



# Results of the Water Quality Monitoring Program for Coldwater Fisheries

## Sudbury to Hudson Reliability Project

### August 2023 – October 2023

NOVEMBER 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  
AUGUST 2023 – OCTOBER 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 and construction phase 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 (August 2023 to October 2023) SWCA monitored these eight locations on August 23, September 28, October 5, 2023, and October 30, 2023. SWCA conducted the additional monitoring on October 5 due to an equipment error that occurred on September 28. Earth disturbance activities began near the monitoring points beginning in January 2023 and have continued through this quarterly monitoring period. 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. 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 decreased in the month of August, decreased again in September and again in October relative to the outside temperatures dropping. Temperatures in August ranged from 15 to 21 degrees Celsius. Temperatures fell to ranges of 15 to 18 degrees Celsius in September. In October the temperatures ranged from 11 to 13 degrees Celsius. The upgradient and downgradient temperature 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 varied in all locations for all three months, with results being both above and below the favorable value of 6 mg/L. Stations 400 U/D, 540 U/D, 561 U/D, 700 U, 710 D, and 725 U/D were < 6 mg/L in the month of August. Stations 561 U/D, 700 U and 710 D were < 6 mg/L in September. The upgradient and downgradient dissolved oxygen 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 most of the pH levels to be slightly below normal ranges for cold water fisheries at 6.5-8.3 for August through October 2023. In August, the only station with pH reading in the normal range was ST 747 D. In September, the stations with pH readings in the normal ranges were ST 561 D, 700 U, 710 D, 725 U/D, and 747 U/D. In October, most stations were within normal ranges except for ST 561 D and ST 527 U/D. The upgradient and downgradient pH 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**

At a majority of the stations for all three monitoring events, the specific conductivity (at 25 degrees Celsius) readings were within the acceptable range for freshwater fisheries at 150-500 µS/cm. Readings were outside the acceptable range at 400 U/D (August), 700 U (August through October 5), 710 D (August through October 5), 725 U/D (September), and 747 U/D (August through October 5). Stations 700 U and 710 D were at significantly higher than the acceptable range, with readings above 1000 µS/cm for all three months, with the exception of October 30. However, these results correlate with previous monitoring results at this station. Further, 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 August 2023 through October 2023, turbidity levels at each station were observed to be less than 5 NTUs in all locations other than Stations 561 U/D (August), 725 D (October 5), 747 U (October 5)/D (October 30), 700 U and 710 D (all three months) at the Hop Brook Tributary. Within this Hop Brook 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.
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**APPENDIX A**

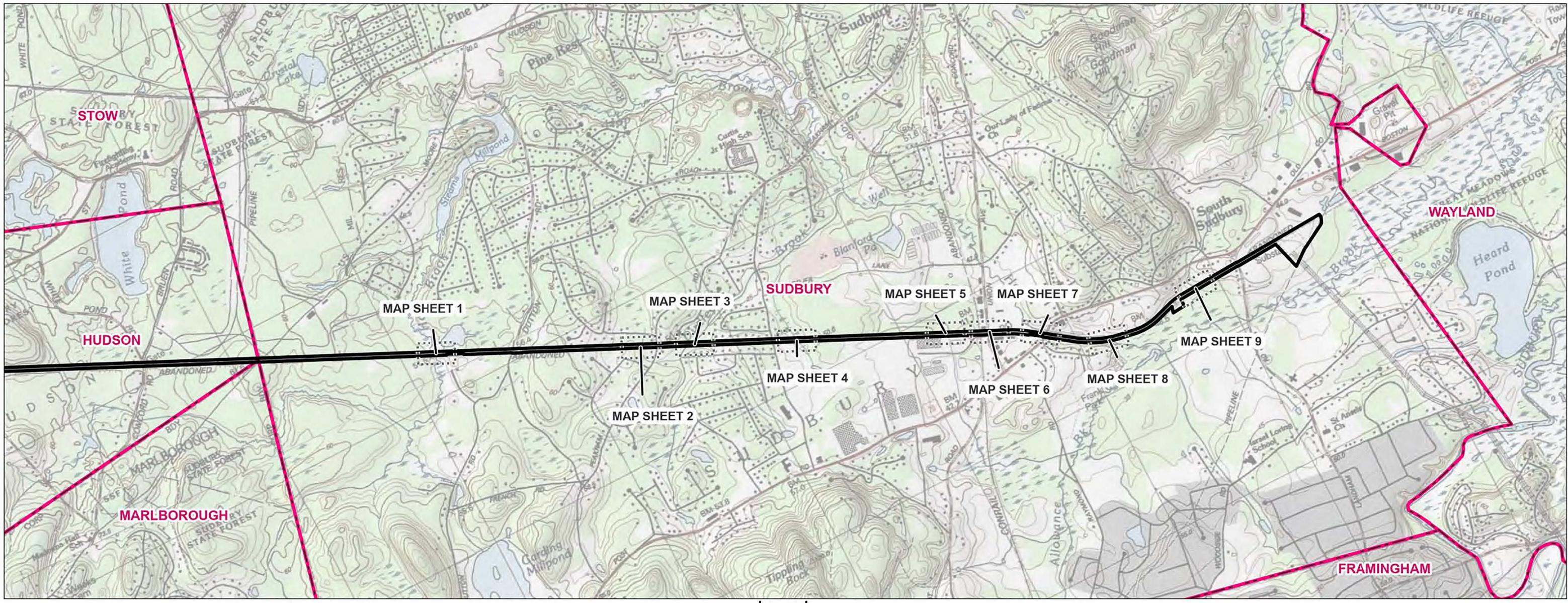
**Figures Map Book**

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# 2021 - Sudbury Hudson Reliability Project

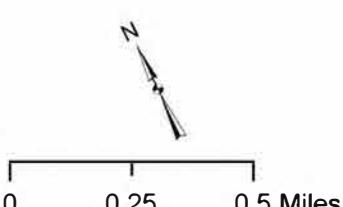
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Water Sampling Map

Date: August 11, 2021



## Legend

..... Map Sheet Matchline



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

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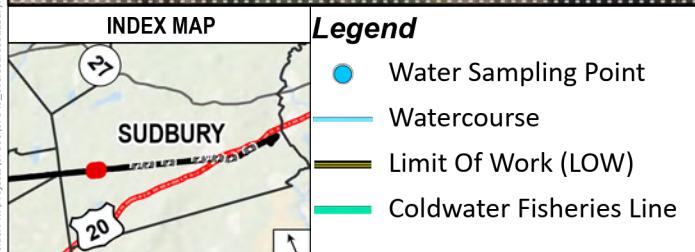
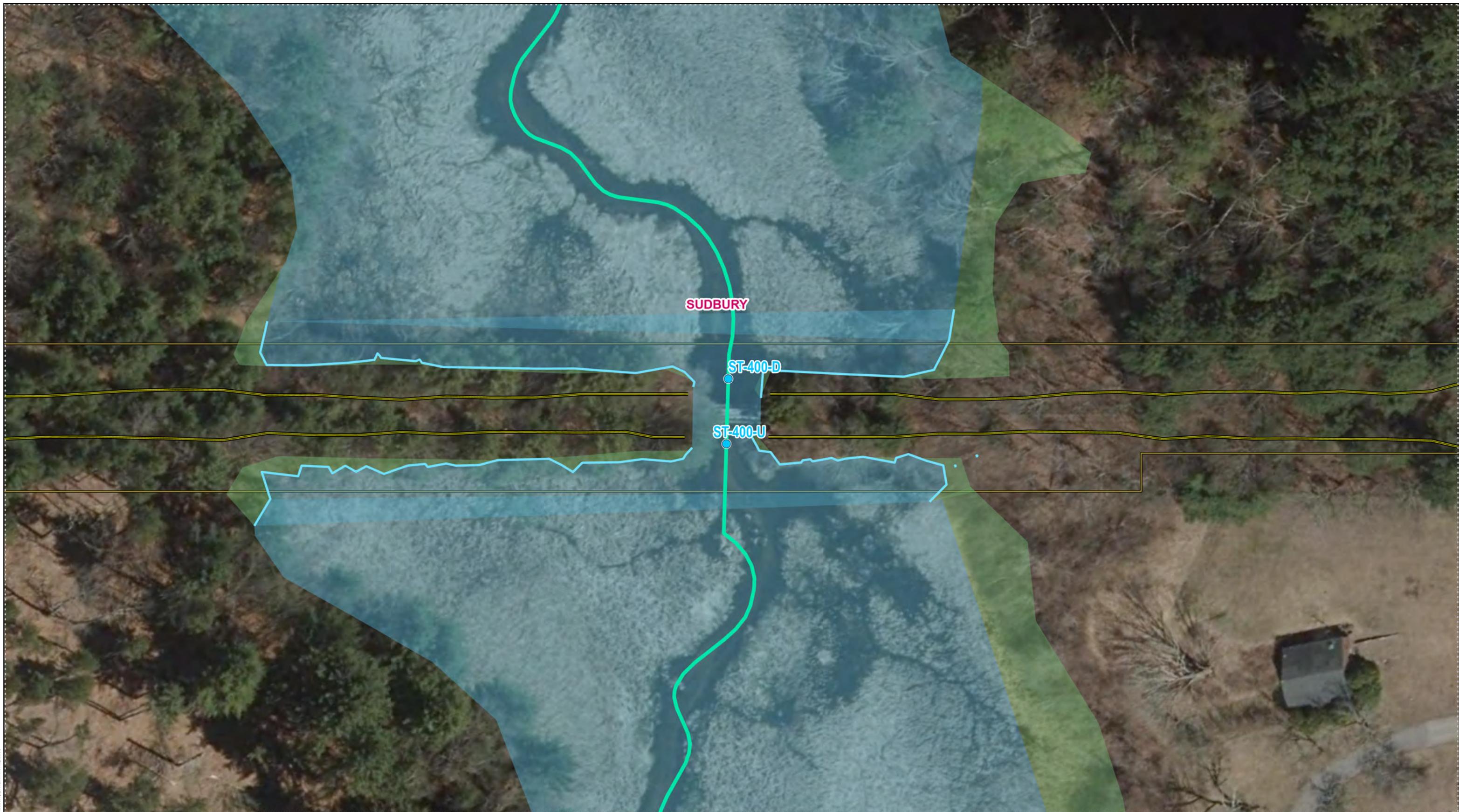
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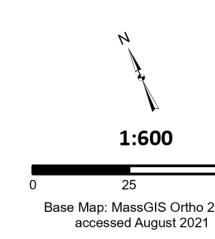
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PREPARED BY:

