



# Results of the Water Quality Monitoring Program for Coldwater Fisheries

## Sudbury to Hudson Reliability Project

### February 2023 – April 2023

JUNE 2023

PREPARED FOR  
**Eversource Energy**

PREPARED BY  
**SWCA Environmental Consultants**

**RESULTS OF THE WATER QUALITY MONITORING  
PROGRAM FOR COLDWATER FISHERIES  
SUDBURY TO HUDSON RELIABILITY PROJECT  
FEBRUARY 2023 – APRIL 2023**

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SWCA Project No. 67849

June 2023

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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 <sup>1</sup>	Favorable Ranges for Cold Water Fisheries
Temperature	below 20°C (up to 26°C 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 <sup>1</sup>	150 - 500 µS/cm
Turbidity <sup>2</sup>	"free from turbidity that would impair fish habitat"
Chlorine <sup>3</sup>	<4 mg/L
Alkalinity <sup>4,5</sup>	< 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.

During this quarterly monitoring period (February 2023 to April 2023) SWCA monitored these eight locations on February 24, March 24, and April 20, 2023. Earth disturbance activities began near the monitoring points beginning in January 2023 and continuing into late winter and spring months. All crossings were observed to be flowing to some extent during at least one of those monitoring events with the exception of the unnamed stream at station 593+18, which has never been observed to be flowing since the initial survey was conducted. Temperature and dissolved oxygen can change naturally when the sun rises and enables aquatic plants to release more oxygen. Later winter and early spring months temperatures begin to warm allowing the surface water temperatures to become warmer with the rising air temperatures. 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. 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**

Temperature of the surface water in the winter month of February was lower than previous months. Spring months of March and April were higher than the previous months and all were below 20 degrees Celsius. During these sampling months, many of the monitoring points were colder in February compared to previous winter months. However, sampling points in the spring months began to increase due to the spring rainfall and warmer ambient air temperatures.

The monitoring results show that in February water temperatures ranged from 0.84-2.82 degrees Celsius. The March water temperatures fluctuated from 8.89-10.96 degrees Celsius. Water temperature monitoring results in the month of April ranged from 9.96-14.52 degrees Celsius. The upgradient and downgradient readings across the Project are similar and comparable to each other, and therefore the construction activities have not impacted surface water temperatures.

## **2.3 Dissolved Oxygen**

Dissolved oxygen levels were higher than the favorable value of 6 mg/L in all locations that were not dry for all three months. However, the upgradient and downgradient at Station 561 were below 6 mg/L, indicating levels of dissolved oxygen of 5.96 mg/L and 5.98 mg/L in April. The upgradient and downgradient readings across the Project are similar in comparison to each other, and therefore the construction activities have not impacted surface water dissolved oxygen levels.

## **2.4 pH**

The monitoring locations reported all the pH levels to be within normal ranges for cold water fisheries at 6.5-8.3 for February through April 2023. The readings at stations 527 U/D, 540 U/D, 561 U/D, 700 U/D, 710 D, and 747 U/D were slightly lower than favorable (<6.5 pH) in the February 2023 sampling event. These readings are lower than previous readings in 2022 and January 2023. The upgradient and downgradient readings across the Project are similar to each other, and therefore the construction activities have not impacted surface water pH levels.

## **2.5 Specific Conductivity**

All three monitoring events, for specific conductivity at 25 degrees Celsius at a majority of the Stations were within the acceptable range for freshwater fisheries of 150-500 µS/cm. Readings were above 500 µS/cm in surface water locations at ST 400 U/D in March, ST 700U/710D all three months, ST 725 U/D in February and April, and ST 747U/D for all three months. The monitoring results at ST 710 U/D at the Hop Brook Tributary were far above the desired readings between February through April 2023. However, these results correlate with previous monitoring results at this station. Levels between 500 – 1500 µS/cm are typical for freshwater streams and in the months of February and March the readings were reported to be above 1500 µS/cm. No difference was observed between the upgradient and downgradient readings across the Project, and therefore the construction activities have not impacted surface water specific conductivity.

## **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. For each of the monitoring events between February 2023 and April 2023, turbidity levels at each station

were observed to be less than 5 NTUs in all locations other than ST 700 and ST 710 at the Hop Brook Tributary. Within this tributary, poor water quality conditions and frequent turbid water has been observed including before construction began. The upgradient and downgradient readings across the Project are coinciding to each other, concluding the construction activities have not impacted surface waters turbidity.

## **2.7 Other Parameters**

The stream flow velocities from the downgradient side to the upgradient side were similar and consistent from month to month. The ORP, alkalinity, chlorine, and hardness levels from the downgradient side to the upgradient side were the same within the sampling months. Alkalinity and chlorine levels were within the desirable levels for freshwater.

## **3 SUMMARY**

No significant differences were observed between upgradient and downgradient stations across the Project corridor. Therefore, construction activities do not appear to be impacting the water quality of these coldwater fisheries.

## **4 REFERENCES**

- Buttner, Soderberg and Terlizzi. 1993. An Introduction to Water Chemistry in Freshwater Aquaculture. UMASS Dartmouth NRAC Fact Sheet 170-1993. Available at: [https://freshwater-aquaculture.extension.org/wp-content/uploads/2019/08/Introduction\\_to\\_Water\\_Chemistry\\_for\\_Freshwater\\_Aquaculture.pdf](https://freshwater-aquaculture.extension.org/wp-content/uploads/2019/08/Introduction_to_Water_Chemistry_for_Freshwater_Aquaculture.pdf). Accessed on August 12, 2021.
- Commonwealth of Massachusetts. 2013. 314 CMR 4.00 Massachusetts Surface Water Quality Standards, available at: <https://www.mass.gov/doc/314-cmr-400-surface-water-quality-standards/download>. Accessed on August 12, 2021.
- United States Environmental Protection Agency (“EPA”). 1997 Volunteer Stream Monitoring: A Methods Manual EPA 841-B-97-003, available at: <https://www.epa.gov/sites/default/files/2015-06/documents/stream.pdf>. Accessed on August 12, 2021.
- . 2009. National Primary Drinking Water Regulations EPA 816-F-09-004. Available at: <https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations>. Accessed on August 12, 2021.
- . 1986. Quality criteria for water 1986: Washington, D.C., U.S. Environmental Protection Agency Report 440/5-86-001, Office of Water, Available at: <https://www.epa.gov/sites/default/files/2018-10/documents/quality-criteria-water-1986.pdf>. Accessed on December 13, 2021.
- . 1987. National Recommended Water Quality Criteria for Aquatic Life. Available at: <https://www.epa.gov/wqc/national-recommended-water-quality-criteria-tables>. Accessed on August 12, 2021.

**APPENDIX A**

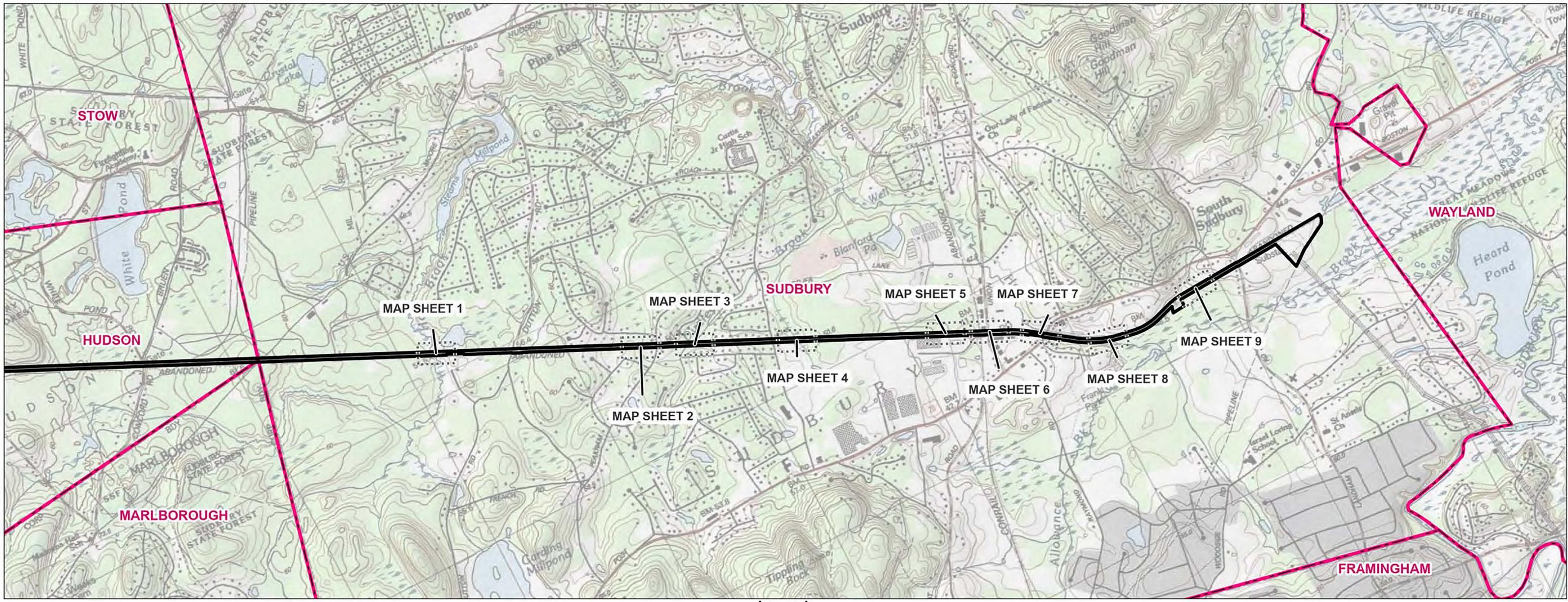
**Figures Map Book**

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# 2021 - Sudbury Hudson Reliability Project

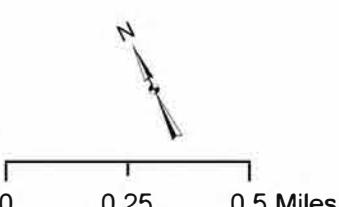
HUDSON, STOW, & SUDBURY, MA  
Water Sampling Map

Date: August 11, 2021



## Legend

..... Map Sheet Matchline



INDEX OF FIGURES  
Title Sheet / Index Map  
Map Sheets 1-9

NO.	DATE	REVISIONS

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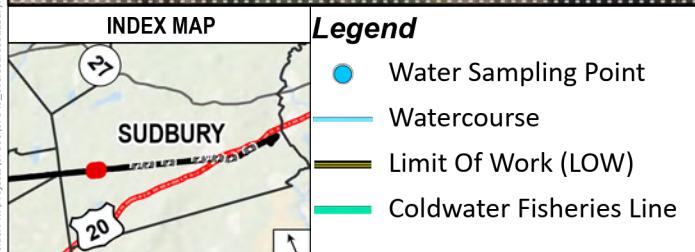
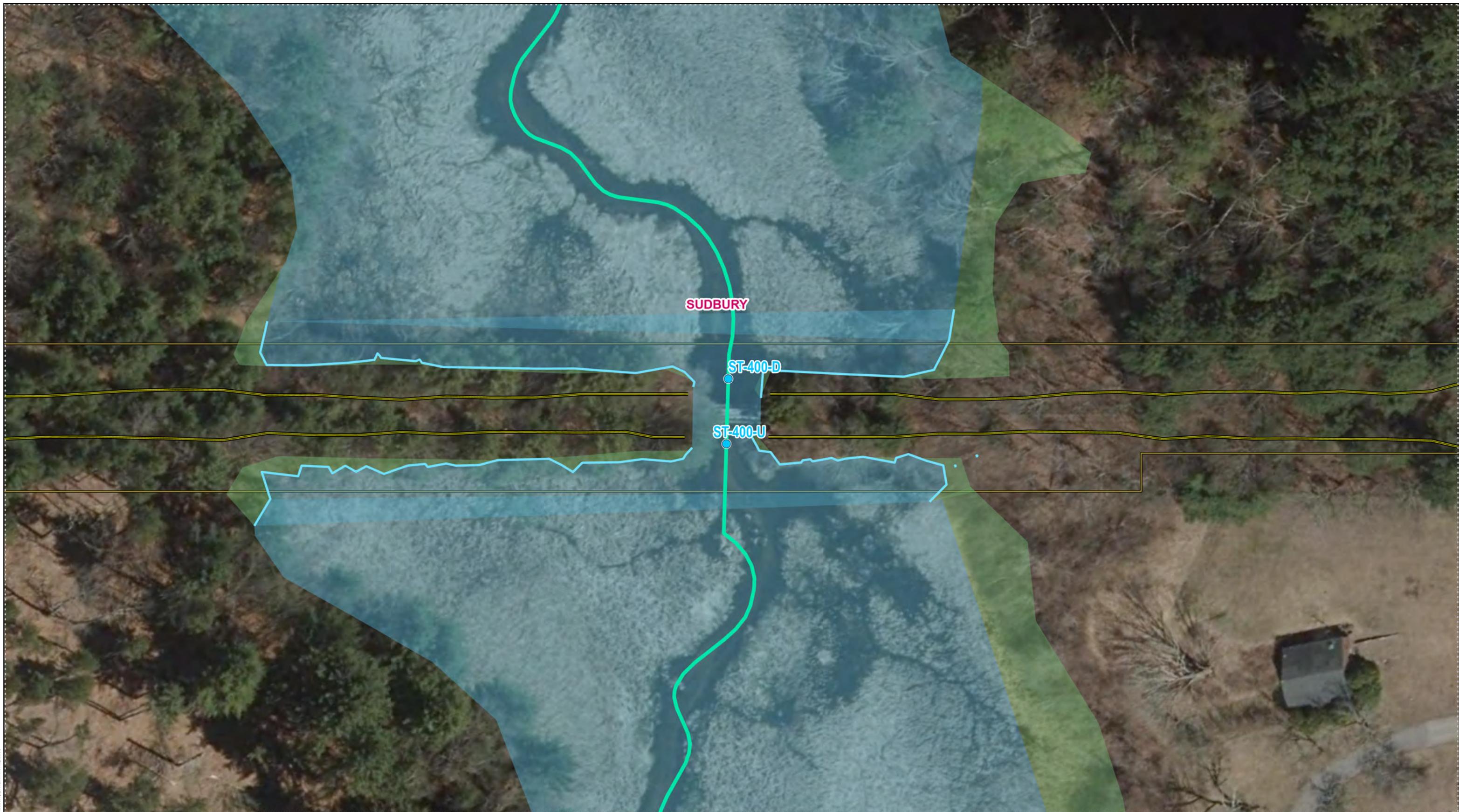
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ENERGY

