

## Emerald Creek Phase 3 – Headwater Drainage Features Assessment

FINAL REPORT

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Introduction

### 1.0 INTRODUCTION

Stantec Consulting Ltd. (Stantec) was retained by 8298025 Canada Inc. (the Client) to support their proposed development of the Emerald Creek Phase 3 subdivision (the Project; concept provided in **Appendix A**). Stantec's Environmental Services group (BC1609) was retained to complete a headwater drainage features assessment (HDFA) at 481 Tullamore Street, Ottawa, Ontario (the Site; 18T 452380E, 5013237N) (**Figure 1, Appendix B**) to evaluate and classify the unnamed tributaries to the Spratt Drain municipal drain (headwater drainage features) and to identify appropriate management recommendations for each section of the features anticipated to be impacted by the Project.

Due to historical land use (e.g., agriculture) as well as recent and on-going development observed within the general area (e.g., residential), the headwater drainage features within the Site have been channelized and were observed to be mapped differently by various agencies (**Figure 1, Appendix B**). Vegetation removal within the Site, associated with previous development activities, was observed to occur approximately 10 years prior using historical aerial imagery.



Regulatory Policy Context

## 2.0 REGULATORY POLICY CONTEXT

The Conservation Authorities Act is the enabling legislation that provides the legal basis for the creation of conservation authorities ("CAs") in Ontario. Generally, the Conservation Authorities Act directs CAs to perform a number of critical functions regarding watershed planning and management including the prevention, elimination, or reduction of loss of life and property from flood hazards and erosion hazards, as well as the conservation and restoration of natural resources.

Section 25 of the *Conservation Authorities Act* defines a watercourse as "an identifiable depression in the ground in which a flow of water regularly or continuously occurs". Section 28 of the *Conservation Authorities Act* empowers CAs to make regulations in the area under its jurisdiction, including the prohibition, regulation or permitting for development if the control of flooding, erosion, or the conservation of land may be affected by the development.

Pursuant to *Ontario Regulation 174/06, Development, Interference with Wetlands and Alterations to Shorelines and Watercourses,* prior permission is required from the Rideau Valley Conservation Authority (RVCA) for development within a floodplain, valleylands, wetland, or other hazardous land. Permission is also required from the RVCA for alteration to a river, creek, stream or watercourse or interference with the hydrological function of a wetland.

Through correspondence with the RVCA (Jennifer Lamoureux, Aquatic and Fish Habitat Biologist) on April 19, 2021, it was indicated to Stantec that a Standard Level Assessment was required to assess the headwater drainage features on, and immediately adjacent to, the Site. RVCA indicated that the following components related to a HDFA are required to support proposed physical and/or hydrological modifications to any headwater drainage features on, and immediately adjacent to, the Site:

- Applications to alter headwater drainage features shall be assessed in accordance with the document titled "Evaluation, Classification and Management of Headwater Drainage Features Guideline." (TRCA and CVC 2014)
- Applicants shall pre-consult with the Conservation Authority to ensure that the scope and timing of the HDFA is appropriate for the scale/type of the proposal, availability of information for the feature and the sensitivity of the feature.
- The evaluation of a headwater drainage feature shall include collecting information that may be available in a watershed or subwatershed plan, catchment reports, an environmental management plan, fisheries management plan etc.



Methods

# 3.0 METHODS

#### 3.1 BACKGROUND DATA COLLECTION

As part of this HDFA at the proposed EOCC, existing conditions and potential natural heritage features (e.g., species at risk (SAR)) within the Study Area were initially identified by reviewing the following available background documents and related information sources:

- Ontario's Natural Heritage Information Centre (NHIC) Make a Natural Heritage Area Map (NDMNRF 2021a)
- Land Information Ontario (LIO) (NDMNRF 2021b)
- Ministry of Agriculture, Food and Rural Affairs (OMAFRA) AgMaps Geographic Information Portal (OMAFRA 2020)
- Rideau Valley Conservation Authority (RVCA) GeoPortal (RVCA 2021)
- RVCA's Lower Rideau River Subwatershed Report 2012: Mosquito Creek Catchment (RVCA 2012)
- RVCA's City Stream Watch: Mosquito Creek 2015 Summary Report (RVCA 2015)
- City of Ottawa Official Plan (2013; including all consolidations)
- Fisheries and Oceans Canada (DFO) Aquatic Species at Risk Mapping (DFO 2021)
- Satellite imagery (Google Earth Pro 2021)

#### 3.2 FIELD DATA COLLECTION

Collection methods in this HDFA followed the guidance provided in the Toronto Region Conservation Authority and the Credit Valley Conservation's *Evaluation, Classification and Management of Headwaters Drainage Features Guidelines* (the Guidelines) (TRCA and CVC 2014). These guidelines use standardized survey methods and a tiered study design to determine the risk of functional impairment to a headwater drainage feature through land development.