**SWCA**  
ENVIRONMENTAL CONSULTANTS  
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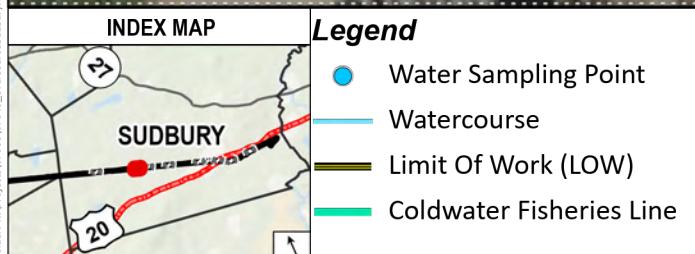


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  - Existing Right-of-Way (ROW)
  - Municipal Boundary



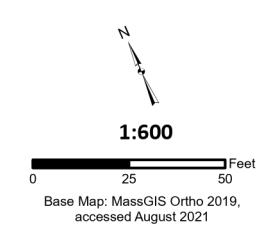
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SUDBURY, MA		MAP SHEET 1 OF 9		
Date: August, 2021				
NO.	DATE	REVISIONS		

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**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



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accessed August 2021

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Water Sampling Map**

SUDSBURY, MA

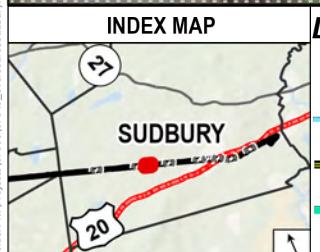
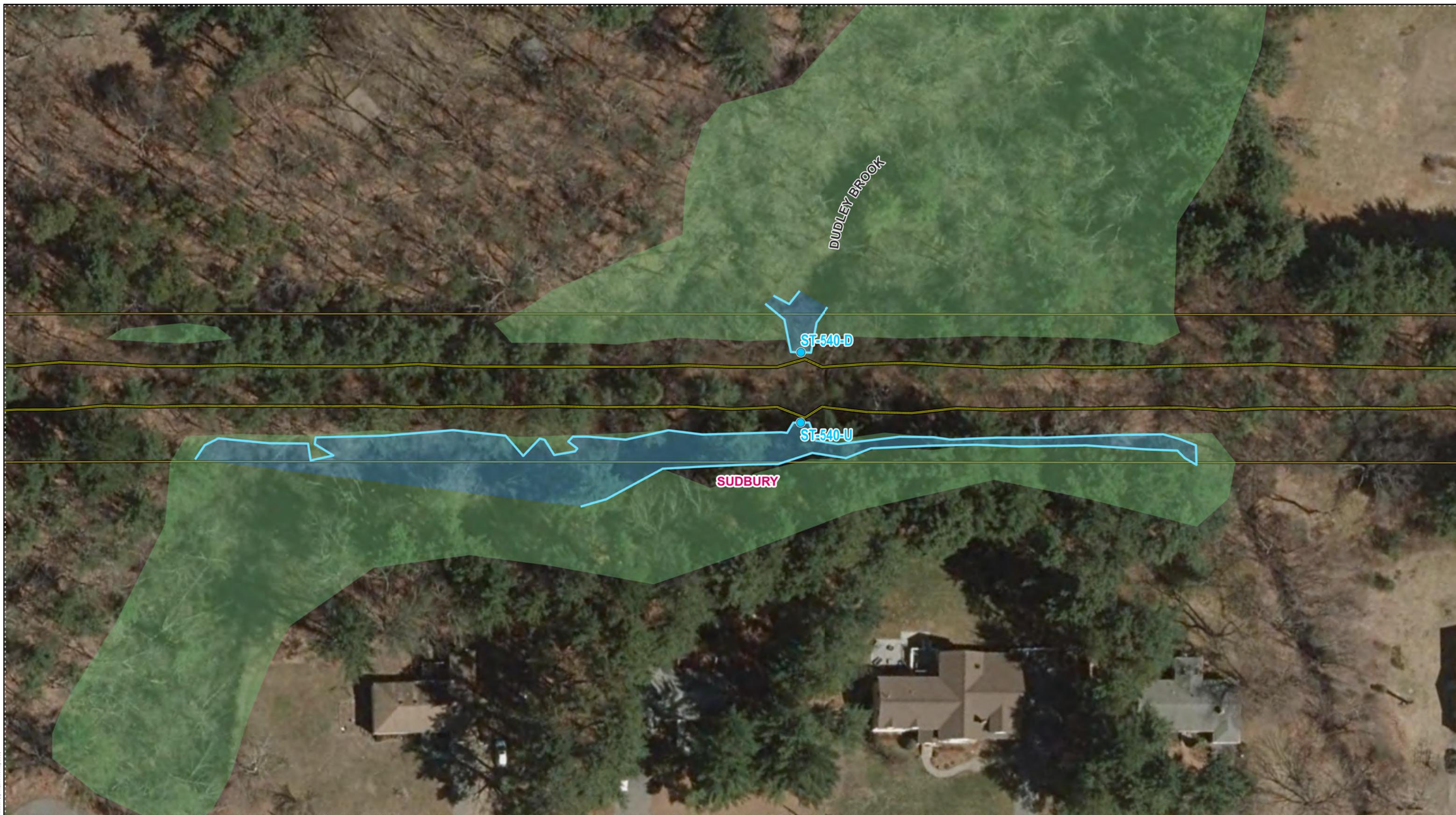
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Date: August, 2021

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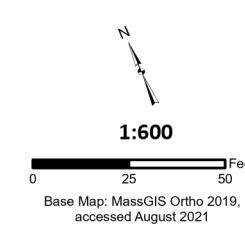
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NO. DATE REVISIONS

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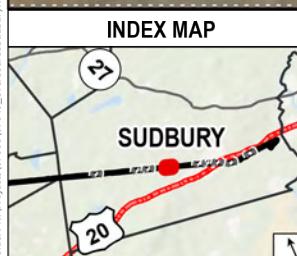
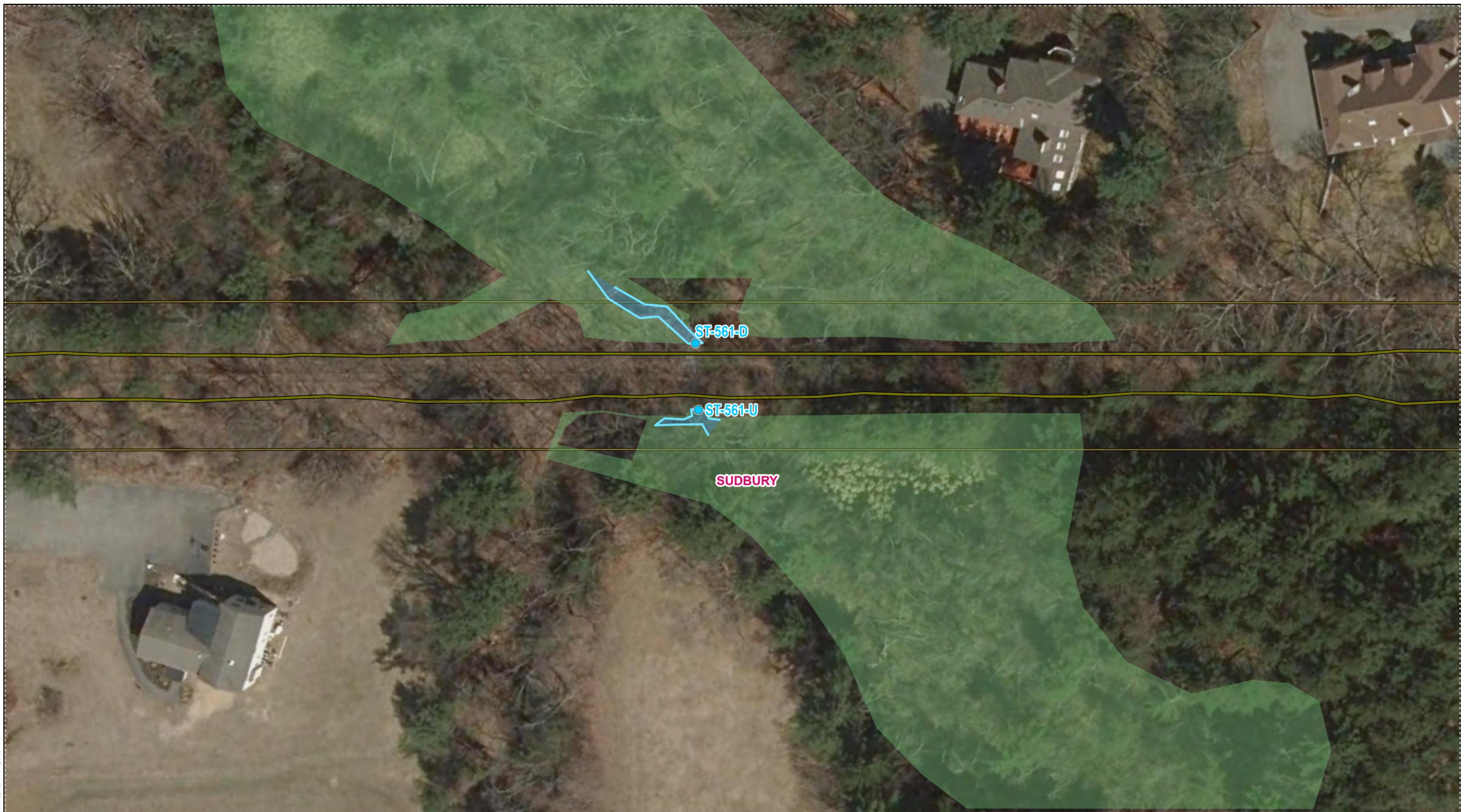
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ENERGYSudbury Hudson Reliability Project  
Water Sampling Map