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PREPARED BY:

**SWCA**

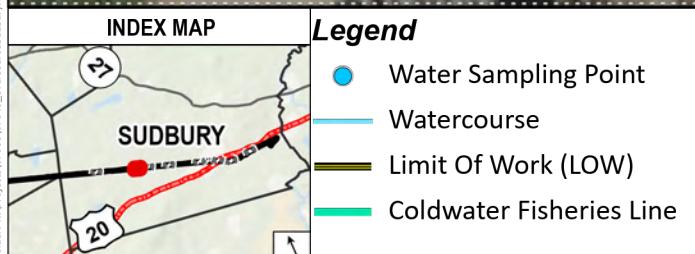
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15 Research Drive  
Amherst, MA 01002



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  - Municipal Boundary

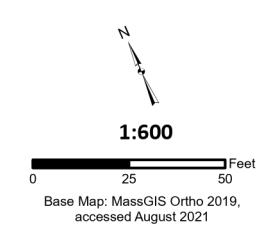
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SUDBURY, MA		MAP SHEET 1 OF 9		
Date: August, 2021		SWCA		ENVIRONMENTAL CONSULTANTS
NO.	DATE	REVISIONS		

**Legend**

- Water Sampling Point
- Watercourse
- Limit Of Work (LOW)
- Coldwater Fisheries Line

- Open Water
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- Municipal Boundary



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**EVERSOURCE**  
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Water Sampling Map**

SUDSBURY, MA

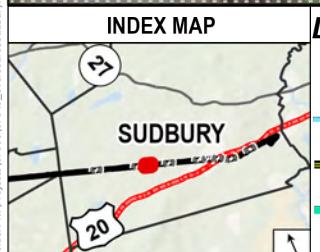
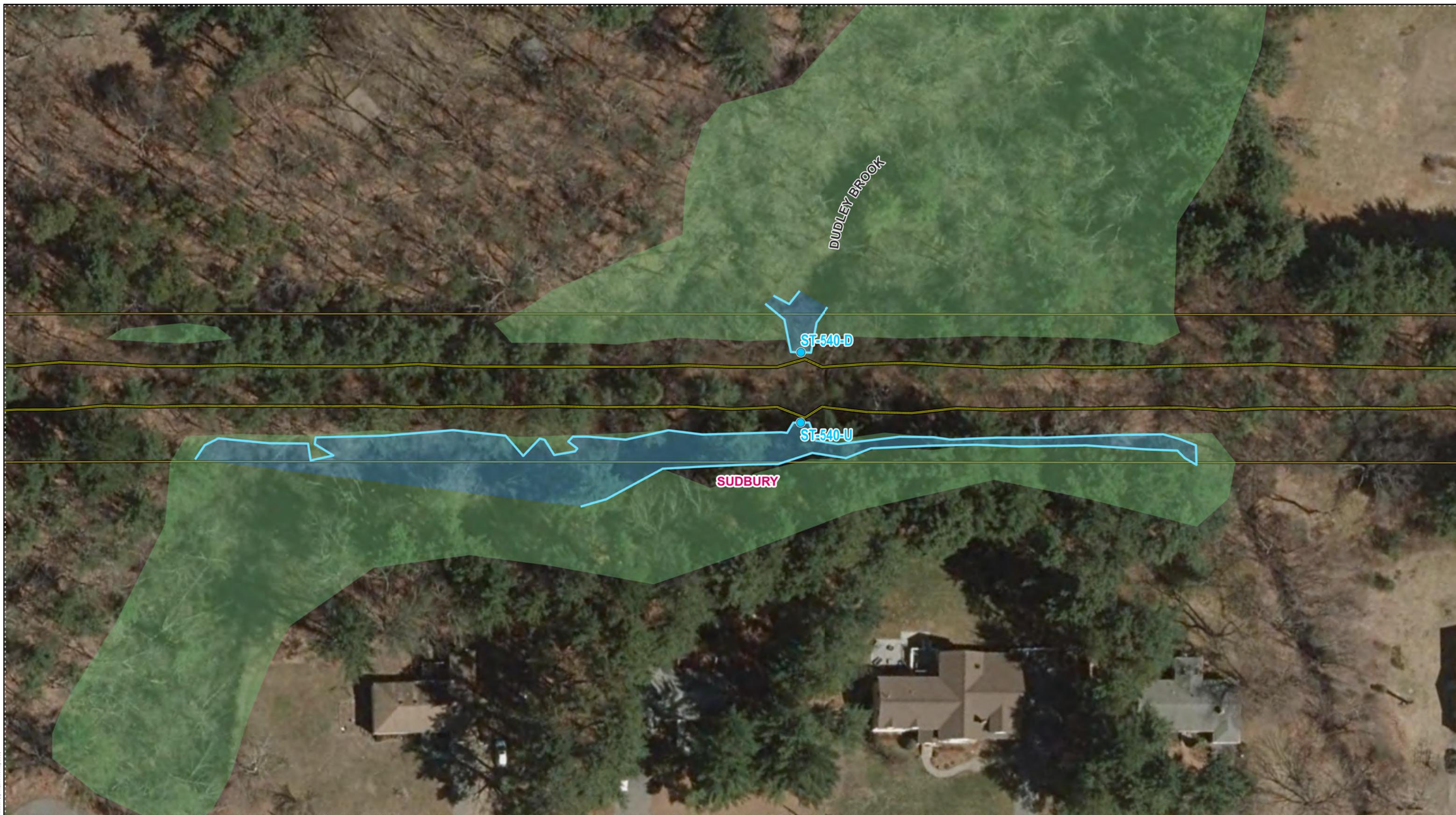
MAP SHEET 2 OF 9

Date: August, 2021

SWCA

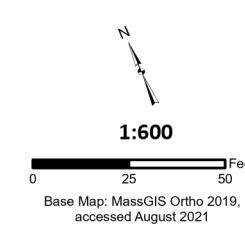
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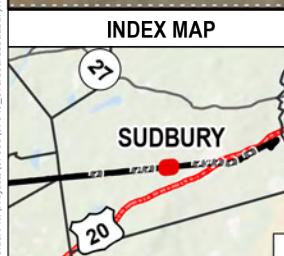
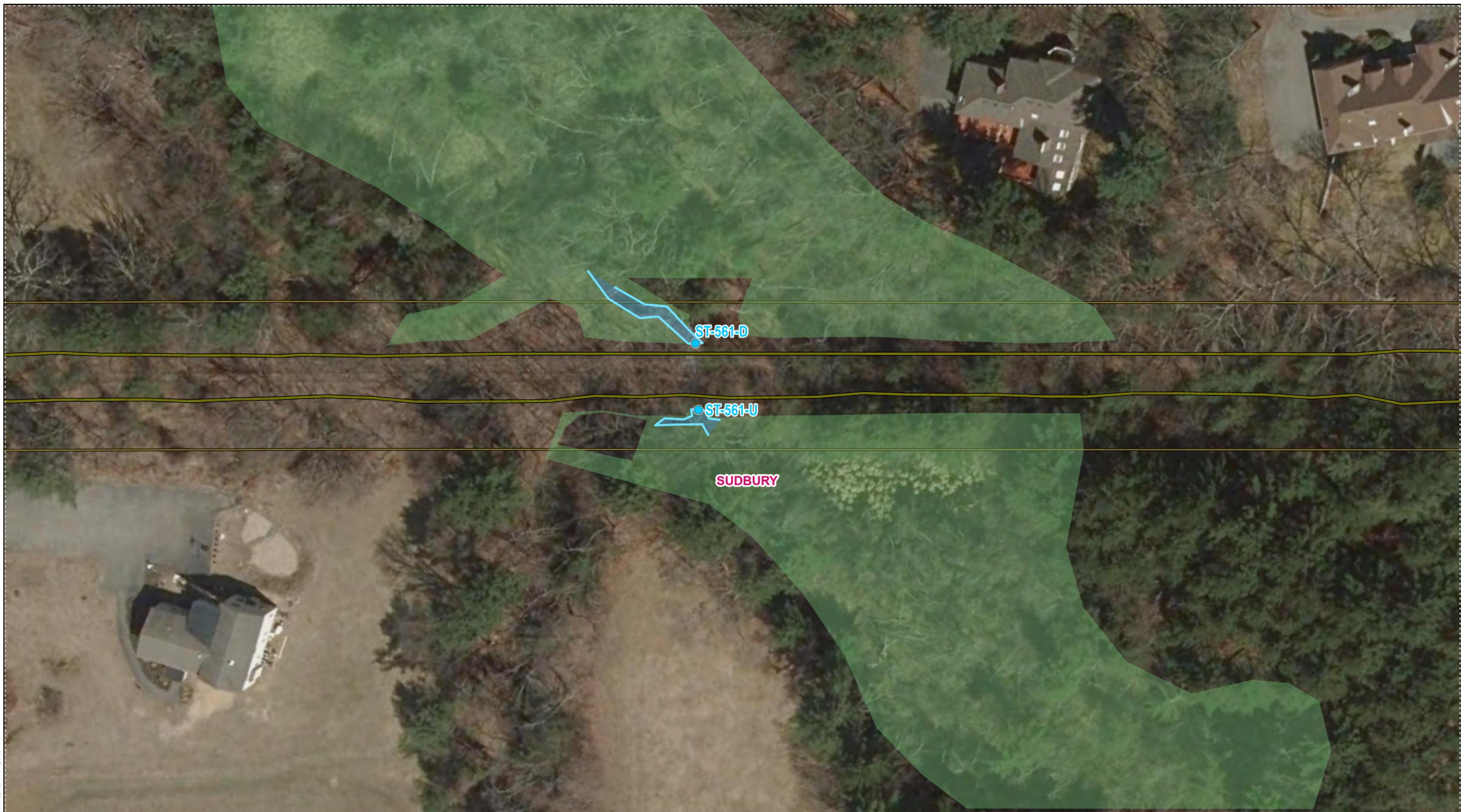
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SUDBURY, MA MAP SHEET 3 OF 9