As outlined in the Guidelines, this HDFA was completed using the following steps:

- 1. **Evaluation** (consultation with the RVCA, collect background data, collect field data)
- 2. **Classification** (classify the functions of each headwater drainage feature with respect to hydrology, riparian vegetation, fish and fish habitat and terrestrial habitat)
- 3. **Management Recommendations** (provide management options recommendations for headwater drainage features based on the classification of each)

Standard field data collection for this HDFA followed the field procedures outlined in the Ontario Stream Assessment Protocol's module *Assessing Headwater Drainage Features, Section 4, Module 10* (S4:M10) (Stanfield 2013). Spate conditions were observed within the headwater drainage features during the initial assessment (#1) in early May. The headwater drainage features were observed to exhibit base flow conditions during the subsequent assessments (#2 and #3) in May and July, respectively.



Methods

See **Table 3.1** for survey dates and environmental conditions observed during Stantec's HDFA within the Study Area.

Table 3.1 Dates and Environmental Conditions of Stantec's HDFA within the Study Area

Purpose of Investigation	Date	Start/End Time (24 hour)	Weather Conditions	Biologist
<ul> <li>Headwater Drainage Feature         Assessment #1</li> <li>General/SWH/SAR Wildlife         Habitat Assessment</li> <li>Fish and Fish Habitat Assessment</li> </ul>	May 6, 2021	1000 – 1400	Temperature: 8 – 10°C Wind (Beaufort scale): 0 Cloud Cover: 30% Precipitation: None 24/hr. Precipitation: None	Josh Mansell & Brennan Obermayer
Headwater Drainage Feature     Assessment #2     General/SWH/SAR Wildlife     Habitat Assessment	May 27, 2021	0930 – 1330	Temperature: 8 – 13°C Wind (Beaufort scale): 1 Cloud Cover: 0% Precipitation: None 24/hr. Precipitation: None	Josh Mansell
Headwater Drainage Feature     Assessment #2     General/SWH/SAR Wildlife     Habitat Assessment	July 30, 2021	0800 – 1230	Temperature: 14 – 18°C Wind (Beaufort scale): 1 Cloud Cover: 50% Precipitation: None 24/hr. Precipitation: None	Josh Mansell

As recorded at the Ottawa International Airport, approximately five kilometres (km) north of the Study Area, the following monthly rainfall amounts overlapping with the headwater drainage feature assessments were observed (ECCC 2021):

- April 2021 59.2 mm
- June 2021 99.1 mm
- July 2021 104.1 mm



Headwater Drainage Feature Assessment

## 4.0 HEADWATER DRAINAGE FEATURE ASSESSMENT

#### 4.1 BACKGROUND DATA COLLECTION

The headwater drainage features on, and immediately adjacent to, the Site were all observed to be either wetland features, engineered swales and historically channelized features. There are no specific fisheries data available for the headwater drainage features, however, the Site is located within the Mosquito Creek subwatershed in the Lower Rideau watershed, as identified in the City of Ottawa's Official Plan (2013). As such, the RVCA's Lower Rideau River Subwatershed Report 2012: Mosquito Creek Catchment (RVCA 2012) and City Stream Watch: Mosquito Creek 2015 Summary Report (RVCA 2015) were used to collect data and both resources have identified the thermal regime of Mosquito Creek as ranging between cool- and warmwater.

The Ministry of Agriculture, Food and Rural Affairs (OMAFRA) AgMaps (2020) identifies the Spratt Drain municipal drain, immediately downstream of the Site, as a DFO Class C drain which typically support a non-sensitive, spring spawning fish community. Additionally, the Ministry of Northern Development, Mines, Natural Resources and Forestry's (NDMNRF) Kemptville District indirectly identifies the Spratt Drain municipal drain as having a restricted in-water activity window from March 15 to June 30 in any given year to protect spring spawning (warmwater) species (NDMNRF 2013).

DFO's Aquatic Species at Risk Mapping (2021) does not identify the headwater drainage features on, and immediately adjacent to, the Site, Spratt Drain municipal drain or Mosquito Creek as Critical Habitat or as potential habitat for aquatic species protected under the SARA.

#### 4.2 EVALUATION

Data collected during the HDFA are used to classify the features proposed to be impacted by the Project and provide appropriate management recommendations. The assessment evaluates the contribution of sediment, nutrients and flow to downstream reaches, as well as the use of these features by fish and wildlife; specifically, SAR.