SUDBURY, MA MAP SHEET 3 OF 9

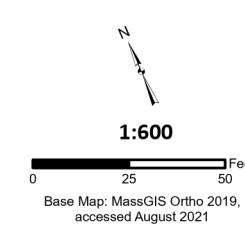
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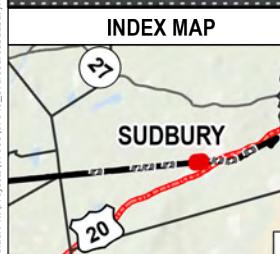
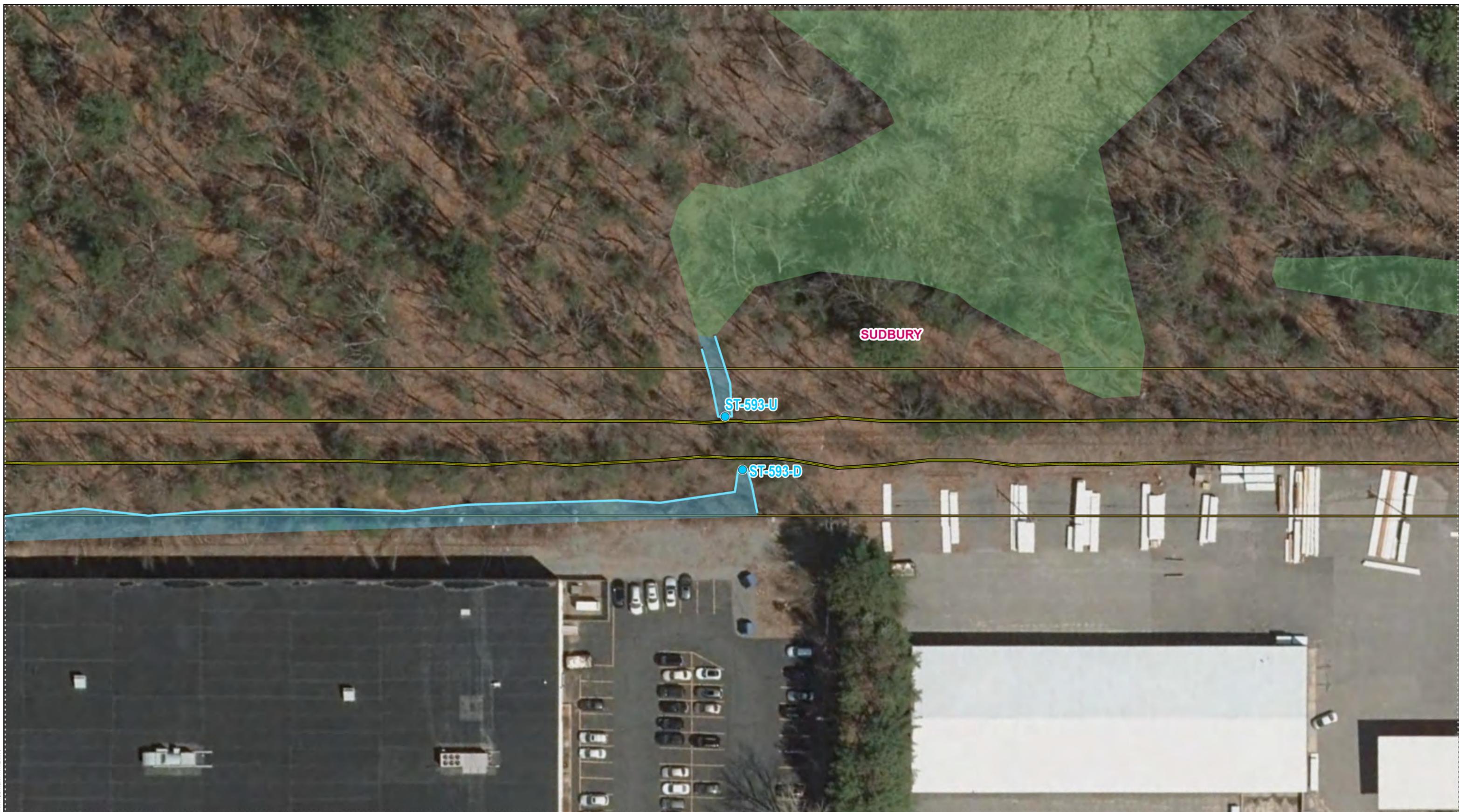
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SUDSBURY, MA MAP SHEET 4 OF 9

Date: August, 2021

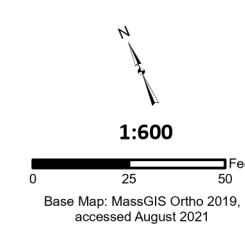
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**Legend**

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- Limit Of Work (LOW)
- Coldwater Fisheries Line

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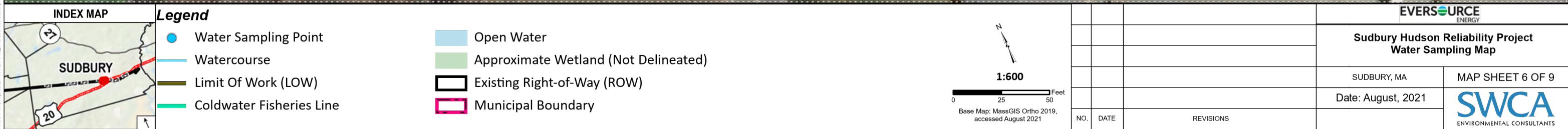
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Water Sampling Map

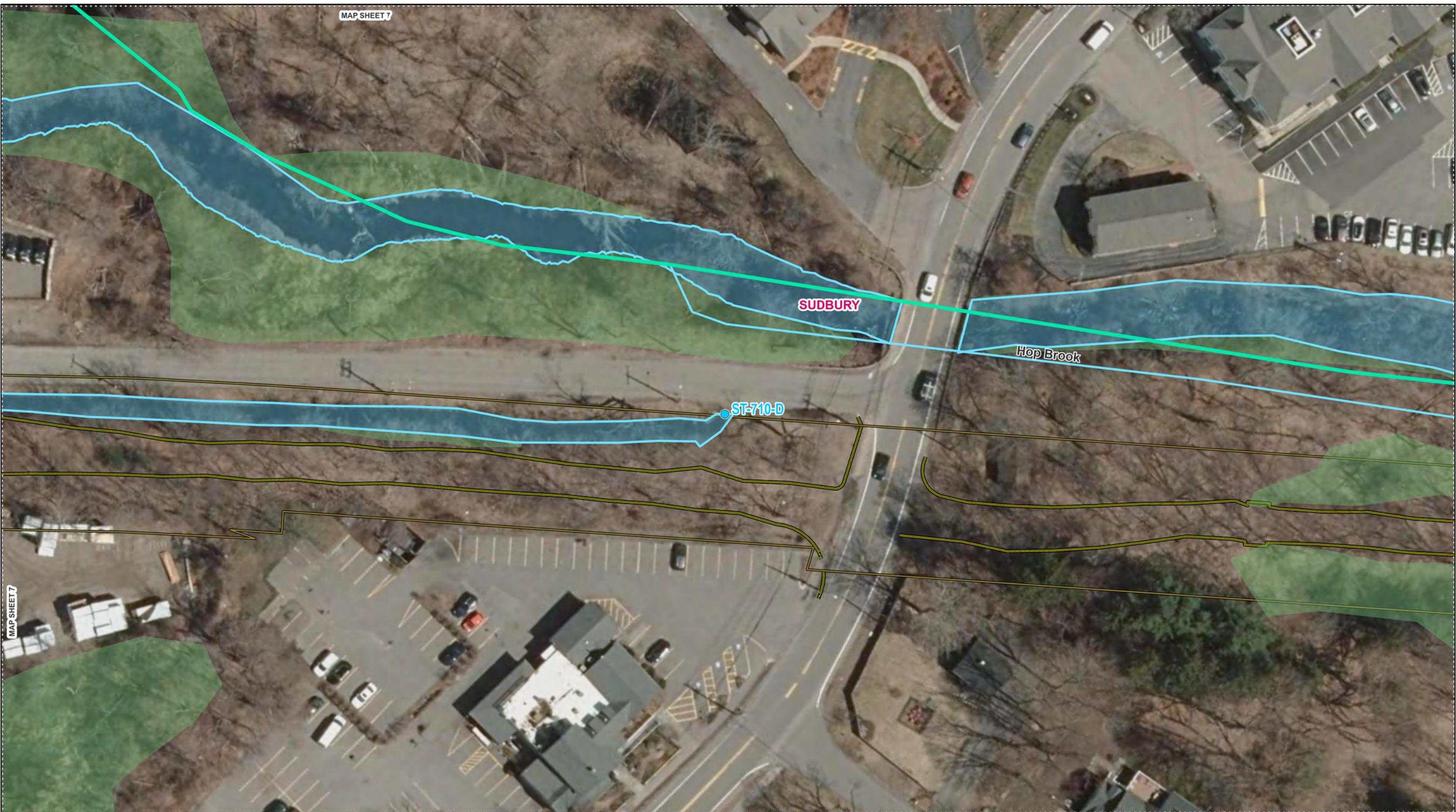
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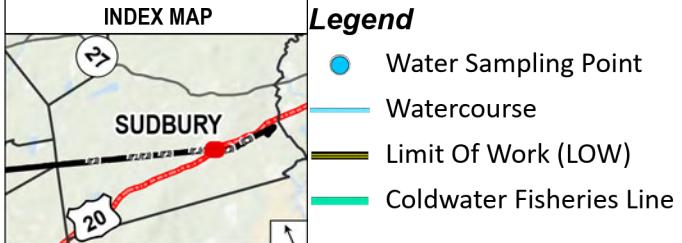
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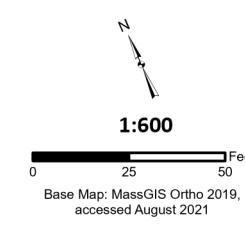