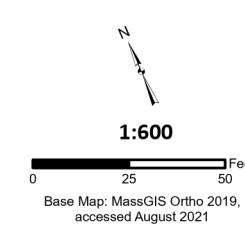
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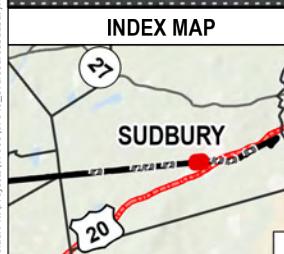
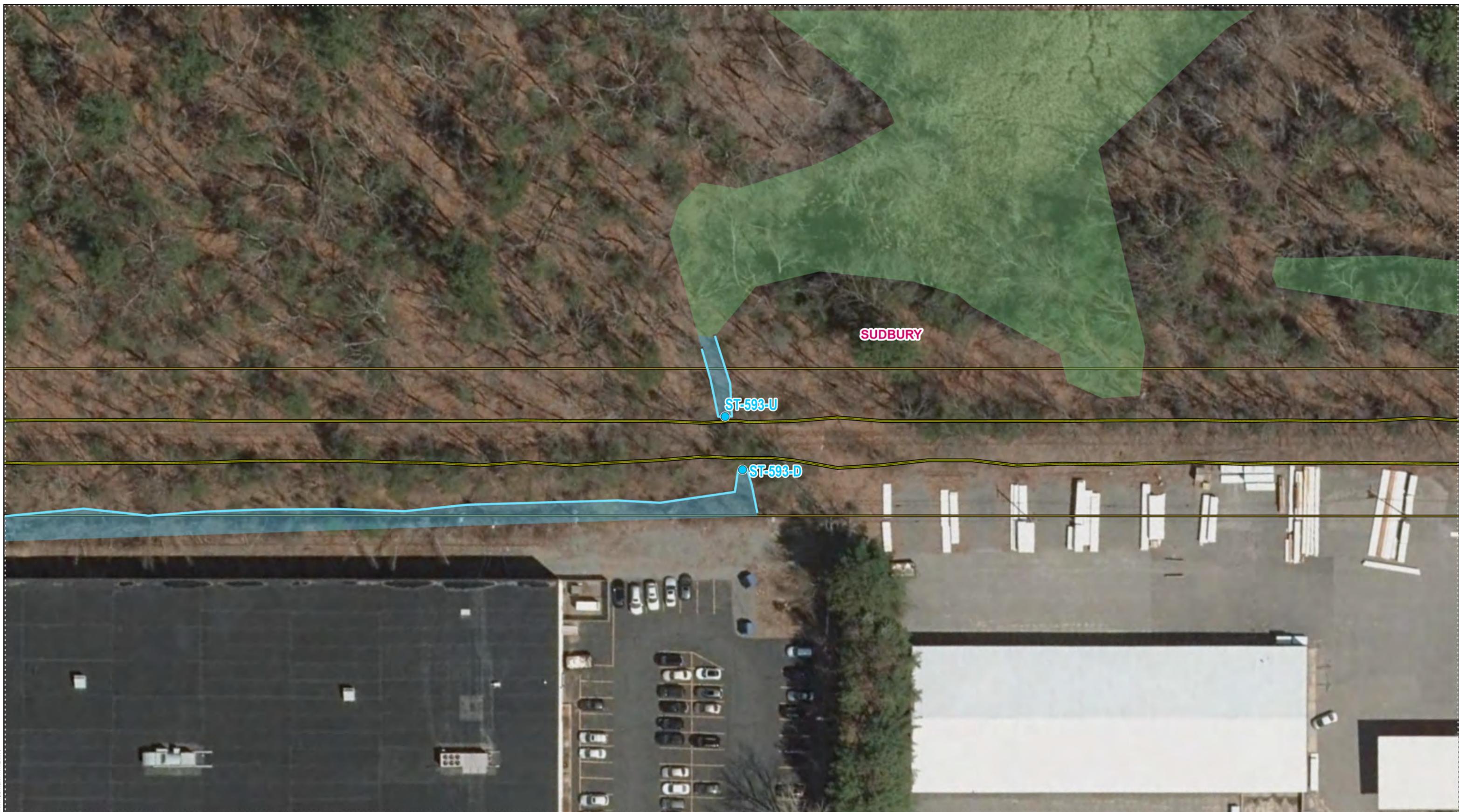
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SUDSBURY, MA MAP SHEET 4 OF 9

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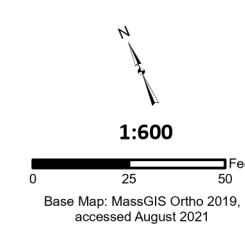
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EVERSOURCE  
ENERGY

Sudbury Hudson Reliability Project  
Water Sampling Map

SUDBURY, MA MAP SHEET 5 OF 9

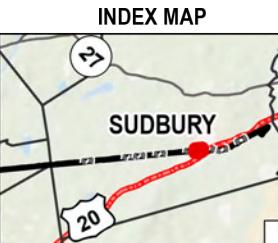
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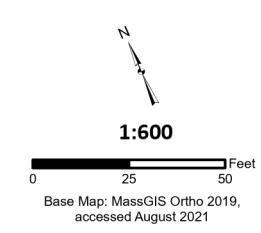
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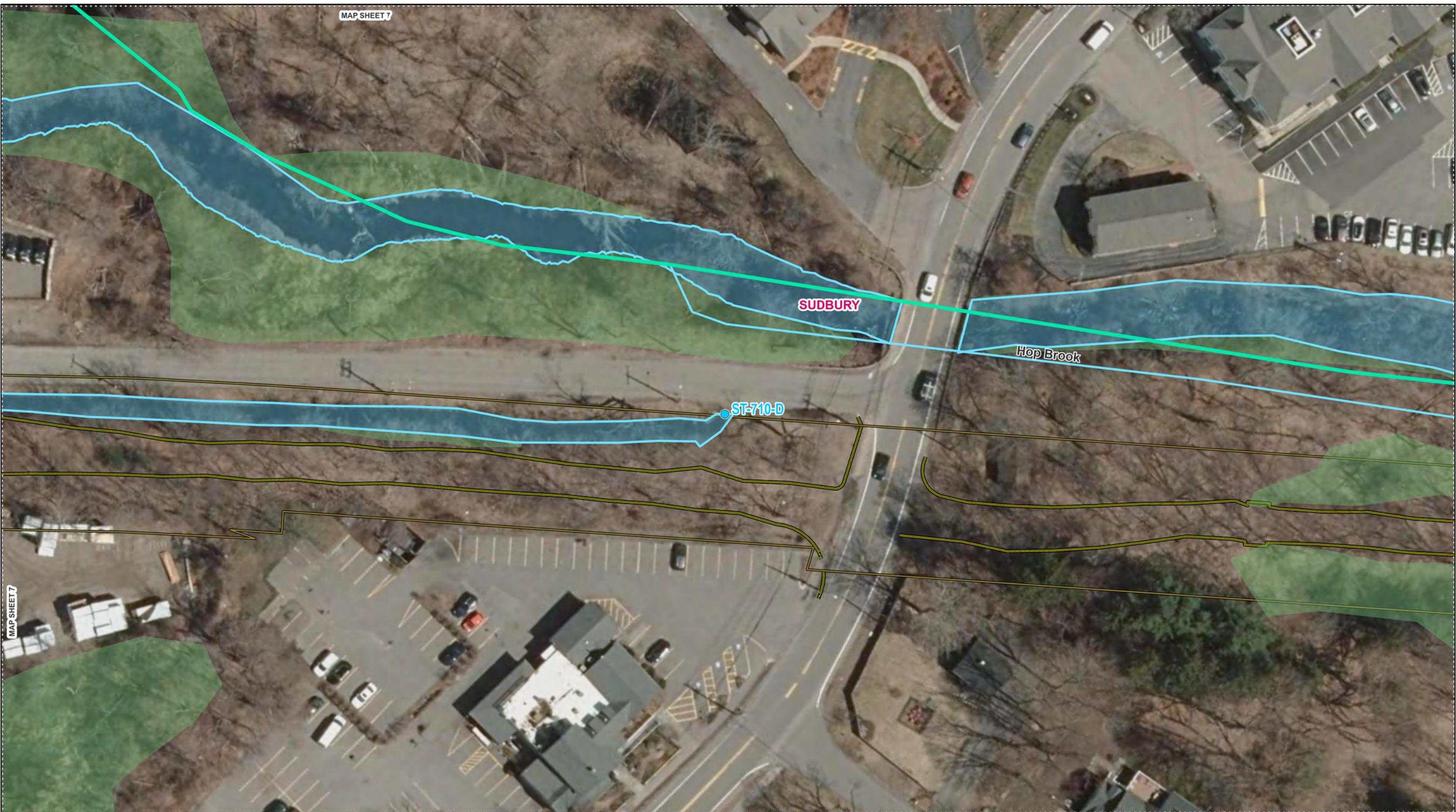
Sudbury Hudson Reliability Project  
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SUDBURY, MA MAP SHEET 6 OF 9

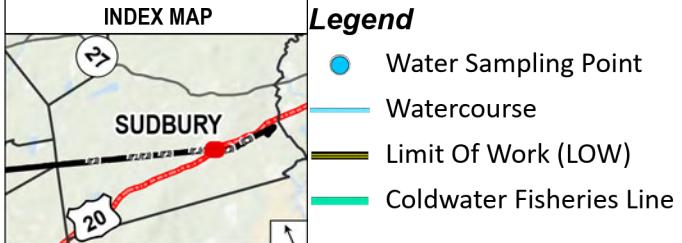
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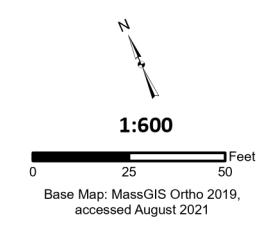
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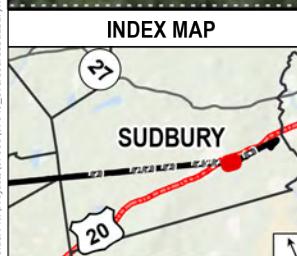
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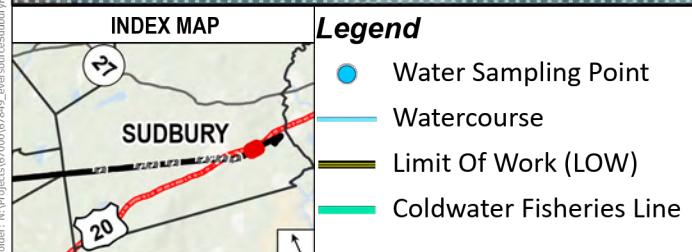
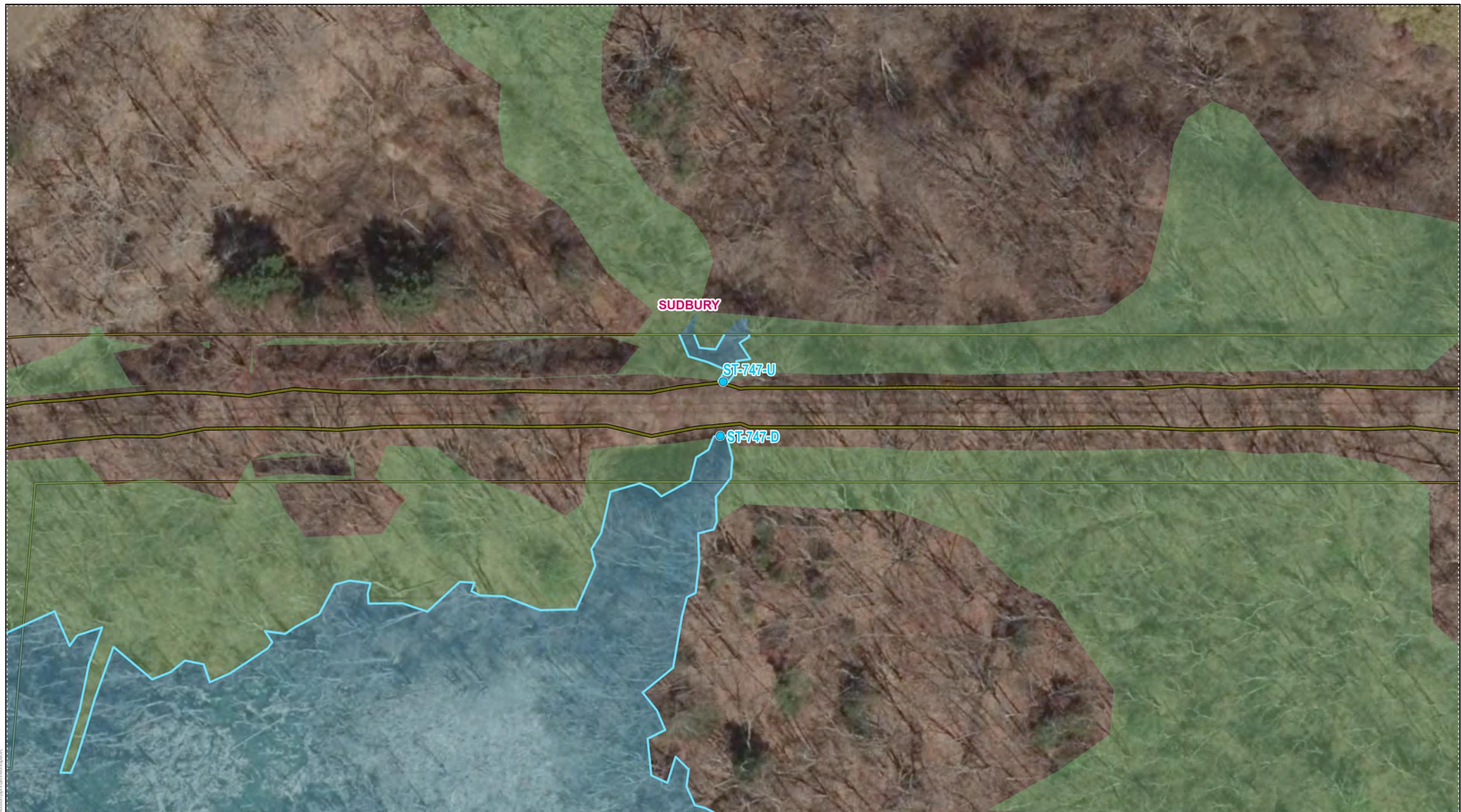
Sudbury Hudson Reliability Project  
Water Sampling Map

