids	not_visible	Aquatic vegetation	17.17	604	513	54.5
ST 527 up	Present-Slow	Floating_Solids,Iron_Bacteria	not_visible	Aquatic vegetation	17.21	487	420	50.5
ST 540 down	Present-Fast	Foam	gravel	<Null>	19.94	674	609	46.7
ST 540 up	Present-Fast	Debris_buildup,Iron_Bacteria	gravel	<Null>	19.67	663	599	42.1
ST 561 down	Present-Slow	Iron_Bacteria	sandy	<Null>	20.3	835	750	67.8
ST 561 up	Present-Slow	None	sandy	<Null>	21	790	678	62.5
ST 593 down	Ns	Ns	Ns	Ns	Ns	Ns	Ns	Ns
ST 593 up	Ns	Ns	Ns	Ns	Ns	Ns	Ns	Ns
ST 700 up	Not Seen	Iron_Bacteria, Foam, Floating_Solids, Debris_buildup, Trash	not_visible	<Null>	26	10112	9978	39.5
ST 710 down	Present-Slow	Iron_Bacteria	not_visible	Aquatic vegetation	24	10068	9630	46.8
ST 725 Up	Present-Slow	Oil_Sheen, Iron_Bacteria, Debris_buildup, Floating_Solids, Trash	not_visible	<Null>	22.2	817	773	85.9
ST 725-D	Present-Slow	None	not_visible	<Null>	22.14	833	788	87
ST 747 Down	Present-Slow	None	sandy	<Null>	19.03	875	775	69.8
ST 747-U	Present-Slow	None	sandy	<Null>	19.02	826	730	72.5

	Summary of Field Monitoring (pg 3/3)								
	May-22								
Stream Point ID	**Dissolved Oxygen mg/L**	**pH**	**ORP**	**Turbidity (NTU)**	**Hardness**	**Chlorine_Free**	**Chlorine_Total**	**Alkalinity**	**Velocity (ft/s)**
ST 400 down	6.26	7.7	103	1.97	100	0	0	40	0.28
ST 400 up	6.21	7.75	107	2.03	100	0	0	40	0.34
ST 527 down	5.23	6.58	123	2.18	100	0	0	0	0.09
ST 527 up	487	6.62	119	3.01	100	0	0	0	0.14
ST 540 down	4.24	7.02	125	2.2	100	0	0	40	0.36
ST 540 up	4.01	7.45	107	2.67	100	0	0	40	0.4
ST 561 down	6.4	7.45	48	4.2	100	0	0	40	0.12
ST 561 up	6.01	7.45	89	3.2	100	0	0	40	0.17
ST 593 down	Ns	Ns	Ns	Ns	Ns	Ns	Ns	Ns	Ns
ST 593 up	Ns	Ns	Ns	Ns	Ns	Ns	Ns	Ns	Ns
ST 700 up	3.7	7.8	20	7.2	250	0	0	40	0.03
ST 710 down	4.2	7.6	10	5.7	100	0	0	40	0.08
ST 725 Up	7.47	7.89	91	3.1	100	0	0	40	0.2
ST 725-D	7.57	7.98	89	3.22	100	0	0	40	0.27
ST 747 Down	6.45	7.58	91.1	2.9	100	0	0	40	0.22
ST 747-U	7.49	7.4	101	2.6	100	0	0	40	0.19