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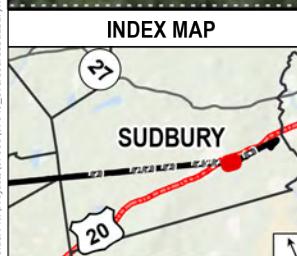
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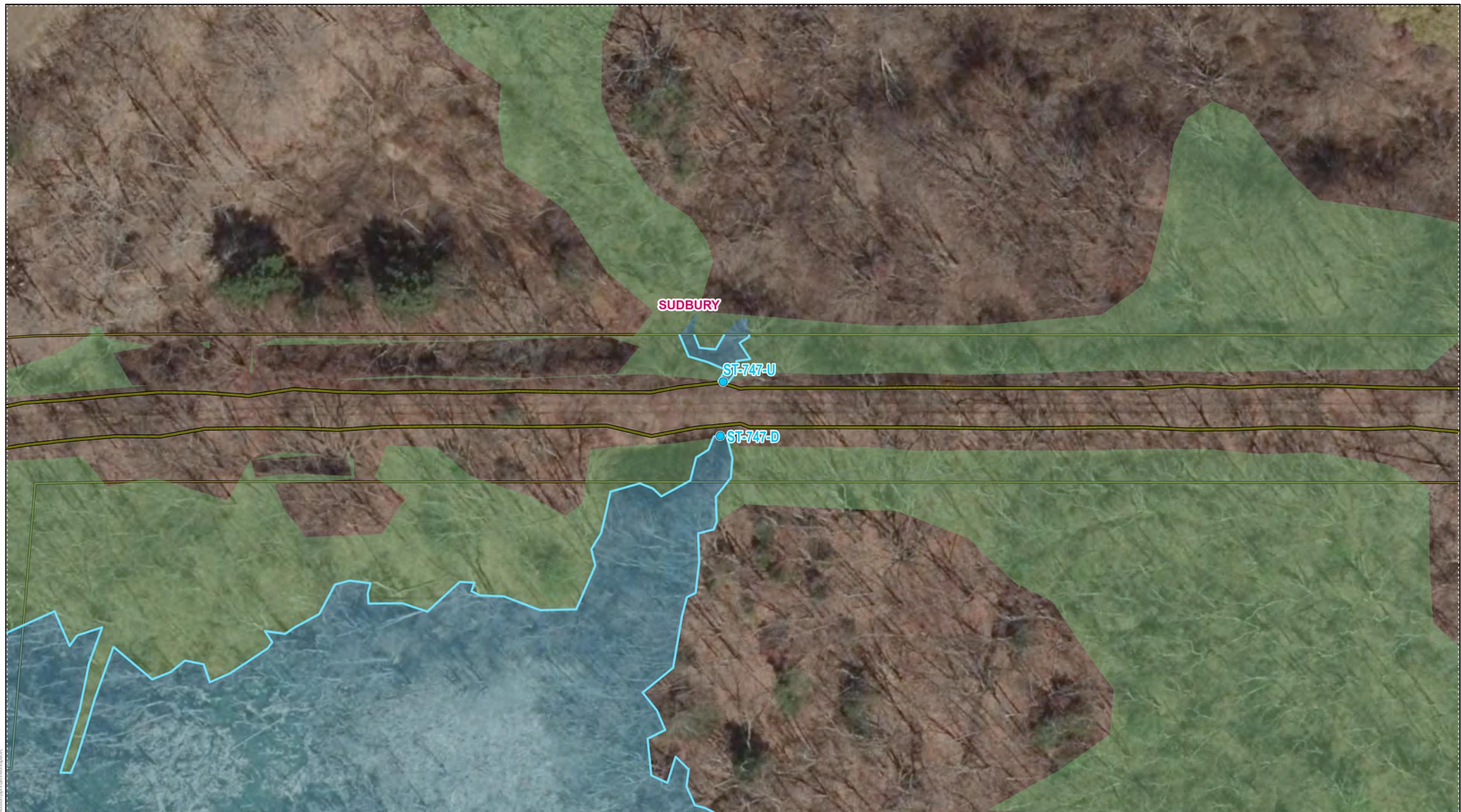
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accessed August 2021

**EVERSOURCE ENERGY**  
Sudbury Hudson Reliability Project  
Water Sampling Map  
SUDSBURY, MA MAP SHEET 8 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 Cold Water Fisheries	ST 400 UP				2021												2022												2023											
Brook/Stream/Tributary		Hop Brook	PLAN 47	south	perennial	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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct								
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	Nm	18.54	24.9	20.98	Nm	18.15	12.35												
Specific Conductance ( $\mu\text{S}/\text{cm} @ 25^\circ\text{C}$ )	150-500	414	422	421	408	410	573	768	730	727	889	771	787	852	666	598	764	572	523	403	503	450	188	634	664	516	Nm	468	386												
Specific Conductance ( $\mu\text{S}/\text{cm}$ )	150-500	393	351	294	235	231	327	496	547	599	880	716	806	813	552	442	432	325	316	235	364	367	470	556	662	476	Nm	405	293												
Dissolved Oxygen (%)	nsi	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	Nm	65.5	68.5	58.9	Nm	72.3	55.2												
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	Nm	6.12	5.66	5.06	Nm	6.79	6.35												
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	8.07	6.56	6.32	6.24	Nm	6.24	6.83												
ORP	nsi	91	94	93	78	104	69	156	144	137	107	73	60	73	85	109	135	34	Nm	Nm	Nm	Nm	610	1246.8	887.9	Nm	Nm	66.4	108.2												
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	3.64	2.33	3.07	4.52	3.15	3.65	1.78												
Hardness	nsi	100	0	0	0	20	0	100	100	100	100	100	100	100	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	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	0	0	0	0	0												
Alkalinity	<300	40	40	0	0	0	0	40	20	40	40	40	40	40	80	40	40	40	40	40	40	40	40	40	40	40	40	40	40												
Velocity (ft/s)	nsi	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	0.602	0.77	0.97	0.77	0.68	Nm	0.61												

Station #	Favorable Conditions for Cold Water Fisheries	ST 400 DOWN				2021												2022												2023											
Brook/Stream/Tributary		Hop Brook	PLAN 47	south	perennial	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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct								
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	Nm	18.52	24.86	20.94	Nm	18.15	12.08												
Specific Conductance ( $\mu\text{S}/\text{cm} @ 25^\circ\text{C}$ )	150-500	415	422	420	408	408	573	775	717	715	868	777	788	877	681	604	761	572	525	422	506	417	190	635	667	516	Nm	463	384												
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	474	556	666	476	Nm	402	289												
Dissolved Oxygen (%)	nsi	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	Nm	63.5	67.5	58.9	Nm	70.3	54.6												
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	Nm	5.95	5.59	5.24	Nm	6.65	6.23												
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	6.8	7.2	6.79	7.0	6.67	6.94	8.05	6.6	6.4	6.25	Nm	6.19	6.64												
ORP	nsi	91	94	93	79	117	119	159	146	142.4	103	60	50	75	86.2	140	140	34	Nm	Nm	Nm	Nm	620	1070.3	957.5	NA	Nm	66.2	120.9												
Turbidity (NTU)	free from turbidity that would impair fish habitat	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	3.55	2.43	2.61	4.68	3.12	3.28	1.47												
Hardness	nsi	100	0	0	0	0	0	100	100	100	100	100	100	100	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	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	0	0	0	0	0												
Alkalinity	<300	40	40	0	0	20	0	40	20	40	40	40	40	40	80	40	40	40	40	40	40	40	40	40	40	40	40	40	40												
Velocity (ft/s)	nsi	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	0.565	0.76	0.93	0.75	0.69	Nm	0.53												