SUDBURY, MA MAP SHEET 8 OF 9

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Sudbury Hudson Reliability Project  
Water Sampling Map

SUDBURY, MA MAP SHEET 9 OF 9

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## **APPENDIX B**

### **Tables**

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

Station #	Favorable Conditions for Brook/Stream/Tributary	ST 400 UP																				
Plan #	Hop Brook																					
Direction of Flow	Cold south																					
Type	perennial																					
Date		30-Aug	30-Sep	29-Oct	30-Nov	23-Dec	19-Jan	23-Feb	18-Mar	22-Apr	23-May	24-Jun	27-Jul	25-Aug	23-Sep	28-Oct	21-Nov	21-Dec	30-Jan	24-Feb	24-Mar	20-Apr
Temperature (°C)	< 20	22.25	16.20	9.23	2.77	2.16	2.48	6.48	11.88	15.15	24.82	21.27	26.25	22.64	16.06	11.38	2.3	2.37	4.35	0.96	10.49	12.04
Specific Conductance (µS/cm @ 25°C)	150-500	414	422	421	408	410	573	768	730	727	889	771	787	852	666	598	764	572	523	403	503	450
Specific Conductance (µS/cm)	150-500	393	351	294	235	231	327	496	547	599	880	716	806	813	552	442	432	325	316	235	364	367
Dissolved Oxygen (%)	nsl	62	80	87	97	101	99	80.1	88.8	97.1	74.6	90.5	84.1	62.8	73.6	78.8	84.5	88	89.9	74.7	90.3	91.1
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	8.00	6.78	5.4	7.23	8.60	11.55	12.03	11.66	10.66	10.02	10.28
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	7.42	7	7.79	7.78	6.8	6.8	7.2	6.68	6.9	6.74	6.98
ORP	nsl	91	94	93	78	104	69	156	144	137	107	73	60	73	85	109	135	34	Nm	Nm	Nm	Nm
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	3.64	1.69	2.6	1.6	2.7	2.4	1.25	0.87	2.62	1.88	1.78
Alkalinity	< 300	40	40	0	0	0	0	100	100	100	100	100	100	100	100	100	100	100	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	0
Chlorine, Total	< 4	0	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	40	40	40	40	40	40	40	40	40	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	0.32	0.14	0.29	0.59	0.36	0.35	1.25	0.48	1.376	0.75	0.62



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

Station #	Favorable Conditions for Brook/Stream/Tributary PLAN 47	ST 400 DOWN																						
Plan #		Hop Brook																						
Direction of Flow	south																							
Type	perennial																							
Date		30-Aug	30-Sep	29-Oct	30-Nov	23-Dec	19-Jan	23-Feb	18-Mar	22-Apr	23-May	24-Jun	27-Jul	25-Aug	23-Sep	28-Oct	21-Nov	21-Dec	30-Jan	24-Feb	24-Mar	20-Apr		
Temperature (°C)	< 20	22.25	16.17	9.22	2.74	2.12	2.47	6.45	11.85	15.16	24.78	21.14	26.18	22.59	16.04	11.39	2.29	2.37	4.34	0.95	10.48	11.4		
Specific Conductance ( $\mu\text{S}/\text{cm}$ @ 25°C)	150-500	415	422	420	408	408	573	775	717	715	868	777	788	877	681	604	761	572	525	422	506	417		
Specific Conductance ( $\mu\text{S}/\text{cm}$ )	150-500	394	351	293	235	230	327	500	537	580	865	718	805	834	564	447	431	325	318	227	365	310		
Dissolved Oxygen (%)	nsl	60	78	86	104	105	99	83.5	87.9	93.5	75.9	90	77.5	63.6	74.1	79.9	83.7	88	91	74.7	85.5	88.5		
Dissolved Oxygen (mg/L)	> 6	5.20	7.64	9.02	14.05	14.33	13.46	10.24	9.48	9.37	6.26	7.98	6.24	5.49	7.3	8.68	11.46	12.03	11.79	10.65	9.53	9.45		
pH	6.5-8.3	6.6	6.7	6.7	6.5	6.8	7.0	7.1	7.47	7.85	7.7	7.73	7	7.85	7.68	6.8	7.2	6.79	7.0	6.67	6.94			
ORP	nsl	91	94	93	79	117	119	159	146	142.4	103	60	50	75	86.2	140	140	34	Nm	Nm	Nm	Nm		
Turbidity (NTU) <small>Free from turbidity that would impair fish habitat</small>	2.86	1.73	2.30	2.02	2.43	2.56	1.88	1.04	1.91	1.97	3.25	1.5	2.63	1.3	2.74	2.45	1.25	0.86	2.64	1.35	1.96			
Alkalinity	< 300	40	40	0	0	0	0	100	100	100	100	100	100	100	100	100	100	100	100	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	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	0	0	
Hardness	nsl	100	0	0	0	20	0	40	20	40	40	40	40	40	40	40	40	40	40	40	40	40	40	
Velocity (ft/s)	nsl	0.34	0.31	0.39	0.4	Na	0.35	1.25	0.32	0.49	0.28	0.3	0.17	0.34	0.56	0.4	0.37	1.25	0.475	1.247	0.67	0.59		



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

Station #	Favorable Conditions for Brook/Stream/Tributary	ST 527 UP		Unnamed Stream																					
Plan #																									
Direction of Flow				PLAN 52																					
Type				south				intermittent																	
Date		30-Aug	30-Sep	29-Oct	30-Nov	23-Dec	19-Jan	23-Feb	18-Mar	22-Apr	23-May	24-Jun	27-Jul	25-Aug	23-Sep	28-Oct	21-Nov	21-Dec	30-Jan	24-Feb	24-Mar	20-Apr			
Temperature (°C)		< 20	17.19	12.17	7.42	2.39	1.56	1.08	5.58	10.66	13.53	17.21	15.18	dry	dry	13.4	8.75	1.82	0.92	5.31	2.45	10.1	14.03		
Specific Conductance ( $\mu\text{S}/\text{cm}$ at 25°C)	150-500	305	290	201	301	260	309	527	426	508	487	563	dry	dry	587	474	623	462	366	334	303	409			
Specific Conductance ( $\mu\text{S}/\text{cm}$ )	150-500	259	219	148	170	144	163	332	309	397	420	458	dry	dry	493	327	389	241	229	190	217	318			
Dissolved Oxygen (%)	nsl	51	61	54	67	70	72	62.4	78.8	91.3	50.5	63.6	dry	dry	71.2	44.3	65.3	76.5	85.5	85.3	76.3	81.1			
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	6.42	6.62	6.8	dry	dry	7.03	5.13	8.91	9.49	10.82	11.63	8.57	8.34	
pH	6.5-8.3	5.4	6.1	6.3	6.3	6.0	6.0	6.2	6.37	6.42	6.38	dry	dry	7.2	6.8	7	6.14	5.7	7.3	7.17					
ORP	nsl	130	117	105	97	127	97	200	186	179	119	Ns	dry	dry	90	98	87	100	<Null>	<Null>	Nm	Nm			
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	0.76	dry	dry	1.97	1.77	3.76	1.77	1.64	0.94	1.68	1.2		
Alkalinity	< 300	0	0	0	100	0	0	0	0	0	0	100	100	dry	dry	100	100	100	100	0	100	100	100		
Chlorine, Free	< 4	0	0	0	0	0	0	0	0	0	0	0	0	dry	dry	0	0	0	0	0	0	0	0		
Chlorine, Total	< 4	0	0	0	0	0	0	0	0	0	0	0	0	dry	dry	0	0	0	0	0	0	0	0		
Hardness	nsl	100	0	0	0	20	0	0	20	0	0	0	0	dry	dry	40	0	40	0	40	40	40	40		
Velocity (ft/s)	nsl	0.2	0.18	0.1	0.21	Na	0.15	0.53	0.09	0.08	0.14	0.09	dry	dry	0.14	0.13	0.013	0.15	0.186	0.092	0.18	0.14			

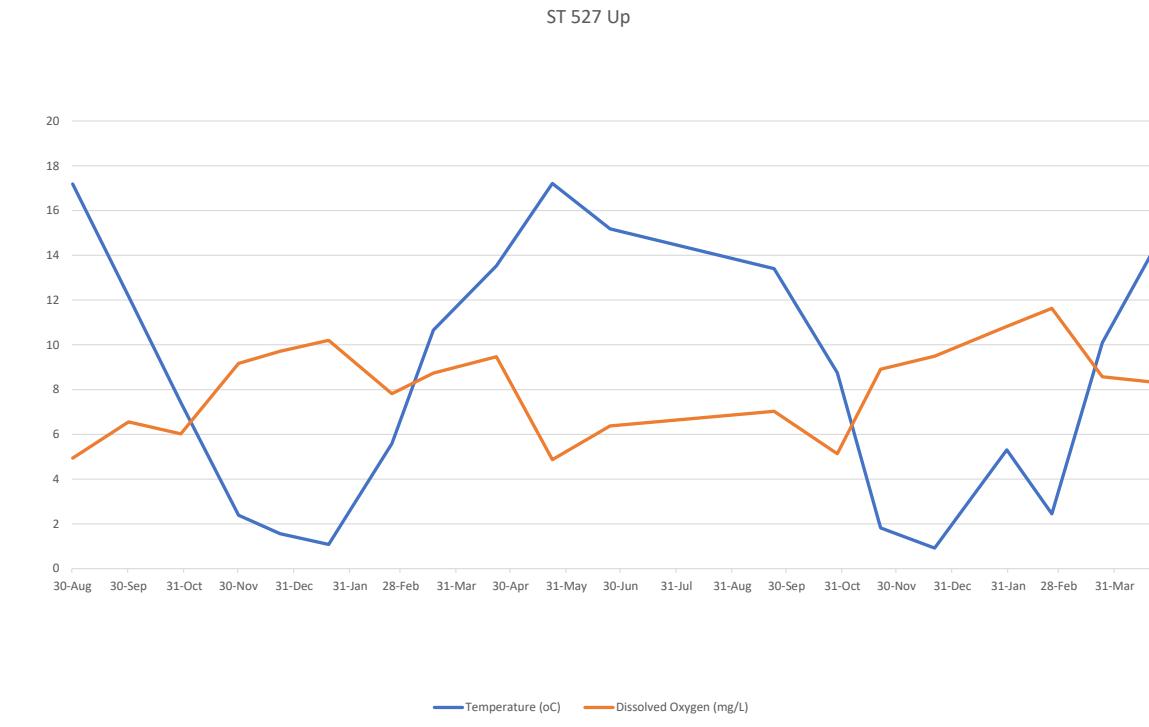


Table 3: Cold Water Fisheries Monitoring Results  
Sudbury to Hudson Reliability Project

Station #	Favorable Conditions for Cold Water Fisheries	ST 527 DOWN																						
Brook/Stream/Tributary		Unnamed Stream																						
Plan #		PLAN 52																						
Direction of Flow		south																						
Type		intermittent																						
Date		30-Aug	30-Sep	29-Oct	30-Nov	23-Dec	19-Jan	23-Feb	18-Mar	22-Apr	23-May	24-Jun	27-Jul	25-Aug	23-Sep	28-Oct	21-Nov	21-Dec	30-Jan	24-Feb	24-Mar	20-Apr		
Temperature (°C)		< 20	17.07	12.13	7.36	2.48	1.63	1.07	5.49	10.11	13.11	17.17	14.88	dry	dry	13.56	8.84	1.68	0.89	4.74	2.82	10.08	13.96	
Specific Conductance ( $\mu\text{S}/\text{cm}$ at 25°C)	150-500	301	287	204	304	262	294	538	435	513	604	579	dry	dry	560	482	624	481	374	341	305	405		
Specific Conductance ( $\mu\text{S}/\text{cm}$ )	150-500	255	217	154	174	145	159	337	311	396	513	467	dry	dry	479	323	402	274	229	196	218	320		
Dissolved Oxygen (%)	nsl	52	64	56	67	74	74	64.6	70.9	85.3	54.5	61.8	dry	dry	67.9	39.4	67.4	73.5	75.3	75.9	76.1	81.6		
Dissolved Oxygen (mg/L)	> 6	4.98	6.87	6.16	9.12	10.31	10.45	8.13	7.88	8.95	5.23	6.23	dry	dry	6.89	4.57	8.46	10.21	9.65	10.22	8.56	8.41		
pH	6.5-8.3	5.8	6.5	6.4	6.4	6.2	6.0	6.2	6.38	6.48	6.58	6.78	dry	dry	7.2	6.8	6.8	7	6.87	5.7	7.14	6.88		
ORP	nsl	127	106	105	96	122	81	175	178	173	123	116	dry	dry	80	90	76	60	Nm	Nm	Nm	Nm		
Turbidity (NTU)	Free from turbidity that would impair fish habitat.		1.18	0.84	1.56	1.40	2.00	1.50	1.81	1.26	1.4	2.18	0.64	dry	dry	1.89	1.24	3.78	1.48	1.94	0.33	1.47	0.99	
Alkalinity	< 300	0	0	0	100	0	0	0	0	0	0	0	100	100	dry	dry	100	100	100	100	0	100	100	100
Chlorine, Free	< 4	0	0	0	0	0	0	0	0	0	0	0	0	dry	dry	0	0	0	0	0	0	0	0	
Chlorine, Total	< 4	0	0	0	0	0	0	0	0	0	0	0	0	dry	dry	0	0	0	0	0	0	0	0	
Hardness	nsl	100	100	0	0	0	0	0	20	0	0	0	dry	dry	40	0	40	40	0	40	40	40	40	
Velocity (ft/s)	nsl	0.21	0.06	0.13	0.14	Na	0.1	0.48	0.23	0.17	0.09	0.06	dry	dry	0.12	0.09	0.01	0.1	0.155	0.193	0.16	0.13		