The Guidelines define headwater drainage features as "non-permanently flowing drainage features that may not have defined bed or banks; they are first-order and zero-order intermittent and ephemeral channels, swales and connected headwater wetlands, but do not include rills or furrows". Through correspondence with the RVCA and review of background data, Stantec confirmed the presence of the headwater drainage features on, and immediately adjacent to, the Site and then applied the Strahler method (Strahler 1957) to determine stream order of the headwater drainage feature.

The 3.23-hectare Site, which is bisected by a proposed extension of Tullamore Street, has been predominantly cleared of woody vegetation which has been graded and levelled with fill. Areas that have been recently filled and graded are dominated by pioneer meadow species including wild carrot (*Daucus carota*) and white sweet-clover (*Melilotus albus*) (**Photos 1 – 6, Appendix C**). There is a small area (~500 m²) in the northeast corner of the Site that was not filled and graded which is dominated by wetland



Headwater Drainage Feature Assessment

vegetation, predominantly *Carex* spp. and broad-leaved cattail (*Typha latifolia*) (**Photos 41 – 44**, **Appendix C**). An approximate 30 m strip of deciduous forest remains along both the northern and southern boundaries of the Site adjacent to the mapped headwater drainage features.

As shown on NHIC (NDMNRF 2021a) and LIO (NDMNRF 2021b), an unevaluated wetland pocket is shown as occurring along the whole eastern boundary of the Site and is shown as being associated with woodlands. The web-based geoOttawa Unevaluated Wetlands 2011 layers shows a larger contiguous unevaluated wetland polygon in the northern section of the Site, which also encompasses the NHIC and LIO mapped wetland.

Based on the Guidelines definition of a headwater drainage feature, a total of two headwater drainage features, separated into eleven distinct reaches, were observed within, or immediately adjacent to, the Site (**Figure 2**, **Appendix A**).

Fish community sampling within the two headwater drainage features did not occur as part of Stantec's HDFA as low water conditions were observed during the late May and July assessment periods. Fish were not observed within any of the headwater drainage features assessed by Stantec as part of this HDFA.

### 4.3 CLASSIFICATION

During Stantec's 2021 HDFA, reaches were delineated within each headwater drainage feature observed within the Site that are anticipated to be impacted by the Project. The classification of each reach was assessed by collecting data on the following parameters, as defined by the Guidelines:

- 1. Hydrology
- 2. Riparian
- 3. Fish and Fish Habitat
- 4. Terrestrial Habitat

The classification of fish and fish habitat was accomplished by completing a fish and fish habitat assessment on May 6, 2021. Existing conditions and parameter classifications of each reach is summarized below in **Table 4.1**. Photographic records of each reach within each headwater drainage feature are provided in **Appendix C** and HDFA field notes are provided in **Appendix D**.



Table 4.1 Headwater Drainage Features Characteristics and Classifications within the Site

Reach				Featur	е Туре			Char Dimen			y May 2 ydrolog			e May 2 ydrolog			uly 202 ydrolo				Riparia	an Veg	etatior	l			errestr Habita			Fish I	Habitat		
Headwater Drainage Feature Reach	Length Assessed (m)	Defined Natural Channel	Channelized	No Defined Feature	Swale	Tiled Drainage	Wetland	Feature Width (m)	Bankfull Depth (m)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	None	Lawn	Cropped Land	Meadow	Scrubland	Forest	Wetland	Breeding Amphib. Wetlands	General Amphib. Habitat	Movement Corridors	No Habitat	Year Round	Seasonal	Contributing	Headwater Drainage Feature Description
ECk3- HDF1- R1-S1	82	_	•	_				2.0	3.0	Y	16	Y	N	n/a	N	N	n/a	N		_	_	<b>✓</b>	•	ı		I		*	l			*	This channelized section is located south of the proposed Tullamore Street extension and flows south. It is not connected to ECk3-HDF1-R1-S2 via a culvert under Tullamore Street and is currently receiving flows from the existing roadside ditch south of Tullamore Street and ECk3-HDF1-R2-S1 during periods of high precipitation. The feature was observed to provide seasonal hydrology to downstream areas and may provide seasonal fish habitat, provided barriers to fish are not present further downstream. This section of the HDF is mapped by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021) and OMAFRA (2020) and is also shown as a Ditch by geoOttawa (2020) (Photos 7 – 11, Appendix C).