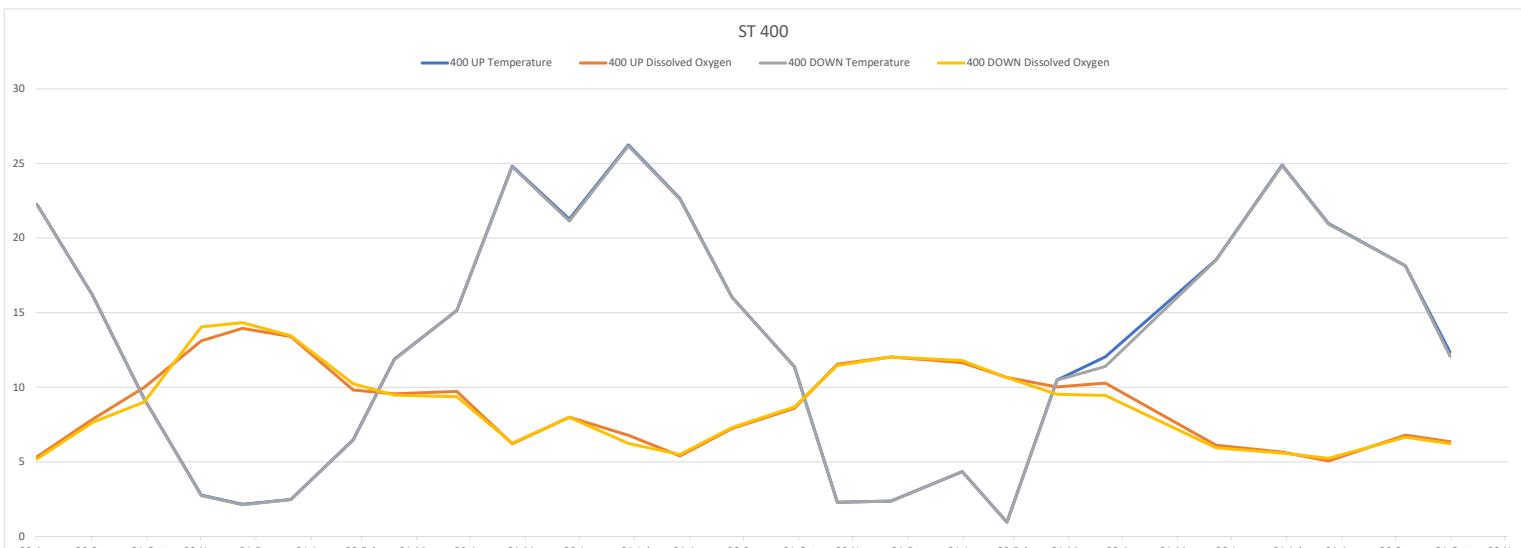


Table 3: Cold Water Fisheries Monitoring Results  
Sudbury to Hudson Reliability Project

Station #	Favorable Conditions for Cold Water Fisheries	ST 527 UP				Unnamed Stream												PLAN 52 south														
Brook/Stream/Tributary		Unnamed Stream				PLAN 52 south																										
Plan #																																
Direction of Flow		PLAN 52 south																														
Type		PLAN 52 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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct			
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	13.5	13.57	17.71	15.57	Nm	15.53	11.25			
Specific Conductance ( $\mu\text{S}/\text{cm}$ @ 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	375	387	451	398	Nm	366	262			
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	292	302	388	326	Nm	300	193			
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	81.6	61.1	62.2	61.9	Nm	70.9	66.9			
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	6.38	dry	dry	7.03	5.13	8.91	9.49	10.82	11.63	8.57	8.34	8.48	6.35	5.92	6.15	Nm	7.06	6.78			
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	6.8	dry	dry	7.2	6.8	6.8	7	6.14	5.7	7.3	7.17	5.89	5.9	5.67	5.52	Nm	5.82	5.94			
ORP	nsl	130	117	105	97	127	97	200	186	179	119	Ns	dry	dry	90	98	87	100	Nm	Nm	Nm	Nm	304	1081.8	662	NA	Nm	165.9	121.1			
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	2.3	1.29	0.4	0.23	2.7	1.48	1.34
Hardness	nsl	100	0	0	100	0	0	0	0	0	0	0	100	100	dry	dry	100	100	100	100	0	100	100	100	100	100	100	100	100	100	100	
Chlorine, Free	< 4	0	0	0	0	0	0	0	0	0	0	0	dry	dry	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	dry	dry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Alkalinity	<300	0	0	0	0	0	0	20	0	0	0	0	dry	dry	40	0	40	40	0	40	40	40	40	40	40	40	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	0.083	0	0.69	0.13	0.19	N/A	0.1			

Station #	Favorable Conditions for Cold Water Fisheries	ST 527 DOWN				Unnamed Stream												PLAN 52 south														
Brook/Stream/Tributary		Unnamed Stream				PLAN 52 south																										
Plan #																																
Direction of Flow		PLAN 52 south																														
Type		PLAN 52 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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct			
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	13.03	12.31	17.41	15.39	Nm	15.36	11.23			
Specific Conductance ( $\mu\text{S}/\text{cm}$ @ 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	371	378	462	409	Nm	364	272			
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	287	286	395	333	Nm	297	200			
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	77.1	37.6	55.4	62.1	Nm	70.2	74.1			
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	8.11	6.98	7.12	6.16	Nm	6.99	6.59			
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	5.86	5.91	5.63	5.48	Nm	6.0	6.0			
ORP	nsl	127	106	105	96	122	81	175	178	173	123	116	dry	dry	80	90	76	60	Nm	Nm	Nm	Nm	1354	357.8	605.3	NA	Nm	161.1	106.9			
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	2.22	2.13	0.78	1.04	2.9	2.19	0.84
Hardness	nsl	100	100	0	100	0	0	0	0	0	100	100	dry	dry	100	100	100	100	0	100	100	100	100	100	100	100	100	100	100			
Chlorine, Free	< 4	0	0	0	0	0	0	0	0	0	0	0	dry	dry	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	dry	dry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Alkalinity	<300	0	0	0	0	0	0	0	0	0	0	0	dry	dry	40	0	40	40	0	40	40	40	40	40	40	40	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	0.063	0.01	0.33	0.14	0.18	NA	0.15			

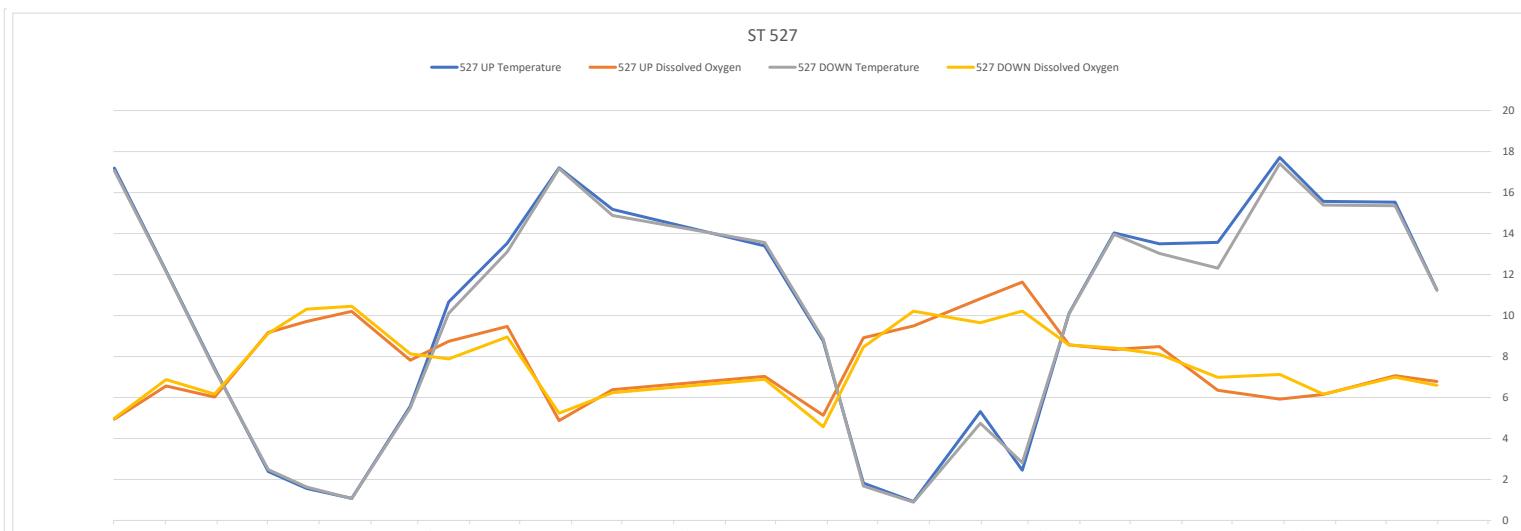


Table 3: Cold Water Fisheries Monitoring Results  
Sudbury to Hudson Reliability Project

Station #	Favorable Conditions for Cold Water Fisheries	ST 540 UP																											
Brook/Stream/Tributary	Dudley Brook	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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct
Plan #	PLAN 54																												
Direction of Flow	south																												
Type	perennial																												
Date	Fisheries	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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct
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	13.81	13.66	21.25	17.06	Nm	16.4	11.16
Specific Conductance ( $\mu\text{S}/\text{cm} @ 25^\circ\text{C}$ )	150-500	340	305	271	312	288	377	573	487	553	663	630	609	890	701	654	599	461	405	436	488	433	406	504	415	Nm	380	329	
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	319	394	468	361	Nm	318	242
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	64	61.5	42.3	55.1	Nm	65	67.8
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	6.62	6.37	3.73	5.32	Nm	6.32	6.24
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	7.2	6.8	7	7.2	6.6	6.9	7.2	6.22	6.1	6.83	6.71	6.28	6.42	5.93	6.02	Nm	6.3	6.53
ORP	nsl	123	101	101	87	106	55	162	176	168	107	94	100	80	135	68	100	173	Nm	Nm	Nm	497	1020.6	993.9	Nm	Nm	140.7	82.1	
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	1.42	3.12	2.37	0.71	2.7	3.26	0.73
Hardness	nsl	100	20	0	100	0	0	100	0	100	100	100	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	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	0	0	0	0	
Alkalinity	<300	40	0	0	0	0	0	0	20	20	40	40	40	40	40	40	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	1.089	0.57	2.9	0.54	0.81	NA	0.73