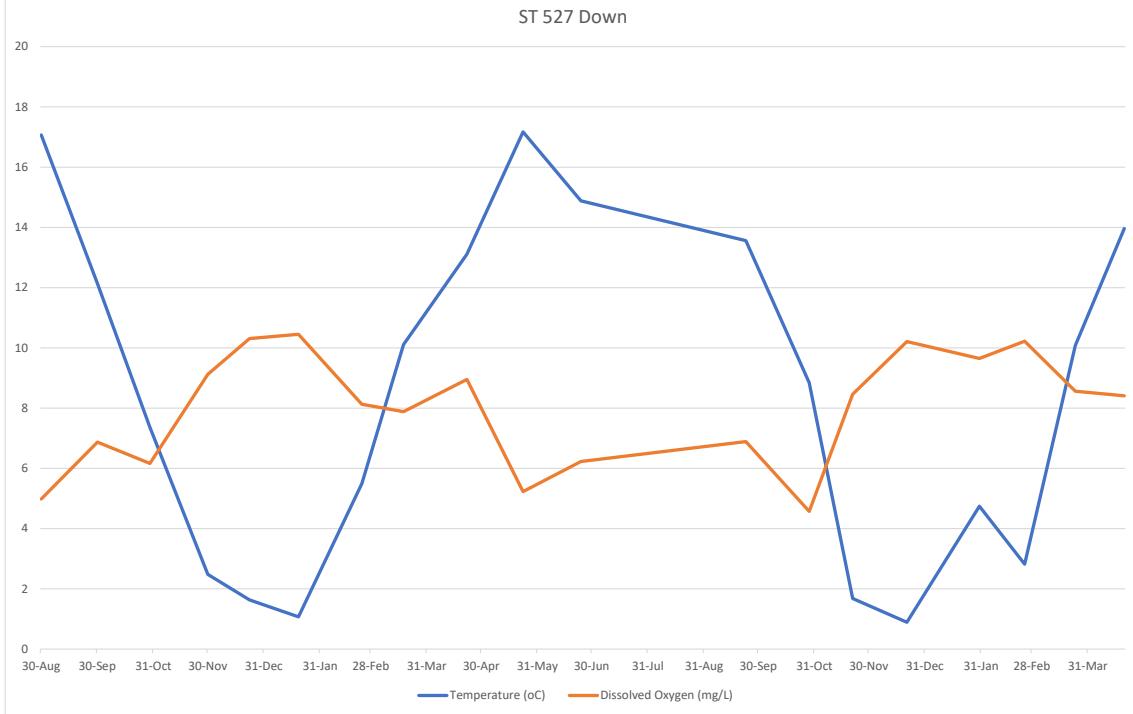


Table 3: Cold Water Fisheries Monitoring Results  
Sudbury to Hudson Reliability Project

Station #	Favorable Conditions for Cold Water Fisheries	ST 540 UP																					
Brook/Stream/Tributary		Dudley Brook																					
Plan #		PLAN 54																					
Direction of Flow		south																					
Type		perennial																					
Date		30-Aug	30-Sep	29-Oct	30-Nov	23-Dec	19-Jan	23-Feb	18-Mar	22-Apr	23-May	24-Jun	27-Jul	25-Aug	23-Sep	28-Oct	21-Nov	21-Dec	30-Jan	24-Feb	24-Mar	20-Apr	
Temperature (°C)		< 20	18.84	13.17	7.78	1.62	1.02	0.42	5.2	10.35	12.72	19.67	17.54	21.73	20.7	13.9	9.67	1.47	0.86	3.55	1.15	8.99	11.72
Specific Conductance ( $\mu\text{S}/\text{cm}$ @ 25°C)	150-500	340	305	271	312	288	377	573	487	553	663	630	609	890	701	654	599	461	405	436	488	433	
Specific Conductance ( $\mu\text{S}/\text{cm}$ )	150-500	300	236	182	172	157	198	360	350	423	599	540	561	805	625	378	330	248	238	237	256	323	
Dissolved Oxygen (%)	nsl	16	56	52	73	79	80	83	84.4	70.6	42.1	53	58.3	57.8	67	34.8	59.7	70	73.9	77.5	117.8	78.2	
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	5.07	5.12	4.77	6.92	3.93	8.35	9.97	9.78	10.94	12.3	8.47	
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	7.2	6.8	7	7.2	6.6	6.9	7.2	6.22	6.1	6.83	6.71	
ORP	nsl	123	101	101	87	106	55	162	176	168	107	94	100	80	135	68	100	173	Nm	Nm	Nm	Nm	
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	2.48	3.29	4.2	2.66	4.5	3.56	0.92	0.42	0.52	2.56	1.99
Alkalinity	< 300	40	20	0	100	0	0	100	0	100	100	100	100	100	100	100	100	100	100	0	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	0	
Chlorine, Total	< 4	0	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	0	0	0	20	20	40	40	40	40	40	40	40	40	40	40	40	40	
Velocity (ft/s)	nsl	0.55	0.44	0.66	0.31	Na	0.8	0.78	0.52	1.1	0.4	0.25	1.09	0.19	0.26	0.26	0.035	0.52	1.445	1.442	0.87	0.81	

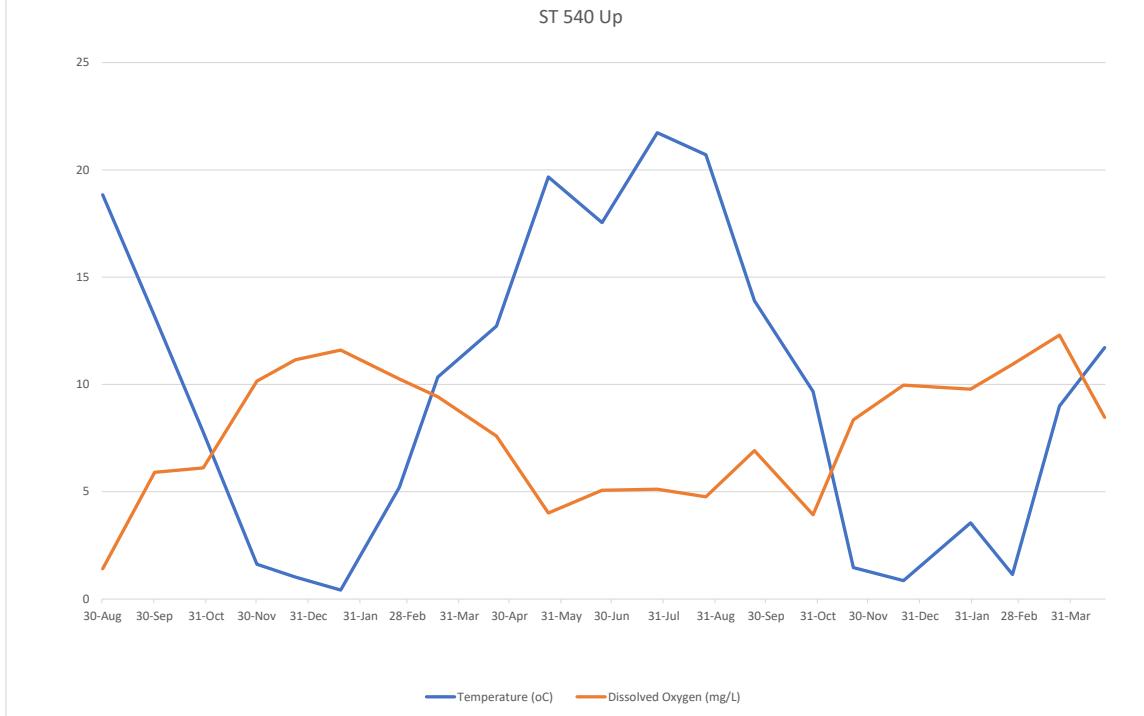


Table 3: Cold Water Fisheries Monitoring Results  
Sudbury to Hudson Reliability Project

Station #	Favorable Conditions for Cold Water Fisheries	ST 540 DOWN																				
Brook/Stream/Tributary		Dudley Brook																				
Plan #		PLAN 54																				
Direction of Flow		south																				
Type		perennial																				
Date	30-Aug	30-Sep	29-Oct	30-Nov	23-Dec	19-Jan	23-Feb	18-Mar	22-Apr	23-May	24-Jun	27-Jul	25-Aug	23-Sep	28-Oct	21-Nov	21-Dec	30-Jan	24-Feb	24-Mar	20-Apr	
Temperature (°C)		< 20	18.83	13.18	7.89	1.72	0.80	0.27	5.47	10.32	13.11	19.94	17.43	21.97	20.6	13.56	9.73	1.56	1.00	3.33	1.21	8.89
Specific Conductance (µS/cm at 25°C)	150-500	344	311	274	311	296	376	628	480	555	674	654	591	895	560	558	585	484	406	446	445	439
Specific Conductance (µS/cm)	150-500	303	241	184	173	159	199	394	345	429	609	559	556	820	479	395	323	262	238	244	208	327
Dissolved Oxygen (%)	nsl	42	67	59	76	88	78	74.3	77.2	86.4	46.7	57	55.2	57.1	67.9	36.3	59.4	75.1	72.2	79	106.7	79
Dissolved Oxygen (mg/L)	> 6	3.86	6.98	7.00	10.57	12.49	11.33	9.28	8.63	9.06	4.24	5.51	4.82	4.92	6.89	4.11	8.27	10.61	9.62	11.12	11.8	8.57
pH	6.5-8.3	6.3	6.7	6.9	6.8	6.5	7.0	6.8	7.04	7.11	7.02	7.11	7.2	7	7.2	6.5	6.98	7.2	6.32	6.0	6.62	6.64
ORP	nsl	115	97	101	85	103	52	137	151	128	125	88	100	78	80	87	120	43	Nm	Nm	Nm	Nm
Turbidity (NTU) Free from turbidity that would impair fish habitat	2.09	1.34	1.84	1.77	1.46	1.94	2.08	1.8	1.4	2.2	2.56	3.4	3.61	1.89	2.25	2.97	0.42	0.96	0.36	2.56	1.8	
Alkalinity	< 300	40	40	0	0	0	0	0	0	100	100	100	100	100	100	100	100	100	0	0	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	0
Chlorine, Total	< 4	0	0	0	0	0	0	0	<Null>	0	0	0	0	0	0	0	0	0	0	0	0	0
Hardness	nsl	100	0	0	0	20	0	0	20	20	40	40	40	40	40	40	40	40	40	40	40	40
Velocity (ft/s)	nsl	0.4	0.34	0.8	0.31	Na	0.25	0.6	1.2	0.82	0.36	0.57	0.26	0.26	0.12	0.43	0.045	0.48	1.128	1.305	0.68	0.83

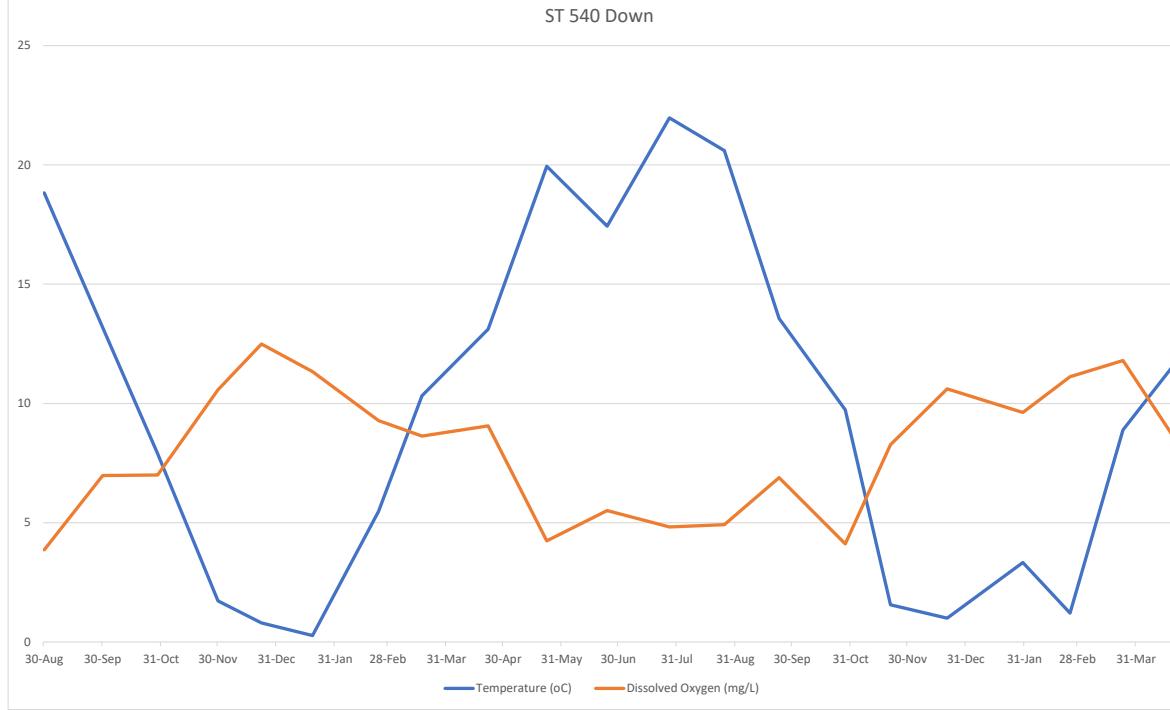


Table 3: Cold Water Fisheries Monitoring Results  
Sudbury to Hudson Reliability Project