Station #	Favorable Conditions for Cold Water Fisheries	ST 540 DOWN																											
Brook/Stream/Tributary	Dudley Brook	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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct
Plan #	PLAN 54																												
Direction of Flow	south																												
Type	perennial																												
Date	Fisheries	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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct
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	11.62	13.55	14.34	21.27	16.98	Nm	16.33	11.22
Specific Conductance ( $\mu\text{S}/\text{cm} @ 25^\circ\text{C}$ )	150-500	344	311	274	311	296	376	628	480	555	674	654	591	895	560	558	484	406	446	445	439	393	432	510	407	Nm	377	330	
Specific Conductance ( $\mu\text{s}/\text{cm}$ )	150-500	303	241	184	173	159	199	394	345	429	609	559	556	820	479	395	323	262	238	244	208	327	307	344	474	344	Nm	315	243
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	61.1	63.5	37	47.1	Nm	66.2	62.8
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	6.36	6.48	3.28	4.54	Nm	6.46	6.19
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	6.28	6.32	5.96	6.06	Nm	6.36	6.6
ORP	nsl	115	97	101	85	103	52	137	151	128	125	88	100	78	80	87	120	43	Nm	Nm	Nm	462	1216.7	1033.6	Nm	Nm	138.2	60.1	
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	2.65	3.04	3.26	4.21	2.6	3.22	1.36
Hardness	nsl	100	100	0	0	0	0	0	100	100	100	100	100	100	100	100	100	100	0	0	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	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	0	0	0	0	
Alkalinity	<300	40	40	0	0	20	0	0	20	20	40	40	40	40	40	40	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	1.253	1.06	2.38	0.6	0.73	NA	0.44

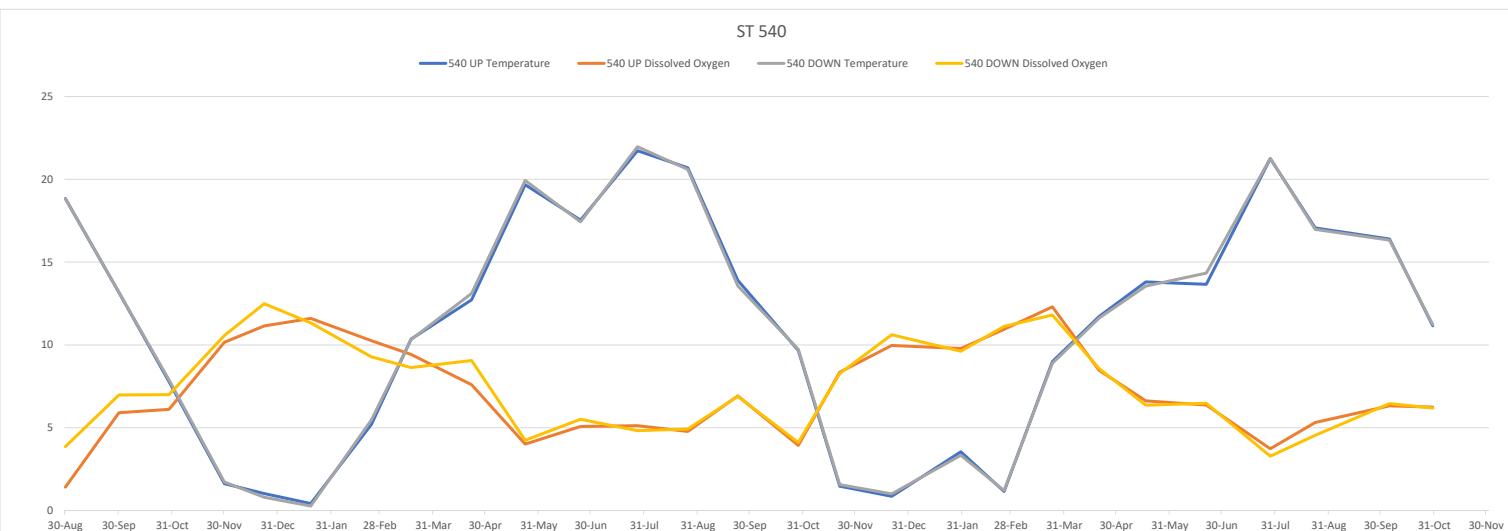


Table 3: Cold Water Fisheries Monitoring Results  
Sudbury to Hudson Reliability Project

Station #	Favorable Conditions for Cold Water Fisheries	ST 561 UP																													
Brook/Stream/Tributary		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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct		
Temperature (°C)	< 20	20.59	14.12	7.57	0.84	0.02	0.22	6.7	12.92	15.79	21	dry	dry	dry	dry	dry	dry	4.1	0.84	9.17	14.2	17.44	14.48	23.73	18.9	Nm	18.27	11.18			
Specific Conductance ( $\mu\text{S}/\text{cm}$ @ 25°C)	150-500	361	344	243	308	244	269	485	439	557	790	dry	dry	dry	dry	dry	dry	408	426	469	479	460	399	426	465	Nm	338	273			
Specific Conductance ( $\mu\text{s}/\text{cm}$ )	150-500	331	272	162	166	127	141	315	337	459	678	dry	dry	dry	dry	dry	dry	245	229	210	380	394	319	415	410	Nm	295	199			
Dissolved Oxygen (%)	nsl	22	42	38	64	71	40	62.4	80.8	91.3	62.5	dry	dry	dry	dry	dry	dry	73.8	75.3	108.2	58.3	61.7	24.5	22.3	46.8	Nm	45.5	64.5			
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	dry	dry	dry	dry	dry	9.63	10.73	11.7	5.98	5.9	2.49	1.86	4.34	Nm	417	6.02			
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	dry	dry	dry	dry	dry	6.43	5.8	6.82	6.92	6.11	5.9	5.86	5.99	Nm	6.23	6.54			
ORP	nsl	47	78	73	72	99	68	147	98	94	89	dry	dry	dry	dry	dry	dry	Nm	Nm	Nm	552	1045.7	870.3	NA	Nm	110.5	-12.6				
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	dry	dry	dry	dry	dry	2.24	0.66	2.19	3.4	7.72	5.3	11.3	13.97	2.9	4.4	0.88
Hardness	nsl	100	100	100	0	0	0	100	100	100	100	dry	dry	dry	dry	dry	dry	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	dry	dry	dry	dry	dry	dry	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	dry	dry	dry	dry	dry	dry	0	0	0	0	0	0	0	0	0	0	0	0		
Alkalinity	<300	40	40	40	0	40	0	40	20	40	40	dry	dry	dry	dry	dry	dry	20	40	40	40	40	40	40	40	40	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	dry	dry	dry	dry	dry	0.478	0.107	0.26	0.04	0.176	0.06	1.38	0.17	0.37	NA	0.37			

Station #	Favorable Conditions for Cold Water Fisheries	ST 561 DOWN																												
Brook/Stream/Tributary		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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct	
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	15.57	Nm	22.3	18.23	Nm	17.74	11.16		
Specific Conductance ( $\mu\text{S}/\text{cm}$ @ 25°C)	150-500	350	338	252	311	245	281	497	431	567	835	dry	dry	dry	dry	dry	dry	424	444	478	474	424	Nm	531	463	Nm	276	252		
Specific Conductance ( $\mu\text{s}/\text{cm}$ )	150-500	318	268	168	168	129	149	324	327	454	750	dry	dry	dry	dry	dry	dry	251	239	213	386	348	Nm	503	403	Nm	238	185		
Dissolved Oxygen (%)	nsl	37	62	62	76	85	44	63.6	74.4	85	67.8	dry	dry	dry	dry	dry	dry	69.5	77.7	110.3	58.1	56.7	Nm	27.4	49.7	Nm	54.2	68.7		
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	dry	dry	dry	dry	dry	9.18	11.03	12.4	5.96	5.64	Nm	2.37	4.67	Nm	5.1	6.31		
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	dry	dry	dry	dry	dry	6.15	5.9	6.92	6.84	5.96	Nm	5.8	5.97	Nm	6.53	6.37		
ORP	nsl	53	70	52	46	79	95	131	116	92.2	48	dry	dry	dry	dry	dry	dry	Nm	Nm	Nm	1041	Nm	320.3	NA	Nm	104.3	46.1			
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	dry	dry	dry	dry	1.04	1.12	2.1	3.5	5.32	Nm	4.3	14.3	2.5	4.54	1.72
Hardness	nsl	100	100	100	100	0	0	0	100	100	100	dry	dry	dry	dry	dry	dry	100	100	100	100	100	100	100	100	100	100	100		
Chlorine, Free	< 4	0	0	0	0	0	0	0	0	0	0	dry	dry	dry	dry	dry	dry	0	0	0	0	0	0	0	0	0	0	0		
Chlorine, Total	< 4	0	0	0	0	0	0	0	0	0	0	dry	dry	dry	dry	dry	dry	0	0	0	0.5	0	0	0	0	0	0	0	0	
Alkalinity	<300	40	40	40	40	0	0	0	20	20	40	dry	dry	dry	dry	dry	dry	20	40	40	40	40	40	40	40	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	dry	dry	dry	dry	dry	0.574	0.081	0.31	0.08	0.102	0.07	0.72	0.13	0.26	NA	0.24		

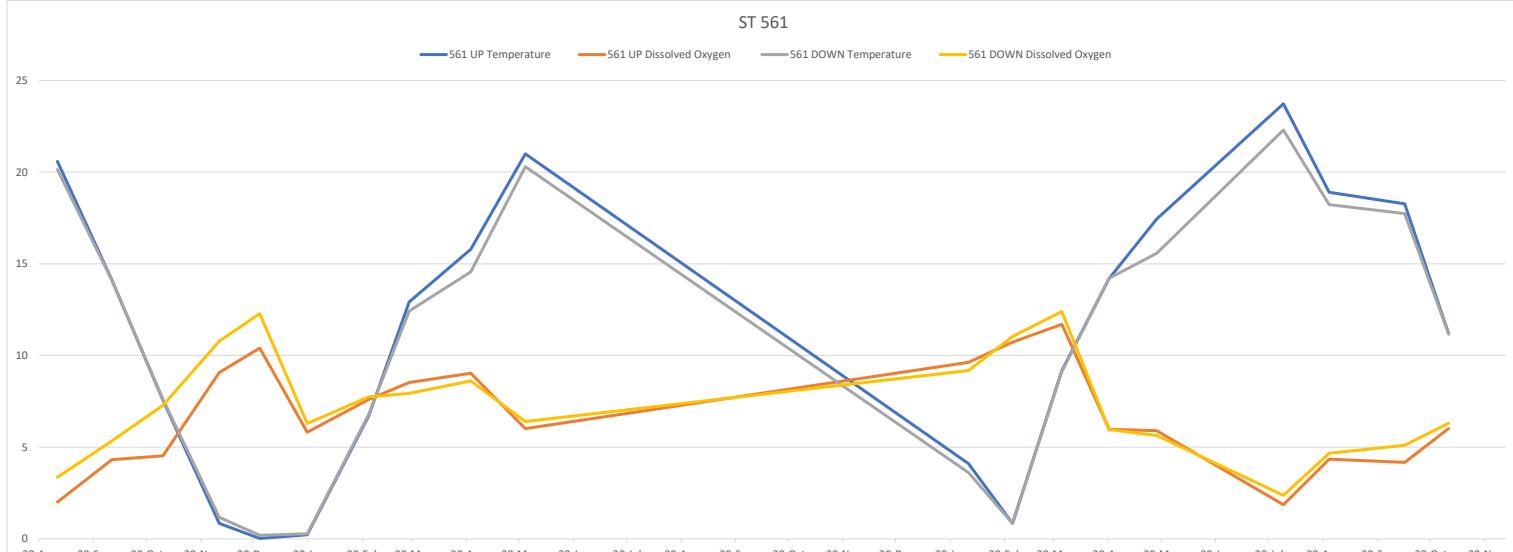


Table 3: Cold Water Fisheries Monitoring Results  
Sudbury to Hudson Reliability Project

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

Station #	Favorable Conditions for Cold Water Fisheries	ST 700 UP																											
Brook/Stream/Tributary	Hop Brook Tributary	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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct
Plan #	PLAN 61	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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct
Direction of Flow	East	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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct
Type	intermittent	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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct
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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct
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	14.23	16.21	23.78	19.52	Nm	18.15	13.72
Specific Conductance ( $\mu\text{S}/\text{cm} @ 25^\circ\text{C}$ )	150-500	1362	1129	1104	1110	1079	1689	2225	3094	2398	10112	dry	dry	dry	946	900	dry	942	1756	3320	1786	1482	1736	1932	1372	1552	Nm	1595	468
Specific Conductance ( $\mu\text{s}/\text{cm}$ )	150-500	1263	938	702	697	1027	1450	2098	1909	9978	dry	dry	dry	728	750	dry	501	1009	1750	1294	1204	1353	1628	1340	1389	Nm	1387	367	
Dissolved Oxygen (%)	nsI	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	82.3	46.3	54.5	26.4	Nm	5.4	68.6
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	9.7	8.43	4.52	4.63	2.41	Nm	0.53	6.23	
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	6.35	6.19	6.03	5.97	Nm	6.52	7.17
ORP	nsI	62	10	20	29	15	70	56.3	55	65	20	dry	dry	dry	105	82	dry	139	Nm	Nm	Nm	82.1	1015	607.4	NA	Nm	-91.3	-138.9	
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	6.71	12.5	16.7	15.3	19.5	12.7	28.7	24.7
Hardness	nsI	100	100	100	250	0	100	250	250	100	250	dry	dry	dry	100	100	dry	100	100	100	100	100	100	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	0	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	0	0	0	0	0	0	
Alkalinity	<300	40	80	40	80	40	40	40	80	40	40	dry	dry	dry	40	40	dry	40	40	40	40	40	80	80	40	40	40		
Velocity (ft/s)	nsI	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	0	0	0.08	0.13	NA	0.11	

Station #	Favorable Conditions for Cold Water Fisheries	ST 710 DOWN																											
Brook/Stream/Tributary	Hop Brook Tributary	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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct
Plan #	PLAN 63	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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct
Direction of Flow	East	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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct
Type	intermittent	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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct
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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct
Temperature (°C)	< 20	21.08	14.28	9.55	0.40	0.01	frozen	8.55	11.06	15.44	24	dry	dry	dry	13.94	11.35	dry	0.03	2.68	1.67	10.8	14.34	14.05	16.17	24.05	18.67	Nm	18.22	12.75
Specific Conductance ( $\mu\text{S}/\text{cm} @ 25^\circ\text{C}$ )	150-500	1122	755	927	1054	1108	frozen	2215	3268	2228	10068	dry	dry	dry	878	1260	dry	955	1731	3000	1734	1466	1669	1870	1290	1469	Nm	1648	490
Specific Conductance ( $\mu\text{s}/\text{cm}$ )	150-500	1039	600	653	559	580	frozen	1520	2409	1822	9630	dry	dry	dry	677	867	dry	495	992	1680	1265	1169	1322	1553	1267	1291	Nm	1435	375
Dissolved Oxygen (%)	nsI	37	49	61	59	73	frozen	54.8	57.4	82.5	46.8	dry	dry	dry	53.5	24.3	dry	52.3	65.5	75	95.1	122.9	81.9	45.2	57.3	31	Nm	46.8	65.5
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	dry	5.61	2.8	dry	7.66	8.83	10.35	10.46	12.55	8.38	4.42	4.8	2.88	Nm	4.36	6.02
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	dry	7.54	6.76	dry	7.8	6.9	6.0	6.52	6.7	6.41	6.18	6.08	6.15	Nm	6.7	6.75
ORP	nsI	66	51	25	72	60	frozen	92.4	98	79	10	dry	dry	dry	110	72.7	dry	410	Nm	Nm	Nm	80.1	989	603.9	NA	Nm	-2.1	-24.3	
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	dry	3.65	4.58	dry	6.42	7.47	5.69	5.1	5.06	7.2	14.2	13.6	15.6	10.3	16.1	18.53
Hardness	nsI	100	120	100	100	0	frozen	100	250	100	100	dry	dry	dry	100	100	dry	100	100	100	100	100	100	100	100	100	100	100	
Chlorine, Free	< 4	0	0	0	0	0	frozen	0	0	0	0	dry	dry	dry	0	0	dry	0	0	0	0	0	0	0	0	0	0	0	
Chlorine, Total	< 4	0	0	0	0	0	frozen	0	0	0	0	dry	dry	dry	0	0	dry	0	0	0	0	0.5	0	0	0	0	0		
Alkalinity	<300	100	100	40	40	20	frozen	40	40	40	40	dry	dry	dry	40	40	dry	40	40	40	40	40	40	80	80	40	40	40	
Velocity (ft/s)	nsI	0.08	0.02	0.07	0.02	Na	frozen	0.18	0.2	0.02	0.08	dry	dry	dry	0.06	0.04	dry	0.06	0.05	0.145	0.13	0.06	0.023	0	0.76	0.1	0.11	NA	0.13

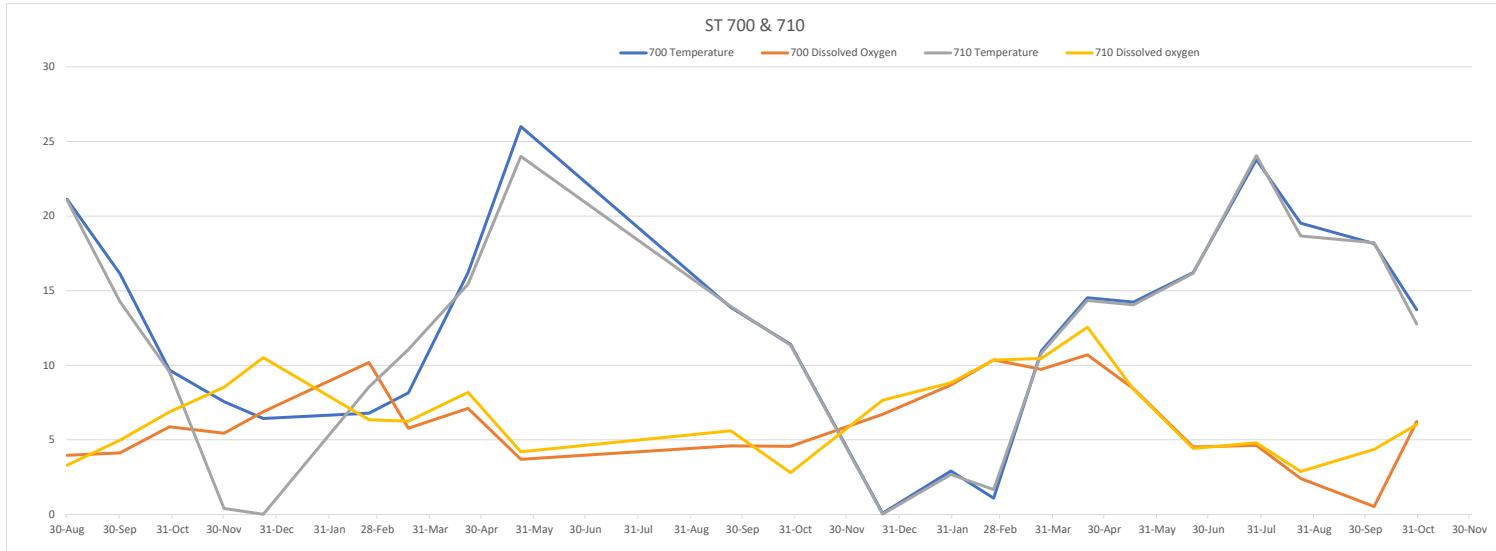


Table 3: Cold Water Fisheries Monitoring Results  
Sudbury to Hudson Reliability Project