Station #	Favorable Conditions for Brook/Stream/Tributary	ST 561 UP		Unnamed Stream																				
Plan #		PLAN 57																						
Direction of Flow		north																						
Type		intermittent																						
Date		30-Aug	30-Sep	29-Oct	30-Nov	23-Dec	19-Jan	23-Feb	18-Mar	22-Apr	23-May	24-Jun	27-Jul	25-Aug	23-Sep	28-Oct	21-Nov	21-Dec	30-Jan	24-Feb	24-Mar	20-Apr		
Temperature (°C)	< 20	20.59	14.12	7.57	0.84	0.02	0.22	6.7	12.92	15.79	21	dry	4.1	0.84	9.17	14.2								
Specific Conductance ( $\mu\text{S}/\text{cm}$ @ 25°C)	150-500	361	344	243	308	244	269	485	439	557	790	dry	408	426	469	479								
Specific Conductance ( $\mu\text{S}/\text{cm}$ )	150-500	331	272	162	166	127	141	315	337	459	678	dry	245	229	210	380								
Dissolved Oxygen (%)	nsl	22	42	38	64	71	40	62.4	80.8	91.3	62.5	dry	73.8	75.3	108.2	58.3								
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	dry	9.63	10.73	11.7	5.98								
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	dry	6.43	5.8	6.82	6.92								
ORP	nsl	47	78	73	72	99	68	147	98	94	89	dry	Nm	Nm	Nm	Nm								
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	dry	2.24	0.66	2.19	3.4								
Alkalinity	< 300	40	40	40	0	0	0	100	100	100	100	dry	100	100	100	100								
Chlorine, Free	< 4	0	0	0	0	0	0	0	0	0	0	dry	0	0	0	0								
Chlorine, Total	< 4	0	0	0	0	0	0	0	0	0	0	dry	0	0	0	0								
Hardness	nsl	100	100	0	0	40	0	40	20	40	40	dry	20	40	40	40								
Velocity (ft/s)	nsl	0.08	0.06	0.19	0.16	Na	0.04	0.15	0.31	0.18	0.17	dry	0.478	0.107	0.26	0.04								



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

Station #	Favorable Conditions for Brook/Stream/Tributary	ST 561 DOWN		Unnamed Stream																					
Plan #																									
Direction of Flow				PLAN 57																					
Type				north				intermittent																	
Date		30-Aug	30-Sep	29-Oct	30-Nov	23-Dec	19-Jan	23-Feb	18-Mar	22-Apr	23-May	24-Jun	27-Jul	25-Aug	23-Sep	28-Oct	21-Nov	21-Dec	30-Jan	24-Feb	24-Mar	20-Apr			
Temperature (°C)		< 20	20.14	14.10	7.61	1.17	0.19	0.27	6.79	12.42	14.56	20.3	dry	dry	dry	dry	dry	dry	3.61	0.84	9.12	14.21			
Specific Conductance ( $\mu\text{S}/\text{cm}$ at 25°C)	150-500	350	338	252	311	245	281	497	431	567	835	dry	424	444	478	474									
Specific Conductance ( $\mu\text{S}/\text{cm}$ )	150-500	318	268	168	168	129	149	324	327	454	750	dry	251	239	213	386									
Dissolved Oxygen (%)	nsl	37	62	62	76	85	44	63.6	74.4	85	67.8	dry	69.5	77.7	110.3	58.1									
Dissolved Oxygen (mg/L)	> 6	3.36	5.34	7.28	10.78	12.28	6.29	7.74	7.93	8.61	6.4	dry	9.18	11.03	12.4	5.96									
pH	6.5-8.3	6.7	7.0	7.3	7.2	6.5	6.7	6.9	7.1	7.26	7.45	dry	6.15	5.9	6.92	6.84									
ORP	nsl	53	70	52	46	79	95	131	116	92.2	48	dry	Nm	Nm	Nm	Nm									
Turbidity (NTU)	Free from turbidity that would impair fish habitat		1.87	1.90	3.27	1.90	1.73	1.67	1.89	1.85	2.3	4.2	dry	1.04	1.12	2.1	3.5								
Alkalinity	< 300	40	40	40	100	0	0	0	100	100	100	dry	100	100	100	100									
Chlorine, Free	< 4	0	0	0	0	0	0	0	0	0	0	dry	0	0	0	0									
Chlorine, Total	< 4	0	0	0	0	0	0	0	0	0	0	dry	0	0	0	0									
Hardness	nsl	100	100	0	40	0	0	0	20	20	40	dry	20	40	40	40									
Velocity (ft/s)	nsl	0.1	0.13	0.45	0.37	Na	0.04	0.28	0.12	0.2	0.12	dry	0.574	0.081	0.31	0.08									



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

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

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

Station #	Favorable Conditions	ST 700 UP																				
Brook/Stream/Tributary	for Cold Water Fisheries	Hop Brook Tributary																				
Plan #		PLAN 61																				
Direction of Flow		East																				
Type		intermittent																				
Date		30-Aug	30-Sep	29-Oct	30-Nov	23-Dec	19-Jan	23-Feb	18-Mar	22-Apr	23-May	24-Jun	27-Jul	25-Aug	23-Sep	28-Oct	21-Nov	21-Dec	30-Jan	24-Feb	24-Mar	20-Apr
Temperature (°C)	< 20	21.13	16.14	9.67	7.56	6.43	4.49	6.79	8.15	16.21	26	dry	dry	dry	13.88	11.4	dry	0.08	2.91	1.09	10.96	14.52
Specific Conductance ( $\mu\text{S}/\text{cm}$ @ 25°C)	150-500	1362	1129	1104	1110	1079	1689	2225	3094	2398	10112	dry	dry	dry	946	900	dry	942	1756	3320	1786	1482
Specific Conductance ( $\mu\text{S}/\text{cm}$ )	150-500	1263	938	702	742	697	1027	1450	2098	1909	9978	dry	dry	dry	728	750	dry	501	1009	1750	1294	1204
Dissolved Oxygen (%)	nsl	43	41	52	51	56	61	84.2	49.6	76.3	39.5	dry	dry	dry	48.9	46.8	dry	48.9	64.3	75.1	89.4	116.8
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	dry	dry	dry	4.6	4.57	dry	6.71	8.67	10.36	9.73	10.71
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	dry	dry	dry	7.6	6.7	dry	7.9	6.9	6.1	6.51	6.58
ORP	nsl	62	10	20	29	15	70	56.3	55	65	20	dry	dry	dry	105	82	dry	139	Nm	Nm	Nm	Nm
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	dry	dry	dry	3.7	5.1	dry	7.56	7.98	6.43	5.62	6.73
Alkalinity	< 300	40	80	40	250	0	100	250	250	100	250	dry	dry	dry	100	100	dry	100	100	100	100	100
Chlorine, Free	< 4	0	0	0	0	0	0	0	0	0	0	dry	dry	dry	0	0	dry	0	0	0	0	0
Chlorine, Total	< 4	0	0	0	0	0	0	0	0	0	0	dry	dry	dry	0	0	dry	0	0	0	0	0
Hardness	nsl	100	100	100	80	40	40	40	80	40	40	dry	dry	dry	40	40	dry	40	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	dry	dry	dry	0.02	0.03	dry	0.02	0.05	0.05	0.09	0.03



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

Station #	Favorable Conditions for Cold Water Fisheries	ST 710 DOWN																				
Brook/Stream/Tributary		Hop Brook Tributary																				
Plan #		PLAN 63																				
Direction of Flow		East																				
Type		intermittent																				
Date		30-Aug	30-Sep	29-Oct	30-Nov	23-Dec	19-Jan	23-Feb	18-Mar	22-Apr	23-May	24-Jun	27-Jul	25-Aug	23-Sep	28-Oct	21-Nov	21-Dec	30-Jan	24-Feb	24-Mar	20-Apr
Temperature (°C)		< 20	21.08	14.28	9.55	0.40	0.01	frozen	8.55	11.06	15.44	24	dry	dry	13.94	11.35	dry	0.03	2.68	1.67	10.8	14.34
Specific Conductance ( $\mu\text{S}/\text{cm}$ at 25°C)	150-500	1122	755	927	1054	1108	frozen	2215	3268	2228	10068	dry	dry	878	1260	dry	955	1731	3000	1734	1466	
Specific Conductance ( $\mu\text{S}/\text{cm}$ )	150-500	1039	600	653	559	580	frozen	1520	2409	1822	9630	dry	dry	677	867	dry	495	992	1680	1265	1169	
Dissolved Oxygen (%)	nsl	37	49	61	59	73	frozen	54.8	57.4	82.5	46.8	dry	dry	53.5	24.3	dry	52.3	65.5	75	95.1	122.9	
Dissolved Oxygen (mg/L)	> 6	3.30	4.97	6.87	8.52	10.51	frozen	6.35	6.25	8.18	4.2	dry	dry	5.61	2.8	dry	7.66	8.83	10.35	10.46	12.55	
pH	6.5-8.3	6.8	6.9	6.8	6.5	6.5	frozen	6.8	6.94	7.3	7.6	dry	dry	7.54	6.76	dry	7.8	6.9	6.0	6.52	6.7	
ORP	nsl	66	51	25	72	60	frozen	92.4	98	79	10	dry	dry	110	72.7	dry	410	Nm	Nm	Nm	Nm	
Turbidity (NTU)	Free from turbidity that would impair fish habitat		11.50	9.48	6.62	6.00	3.82	frozen	3.98	7.25	23	5.7	dry	dry	3.65	4.58	dry	6.42	7.47	5.69	5.1	5.06
Alkalinity	< 300	100	120	40	100	0	frozen	100	250	100	100	dry	dry	100	100	dry	100	100	100	100	100	
Chlorine, Free	< 4	0	0	0	0	0	frozen	0	0	0	0	dry	dry	0	0	dry	0	0	0	0	0	
Chlorine, Total	< 4	0	0	0	0	0	frozen	0	0	0	0	dry	dry	0	0	dry	0	0	0	0	0	
Hardness	nsl	100	100	100	40	20	frozen	40	40	40	40	dry	dry	40	40	dry	40	40	40	40	40	
Velocity (ft/s)	nsl	0.08	0.02	0.07	0.02	Na	frozen	0.18	0.2	0.02	0.08	dry	dry	0.06	0.04	dry	0.06	0.05	0.145	0.13	0.06	

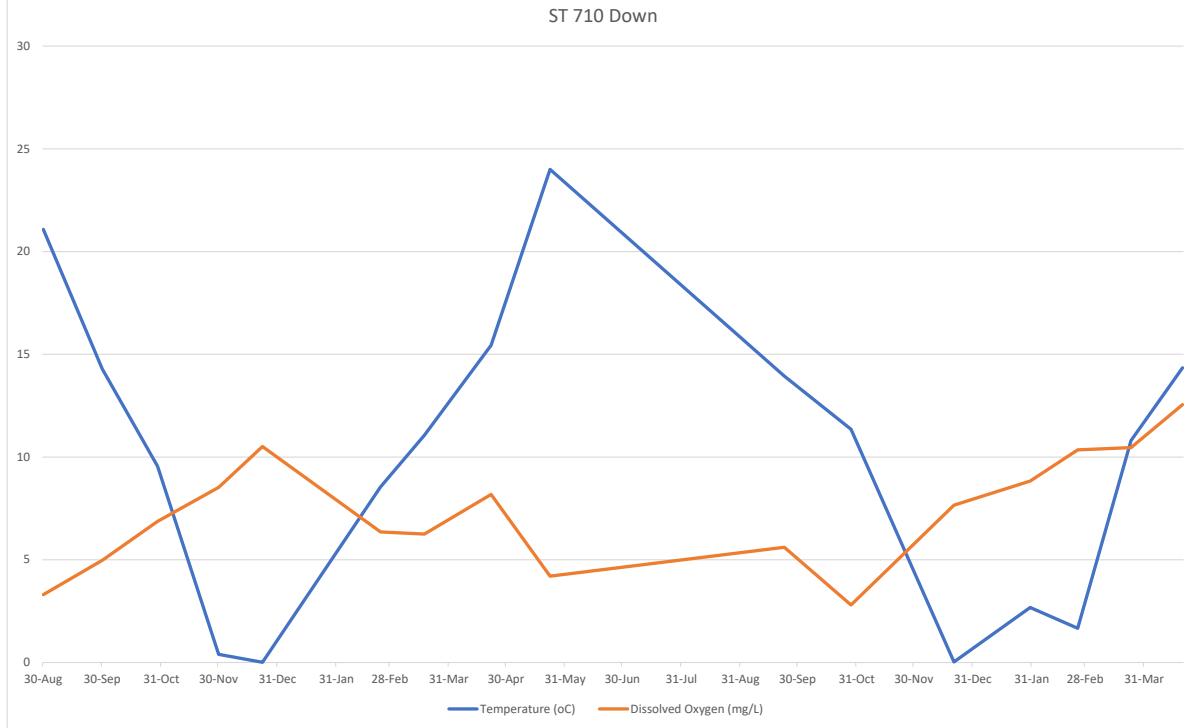


Table 3: Cold Water Fisheries Monitoring Results  
Sudbury to Hudson Reliability Project

Station #	Favorable Conditions for Cold Water Fisheries	ST 725 UP																					
Brook/Stream/Tributary		Hop Brook																					
Plan #		PLAN 65																					
Direction of Flow		south																					
Type		perennial																					
Date		30-Aug	30-Sep	29-Oct	30-Nov	23-Dec	19-Jan	23-Feb	18-Mar	22-Apr	23-May	24-Jun	27-Jul	25-Aug	23-Sep	28-Oct	21-Nov	21-Dec	30-Jan	24-Feb	24-Mar	20-Apr	
Temperature (°C)	< 20	20.55	14.52	7.67	1.17	0.54	0.05	6.3	8.9	12.12	22.2	18.63	21.51	21.36	14.26	10.28	1.17	0.12	2.6	2.23	8.99	10.1	
Specific Conductance (µS/cm @ 25°C)	150-500	393	355	380	309	358	487	789	653	726	817	750	777	807	658	650	738	520	655	547	493	589	
Specific Conductance (µS/cm)	150-500	360	284	254	168	190	255	507	452	548	773	659	725	750	523	475	402	273	375	311	338	420	
Dissolved Oxygen (%)	nsl	75	87	94	95	97	105	82.8	83	94	85.9	68.9	67.6	67.3	69.9	74.6	84.3	83	84.8	87.1	84.8	82.7	
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	6.43	5.93	5.95	7.15	8.32	11.9	12.07	11.48	11.93	9.82	9.32	
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	6.8	7.63	7.2	6.8	6.8	7.2	6.72	6.5	6.91	6.62		
ORP	nsl	97	96	88	81	94	35	88.5	121	116	91	Ns	134	100	140	127	Nm	215	Nm	Nm	Nm	Nm	
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	4.59	2.42	3.52	2.29	2.44	2.98	3.08	1.96	1.98	2.46	3.69
Alkalinity	< 300	40	0	0	100	0	0	0	0	100	100	100	100	100	100	100	100	100	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	0	
Chlorine, Total	< 4	0	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	40	40	40	80	40	40	40	0	40	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	0.06	0.1	0.18	0.2	0.27	0.027	0.17	0.19	0.462	0.37	0.24	

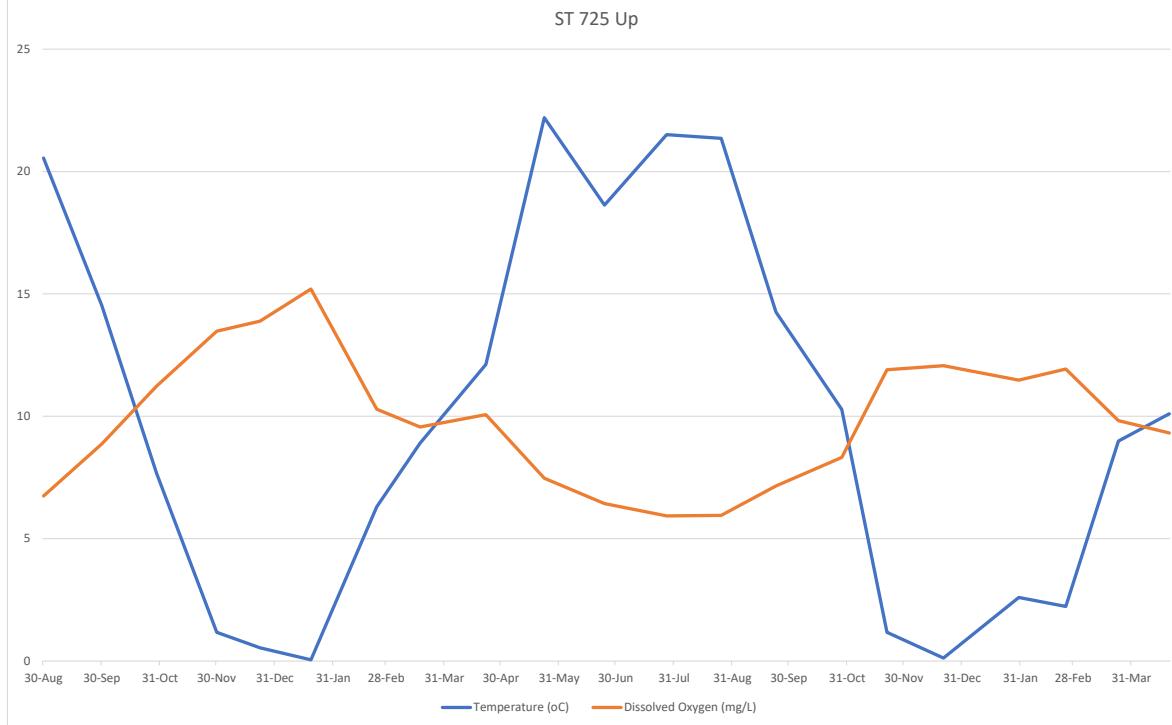


Table 3: Cold Water Fisheries Monitoring Results  
Sudbury to Hudson Reliability Project

Station #	Favorable Conditions for Brook/Stream/Tributary	ST 725 DOWN																								
Plan #	Cold Water Fisheries	Hop Brook																								
Direction of Flow		PLAN 65																								
Type		south																								
Date		30-Aug	30-Sep	29-Oct	30-Nov	23-Dec	19-Jan	23-Feb	18-Mar	22-Apr	23-May	24-Jun	27-Jul	25-Aug	23-Sep	28-Oct	21-Nov	21-Dec	30-Jan	24-Feb	24-Mar	20-Apr				
Temperature (°C)		< 20	20.49	14.45	7.63	1.13	0.51	0.06	4.91	8.81	12.17	22.14	18.57	21.5	21.39	14.23	10.24	1.24	0.06	2.49	2.25	8.89	9.96			
Specific Conductance ( $\mu\text{s}/\text{cm}$ @ 25°C)	150-500	399	360	378	324	358	487	777	658	719	833	767	816	788	681	650	728	540	680	560	495	596				
Specific Conductance ( $\mu\text{s}/\text{cm}$ )	150-500	365	287	253	176	190	255	479	455	543	788	673	760	733	541	467	398	283	388	325	343	425				
Dissolved Oxygen (%)	nsl	80	79	100	102	101	106	74	81.5	93	87	62.4	65.1	65.2	70.6	75.6	83.6	88.1	89.1	87.3	86.1	82.2				
Dissolved Oxygen (mg/L)	> 6	7.20	8.00	11.88	14.37	14.52	15.39	9.44	9.45	9.95	7.57	5.83	5.83	5.77	7.22	8.47	11.78	12.79	12.17	11.96	9.96	9.27				
pH	6.5-8.3	7.2	7.0	7.1	7.2	7.2	7.3	7.1	7.6	7.78	7.98	6.8	7.61	7.25	6.8	6.8	6.8	7	7.07	6.5	6.94	6.68				
ORP	nsl	98	98	80	76	92	29	128	124	122.2	89	Ns	140.3	110	120	120	Nm	51	Nm	Nm	Nm	Nm	Nm			
Turbidity (NTU)	Free from turbidity that would impair fish habitat.		2.63	2.19	3.05	2.25	2.21	2.40	2.76	1.19	0.94	3.22	1.52	2.3	3.89	1.92	2.3	3.45	3.62	1.92	2.41	1.94	3.25			
Alkalinity	< 300	40	0	0	100	0	0	100	100	100	100	100	100	100	100	100	100	100	100	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	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	0	0	0		
Hardness	nsl	100	0	0	0	0	0	0	20	40	40	40	40	80	40	40	40	40	0	40	40	40	40			
Velocity (ft/s)	nsl	0.08	0.13	0.17	0.28	Na	0.3	0.28	0.25	0.35	0.27	0.1	0.16	0.11	0.22	0.23	0.038	0.32	0.558	0.42	0.4	0.28				

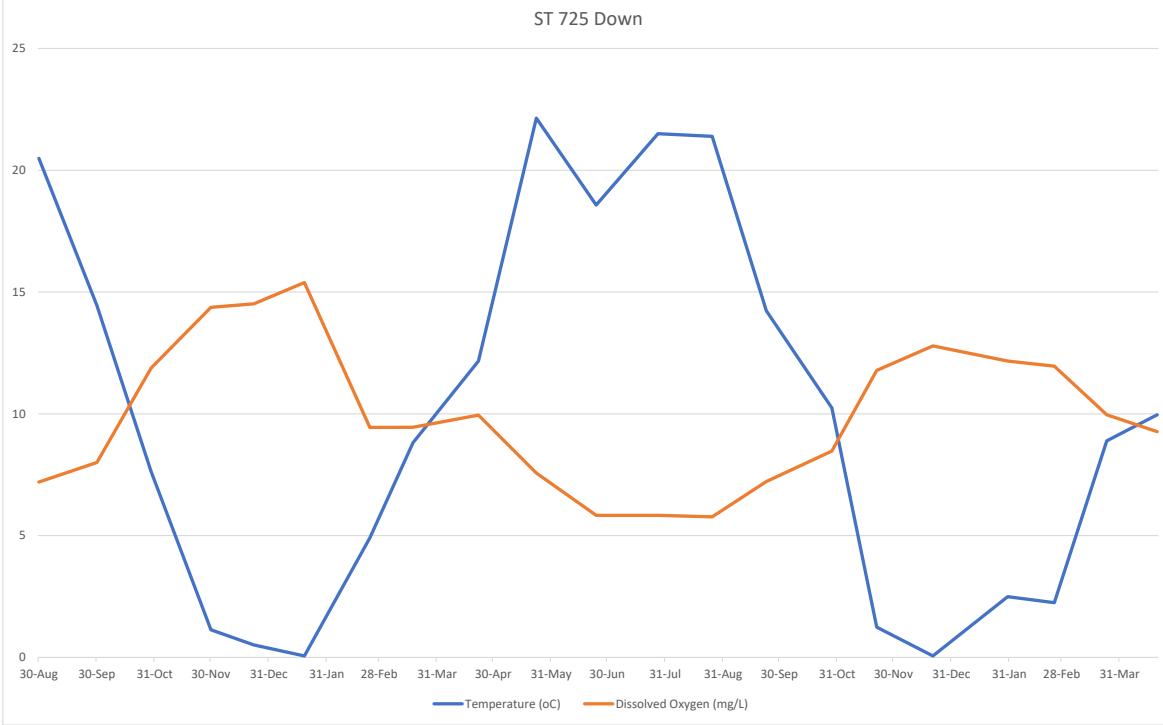


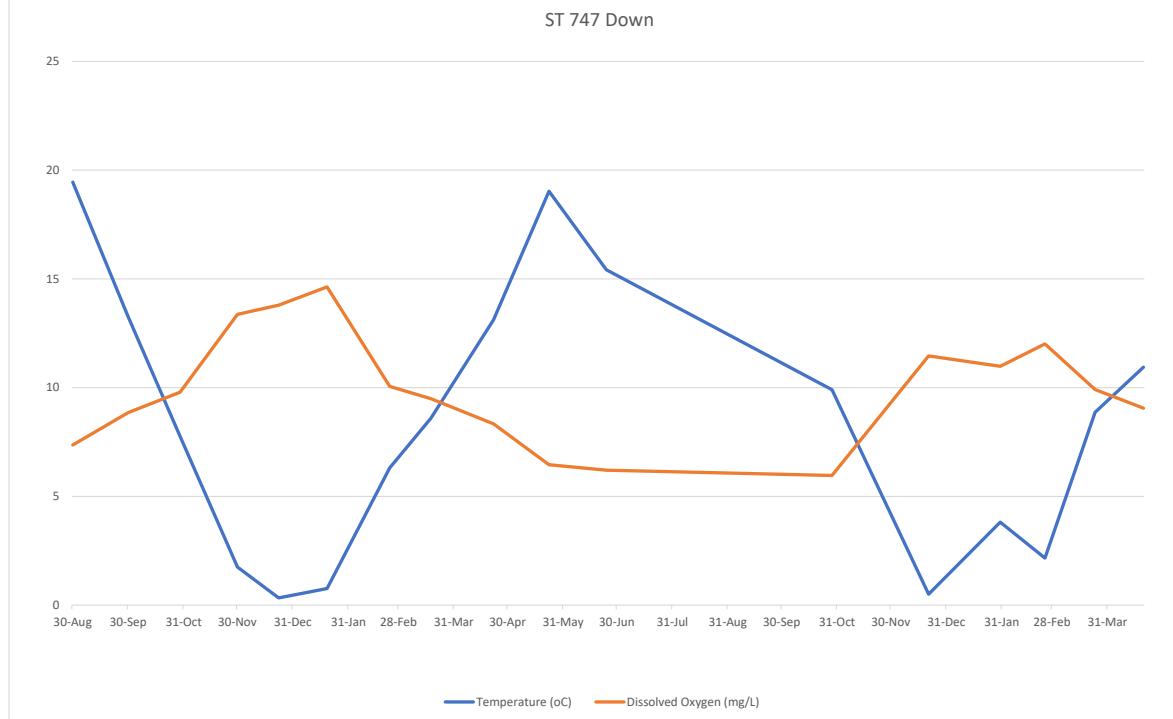
Table 3: Cold Water Fisheries Monitoring Results  
Sudbury to Hudson Reliability Project