Station #	Favorable Conditions for Cold Water Fisheries	ST 725 UP																														
Brook/Stream/Tributary	PLAN 65 south perennial	Hop Brook																														
Plan #																																
Direction of Flow																																
Type																																
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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct			
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	15.16	16.52	22.46	17.91	Nm	17.18	11.69			
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	473	594	634	455	Nm	477	404			
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	384	493	593	393	Nm	406	314			
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	74.7	64.2	53.8	58.7	Nm	85.6	79.3			
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	7.5	6.27	4.69	5.55	Nm	8.26	7.87			
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	6.65	6.71	6.63	6.11	Nm	6.9	6.91				
ORP	nsl	97	96	88	81	94	35	88.5	121	116	91	Ns	134	100	140	127	Nm	215	Nm	Nm	352.3	1023.4	954.6	NA	Nm	118.7	107.8					
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	12.4	5.32	2.46	2.67	3.4	3.25	4.22			
Hardness	nsl	40	0	0	100	0	0	0	100	100	100	100	100	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	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	0	0	0	0	0	0		
Alkalinity	<300	100	0	0	40	0	0	0	20	40	40	40	40	40	40	40	40	40	0	40	40	40	40	40	40	40	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	0.126	0.06	0.36	0.31	0.45	NA	0.29			

Station #	Favorable Conditions for Cold Water Fisheries	ST 725 DOWN																														
Brook/Stream/Tributary	PLAN 65 south perennial	Hop Brook																														
Plan #																																
Direction of Flow																																
Type																																
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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct			
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	15.05	16.41	22.37	17.87	Nm	17.17	11.68			
Specific Conductance (µS/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	469	586	623	460	Nm	477	406			
Specific Conductance (µS/cm)	150-500	365	287	253	176	190	255	479	455	543	788	673	760	733	541	467	398	283	388	325	343	425	380	490	591	397	Nm	406	302			
Dissolved Oxygen (%)	nsl	80	79	100	102	101	106	74	81.5	93	87	62.4	65.1	70.6	75.6	83.6	88.1	89.1	87.3	86.1	82.2	74.8	64.4	53.8	61.7	Nm	87.2	83.5				
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	5.77	7.22	8.47	11.78	12.79	12.17	11.96	9.96	9.27	7.53	6.29	4.66	5.85	Nm	8.39	8.14				
pH	6.5-8.3	7.2	7.0	7.1	7.2	7.3	7.1	7.6	7.78	7.98	6.8	7.61	7.25	6.8	6.8	7	7.07	6.5	6.94	6.68	6.56	6.64	6.53	6.14	Nm	7.05	6.98					
ORP	nsl	98	98	80	76	92	29	128	124	122.2	89	Ns	140.3	110	120	120	Nm	51	Nm	Nm	345	932	939.7	NA	Nm	119.7	119.3					
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	3.17	4.41	2.41	2.71	3.2	5.73	3.64			
Hardness	nsl	40	0	0	100	0	0	100	100	100	100	100	100	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	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	0	0	0	0	0	0		
Alkalinity	< 300	100	0	0	0	0	0	20	40	40	40	40	40	40	40	40	40	0	40	40	40	40	40	40	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	0.132	0.11	0.64	0.29	0.33	NA	0.12			

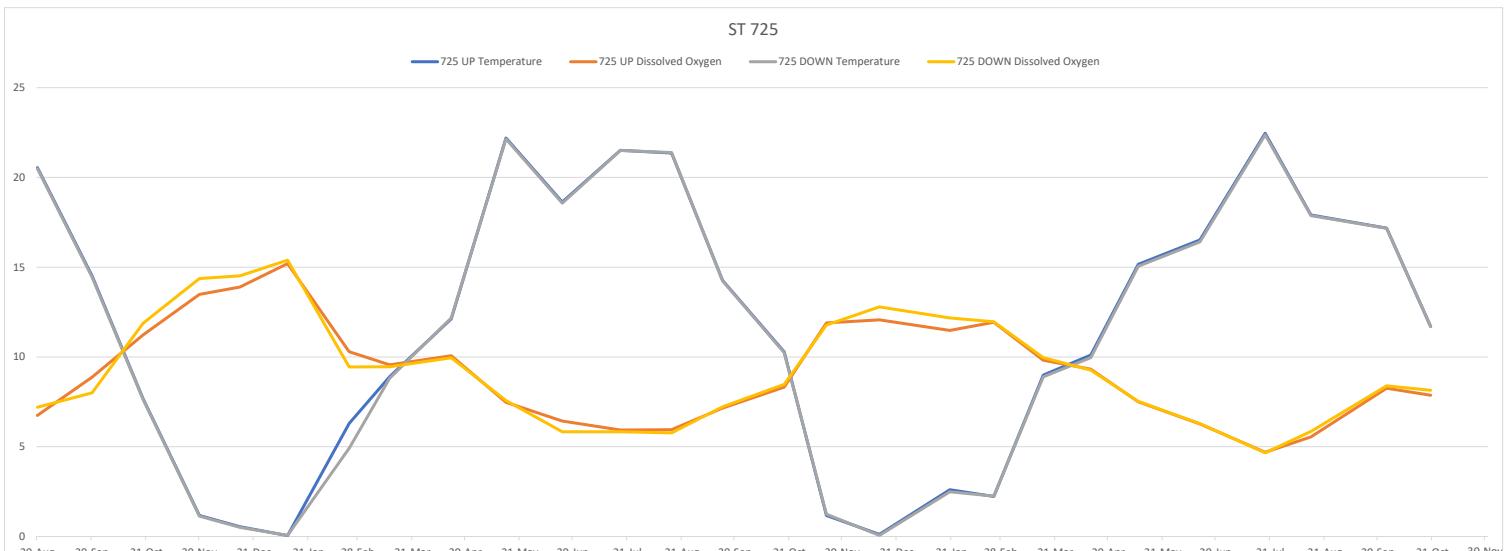


Table 3: Cold Water Fisheries Monitoring Results  
Sudbury to Hudson Reliability Project

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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct	
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	9.6	dry	0.6	3.62	2.18	9.11	11.03	12.71	14.57	20.52	15.56	Nm	15.94	11.78		
Specific Conductance ( $\mu\text{S}/\text{cm} @ 25^\circ\text{C}$ )	150-500	524	418	379	451	377	530	774	626	798	826	832	dry	dry	dry	627	dry	509	595	620	508	661	501	578	597	637	Nm	555	401	
Specific Conductance ( $\mu\text{S}/\text{cm}$ )	150-500	468	325	254	252	200	286	473	432	612	730	689	dry	dry	dry	451	dry	272	352	351	354	485	383	463	544	66.4	Nm	459	300	
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	75.8	65.7	63.5	66.4	Nm	87.2	71.5	
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	8.02	6.67	5.71	6.61	Nm	8.61	7.89	
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	6.58	6.7	6.21	6.28	Nm	7.48	6.76	
ORP	nsl	58	60	80	59	76	-15	124	98	92	101	Ns	dry	dry	dry	102	dry	340	Nm	Nm	345	310.7	557.8	NA	Nm	90.7	144.1			
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	2.42	dry	dry	dry	1.67	dry	0.29	1.48	0.96	2.35	2.45	2.62	6.92	1.72	0.29	2.8	3.68	5.66	
Hardness	nsl	80	40	40	100	0	0	100	100	100	100	100	dry	dry	dry	100	dry	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	dry	dry	dry	0	dry	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	dry	dry	dry	0	dry	0	0	0	0	0	0	0	0	0	0	0	0	0
Alkalinity	<300	100	100	100	40	20	40	40	40	40	40	40	dry	dry	dry	40	dry	40	40	40	40	40	40	40	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	0.64	0.63	1.34	0.15	0.18	NA	0.28	

Station #	Favorable Conditions for Cold Water Fisheries	ST 747 DOWN																												
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	17-May	21-Jun	28-Jul	23-Aug	28-Sep	5-Oct	30-Oct	
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	12.55	14.43	20.42	15.33	Nm	15.88	11.71	
Specific Conductance ( $\mu\text{S}/\text{cm} @ 25^\circ\text{C}$ )	150-500	495	451	382	453	403	532	803	643	795	875	836	dry	dry	dry	647	dry	532	575	617	561	668	474	583	634	662	Nm	560	410	
Specific Conductance ( $\mu\text{S}/\text{cm}$ )	150-500	443	350	256	252	213	285	516	441	614	775	683	dry	dry	dry	460	dry	283	342	348	388	488	362	466	578	540	Nm	462	305	
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	84.4	69	61.4	65	Nm	86.5	72.6	
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	9.07	7.02	5.53	6.49	Nm	8.55	8.44	
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	7.33	8.76	6.11	6.99	Nm	7.27	6.77	
ORP	nsl	73	75	84	57	82	21	25.5	106	94	91.1	Ns	dry	dry	dry	100	dry	368	Nm	Nm	Nm	351	436.6	1111.7	NA	Nm	99.6	209.2		
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	2.27	8.76	1.78	3.13	2.7	5.27	2.07	
Hardness	nsl	80	40	40	100	0	0	0	100	100	100	100	dry	dry	dry	100	dry	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	dry	dry	dry	0	dry	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	dry	dry	dry	0	dry	0	0	0	0	0	0	0	0	0	0	0	0	0
Alkalinity	<300	100	100	100	40	40	0	40	40	40	40	40	dry	dry	dry	40	dry	40	40	40	40	40	40	40	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	0.15	0.32	0.55	0.06	0.12	NA	0.13	