Station #	Favorable Conditions for Cold Water Fisheries	ST 747 UP																									
Brook/Stream/Tributary		Wash Brook Tributary																									
Plan #		PLAN 67																									
Direction of Flow		south																									
Type		intermittent																									
Date		30-Aug	30-Sep	29-Oct	30-Nov	23-Dec	19-Jan	23-Feb	18-Mar	22-Apr	23-May	24-Jun	27-Jul	25-Aug	23-Sep	28-Oct	21-Nov	21-Dec	30-Jan	24-Feb	24-Mar	20-Apr					
Temperature (°C)		< 20	19.39	13.34	7.72	1.94	0.32	0.83	5.04	8.81	12.86	19.02	16.01	dry	dry	dry	9.6	dry	0.6	3.62	2.18	9.11	11.03				
Specific Conductance (µS/cm at 25°C)	150-500	524	418	379	451	377	530	774	626	798	826	832	dry	dry	dry	627	dry	509	595	620	508	661					
Specific Conductance (µS/cm)	150-500	468	325	254	252	200	286	473	432	612	730	689	dry	dry	dry	451	dry	272	352	351	354	485					
Dissolved Oxygen (%)	nsl	91	86	89	92	107	97	73.5	79.6	80.5	72.5	67	dry	dry	dry	54.2	dry	77.5	82.7	87.6	84.3	79.4					
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	6.6	dry	dry	dry	5.87	dry	11.12	10.93	12.03	9.7	8.73					
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	6.8	dry	dry	dry	6.8	dry	7.6	6.67	6.3	6.79	7.32					
ORP	nsl	58	60	80	59	76	-15	124	98	92	101	Ns	dry	dry	dry	102	dry	340	Nm	Nm	Nm	Nm					
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	2.42	dry	dry	dry	1.67	dry	0.29	1.48	0.96	2.35	2.45				
Alkalinity	< 300	80	40	40	100	0	0	100	100	100	100	100	dry	dry	dry	100	dry	100	100	100	100	100					
Chlorine, Free	< 4	0	0	0	0	0	0	0	0	0	0	0	dry	dry	dry	0	dry	0	0	0	0	0					
Chlorine, Total	< 4	0	0	0	0	0	0	0	0	0	0	0	dry	dry	dry	0	dry	0	0	0	0	0					
Hardness	nsl	100	100	100	40	20	40	40	40	40	40	40	dry	dry	dry	40	dry	40	40	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	0.03	dry	dry	dry	0.14	dry	0.38	0.245	0.539	0.44	0.24					



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

Station #	Favorable Conditions for Brook/Stream/Tributary	ST 747 DOWN																						
Plan #		Wash Brook Tributary																						
Direction of Flow		PLAN 67	south																					
Type		intermittent																						
Date		30-Aug	30-Sep	29-Oct	30-Nov	23-Dec	19-Jan	23-Feb	18-Mar	22-Apr	23-May	24-Jun	27-Jul	25-Aug	23-Sep	28-Oct	21-Nov	21-Dec	30-Jan	24-Feb	24-Mar	20-Apr		
Temperature (°C)		< 20	19.45	13.26	7.76	1.75	0.33	0.76	6.31	8.59	13.12	19.03	15.42	dry	dry	dry	9.9	dry	0.5	3.81	2.16	8.87	10.94	
Specific Conductance (µS/cm at 25°C)	150-500	495	451	382	453	403	532	803	643	795	875	836	dry	dry	dry	647	dry	532	575	617	561	668		
Specific Conductance (µS/cm)	150-500	443	350	256	252	213	285	516	441	614	775	683	dry	dry	dry	460	dry	283	342	348	388	488		
Dissolved Oxygen (%)	nsl	80	85	82	96	95	103	81.8	81.6	79.5	69.8	62.3	dry	dry	dry	53	dry	79.8	83.4	87.5	85.7	82.3		
Dissolved Oxygen (mg/L)	> 6	7.36	8.85	9.79	13.37	13.79	14.63	10.06	9.49	8.33	6.45	6.2	dry	dry	dry	5.96	dry	11.46	10.98	12.01	9.91	9.05		
pH	6.5-8.3	7.0	6.8	6.5	7.3	7.1	7.8	7.07	7.77	7.55	7.58	6.8	dry	dry	dry	6.7	dry	7.12	6.6	6.4	7.36	7.43		
ORP	nsl	73	75	84	57	82	21	25.5	106	94	91.1	Ns	dry	dry	dry	100	dry	368	Nm	Nm	Nm	Nm		
Turbidity (NTU)	Free from turbidity that would impair fish habitat		0.79	1.87	1.81	1.82	1.77	2.27	2.21	1.56	1.11	2.9	1.92	dry	dry	dry	1.9	dry	0.18	0.46	1.02	1.83	2.37	
Alkalinity	< 300	80	40	40	100	0	0	0	100	100	100	100	dry	dry	dry	100	dry	100	100	100	100	100		
Chlorine, Free	< 4	0	0	0	0	0	0	0	0	0	0	0	dry	dry	dry	0	dry	0	0	0	0	0		
Chlorine, Total	< 4	0	0	0	0	0	0	0	0	0	0	0	dry	dry	dry	0	dry	0	0	0	0	0		
Hardness	nsl	100	100	100	40	40	40	0	40	40	40	40	dry	dry	dry	40	dry	40	40	40	40	40		
Velocity (ft/s)	nsl	0.07	0.1	0.2	0.17	Na	0.06	0.39	0.31	0.46	0.22	0.06	dry	dry	dry	0.13	dry	0.36	0.305	0.213	0.18	0.2		



## **APPENDIX C**

### **Field Logs**

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	Summary of Field Monitoring (pg 1/3)									
	Feb-23									
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	36	FH	2/24/2023	Downgradient	light_tea	none	From Bridge	Open Channel
ST 400 up	Hop brook	partly_cloudy	36	FH	2/24/2023	Upgradient	light_tea	none	From Bridge	Open Channel
ST 527 down	Unnamed	partly_cloudy	36	FH	2/24/2023	Downgradient	dark_tea	none	From Headwall	Open Channel
ST 527 up	Unnamed	partly_cloudy	36	FH	2/24/2023	Upgradient	dark_tea	none	From Headwall	Open Channel
ST 540 down	Dudley brook	partly_cloudy	36	FH	2/24/2023	Downgradient	dark_tea	none	From Headwall	Open Channel
ST 540 up	Dudley Brook	partly_cloudy	36	FH	2/24/2023	Upgradient	dark_tea	none	From Headwall	Open Channel
ST 561 down	Unnamed	partly_cloudy	36	FH	2/24/2023	Downgradient	dark_tea	none	From Headwall	Open Channel
ST 561 up	Unnamed	partly_cloudy	36	FH	2/24/2023	Upgradient	dark_tea	none	From Headwall	Open Channel
ST 593 down	Unnamed	partly_cloudy	36	FH	2/24/2023	Downgradient	Ns	Ns	Ns	Ns
ST 593 up	Unnamed	partly_cloudy	36	FH	2/24/2023	Upgradient	Ns	Ns	Ns	Ns
ST 700 up	Hop Brook tributary	partly_cloudy	36	FH	2/24/2023	Upgradient	cloudy_milky	sewage	From Headwall	Open Channel
ST 710 down	Hop brook tributary	partly_cloudy	36	FH	2/24/2023	Downgradient	dark_tea	none	From Headwall	Open Channel
ST 725 down	Hop Brook	partly_cloudy	36	FH	2/24/2023	Downgradient	dark_tea	none	From Bridge	Open Channel
ST 725 Up	Hop Brook	partly_cloudy	36	FH	2/24/2023	Upgradient	light_tea	none	From Bridge	Open Channel
ST 747 Down	Wash brook tributary	partly_cloudy	36	FH	2/24/2023	Downgradient	light_tea	none	From Bank	Open Channel
ST-747-U	Wash brook tributary	partly_cloudy	36	FH	2/24/2023	Upgradient	light_tea	none	From Bank	Open Channel

	Summary of Field Monitoring (pg2/3)							
	Feb-23							
Stream Point ID	Signs of Flow	Floatables	Condition of Bottom	Survey Comments	Water Temperature	Specific Conductance $\mu\text{S}/\text{cm} @ 25 \text{ Degrees}$	Specific Conductance $\mu\text{S}/\text{cm}$	Dissolved Oxygen %
ST 400 down	Present-Fast	None	sandy	<Null>	0.95	422	227	74.7
ST 400 up	Present-Fast	None	sandy	<Null>	0.96	403	235	74.7
ST 527 down	Present-Slow	None	sandy	<Null>	2.82	341	196	75.9
ST 527 up	Present-Slow	None	mud_clay	<Null>	2.45	334	190	85.3
ST 540 down	Present-Fast	Foam	gravel	<Null>	1.21	446	244	79
ST 540 up	Present-Fast	None	gravel	<Null>	1.15	436	237	77.5
ST 561 down	Present-Slow	None	sandy	<Null>	0.84	444	239	77.7
ST 561 up	Present-Slow	None	gravel	<Null>	0.84	426	229	75.3
ST 593 down	dry	dry	gravel	dry	Ns	Ns	Ns	Ns
ST 593 up	dry	dry	gravel	dry	Ns	Ns	Ns	Ns
ST 700 up	Not Seen	Debris_buildup,Iron	not_visible	<Null>	1.09	3320	1750	75.1
ST 710 down	Present-Slow	None	mud_clay	<Null>	1.67	3000	1680	75
ST 725 down	Present-Slow	None	not_visible	<Null>	2.25	560	325	87.3
ST 725 Up	Present-Slow	Debris_Trash	not_visible	<Null>	2.23	547	311	87.1
ST 747 Down	Present-Slow	None	gravel	<Null>	2.16	617	348	87.5
ST-747-U	Present-Fast	None	sandy	<Null>	2.18	620	351	87.6

	Summary of Field Monitoring (pg 3/3)								
	Feb-23								
Stream Point ID	Dissolved Oxygen mg/L	pH	ORP	Turbidity (NTU)	Hardness	Chlorine_Free	Chlorine_Total	Alkalinity	Velocity (ft/s)
ST 400 down	10.65	7.0 <Null>		2.64	100	0	0	40	1.247
ST 400 up	10.66	6.9 <Null>		2.62	100	0	0	40	1.376
ST 527 down	10.22	5.7 <Null>		0.33	100	0	0	40	0.193
ST 527 up	11.63	5.7 <Null>		0.94	100	0	0	40	0.092
ST 540 down	11.12	6.0 <Null>		0.36	0	0	0	40	1.305
ST 540 up	10.94	6.1 <Null>		0.52	0	0	0	40	1.442
ST 561 down	11.03	5.9 <Null>		1.12	100	0	0	40	0.081
ST 561 up	10.73	5.8 <Null>		0.66	100	0	0	40	0.107
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	1036	6.1 <Null>		6.43	100	0	0	40	0.05
ST 710 down	10.35	6.0 <Null>		5.69	100	0	0	40	0.145
ST 725 down	11.96	6.5 <Null>		2.41	100	0	0	40	0.42
ST 725 Up	11.93	6.5 <Null>		1.98	100	0	0	40	0.462
ST 747 Down	12.01	6.4 <Null>		1.02	100	0	0	40	0.213
ST-747-U	12.03	6.3 <Null>		0.96	100	0	0	40	0.539