Table 4.1 Headwater Drainage Features Characteristics and Classifications within the Site

Reach				Featur	е Туре			Chan Dimens			y May 2 ydrolog			e May 2 ydrolog			uly 202 /drolog				Riparia	ın Veg	etation	l			errestri Habita			Fish I	Habitat		
Headwater Drainage Feature Reach	Length Assessed (m)	Defined Natural Channel	Channelized	No Defined Feature	Swale	Tiled Drainage	Wetland	Feature Width (m)	Bankfull Depth (m)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	None	Lawn	Cropped Land	Meadow	Scrubland	Forest	Wetland	Breeding Amphib. Wetlands	General Amphib. Habitat	Movement Corridors	No Habitat	Year Round	Seasonal	Contributing	Headwater Drainage Feature Description
ECk3- HDF1- R1-S2	75						<b>✓</b>	14	n/a	Y	20	N	N	n/a	N	N	n/a	N	<b>✓</b>	_		•		*		<b>✓</b>			✓				This isolated, wetland section is located north of the proposed Tullamore Street extension and flows south. The feature is located within the limits of the geoOttawa (2020) mapped unevaluated wetland. It is not connected to ECk3-HDF1-R1-S1 via a culvert under Tullamore Street and is currently receiving flows from ECk3-HDF1-R1-S3 and the unevaluated wetland north of the feature. This feature does not have a defined channel and was observed to be hydrologically connected to the unevaluated wetland, therefore, the amount of water in the feature is directly related to the seasonal water level of the wetland. The feature is not considered to provide fish habitat. This section of the HDF is mapped by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021) and OMAFRA (2020) but is not shown by geoOttawa (2020) (Photos 12 – 17, 19, 22 Appendix C).



Table 4.1 Headwater Drainage Features Characteristics and Classifications within the Site

Reach				Featur	е Туре	ı		Chan Dimens		Early Hy	y May 2 ydrolog	<b>2021</b> gy		May 20 ydrolog			uly 202 /drolog				Riparia	ın Veg	etation	l			errestri Habitat			Fish	Habitat		
Headwater Drainage Feature Reach	Length Assessed (m)	Defined Natural Channel	Channelized	No Defined Feature	Swale	Tiled Drainage	Wetland	Feature Width (m)	Bankfull Depth (m)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	None	Lawn	Cropped Land	Meadow	Scrubland	Forest	Wetland	Breeding Amphib. Wetlands	General Amphib. Habitat	Movement Corridors	No Habitat	Year Round	Seasonal	Contributing	Headwater Drainage Feature Description
ECk3- HDF1- R1-S3	50						*	n/a	n/a	Y	10	Z	N	n/a	N	N	n/a	Z						*	*	*	_		✓				This isolated, wetland section is located along the northern boundary of the Site and contributes to flows in ECk3-HDF1-R1-S2. The feature is located within the limits of the geoOttawa (2020) mapped unevaluated wetland. This feature does not have a defined channel and was observed to be hydrologically connected to the unevaluated wetland, therefore, the amount of water in the feature is directly related to the seasonal water level of the wetland. The feature is not considered to provide fish habitat. This section of the HDF is mapped by geoOttawa (2020) as a Watercourse and is not shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021) and OMAFRA (2020). geoOttawa (2020) shows this feature as connecting directly with ECk3-HDF2-R1-S2, however, this connection was not observed by Stantec during this HDFA (Photos 17 – 23, Appendix C).



Table 4.1 Headwater Drainage Features Characteristics and Classifications within the Site

Reach				Featur	е Туре			Chan Dimens			y May 2 ydrolog			e May 2 ydrolog			uly 202 ydrolog				Riparia	an Veg	etatior	1		-	errestri Habitat			Fish I	Habitat		
Headwater Drainage Feature	Length Assessed (m)	Defined Natural Channel	Channelized	No Defined Feature	Swale	Tiled Drainage	Wetland	Feature Width (m)	Bankfull Depth (m)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	None	Lawn	Cropped Land	Meadow	Scrubland	Forest	Wetland	Breeding Amphib. Wetlands	General Amphib. Habitat	Movement Corridors	No Habitat	Year Round	Seasonal	Contributing	Headwater Drainage Feature Description
ECk3 HDF1 R2-S1	- 215	-	*	-				1.0	0.1	Y	90	Y	N	n/a	N	N	n/a	N	-	-	-	*	<b>*</b>	-	-	-	-	*		-		*	This channelized feature observed along the southern boundary of the Site provides flows from the western area of the Site into ECk3-HDF1-R1-S1. The feature was observed to provide seasonal hydrology to downstream areas and may provide seasonal fish habitat, provided barriers to fish are not present further downstream. This section of the HDF is not shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021) or OMAFRA (2020) and is shown as a Ditch in geoOttawa (2020) (Photos 24 – 27, Appendix C).

Table 4.1 Headwater Drainage Features Characteristics and Classifications within the Site

Reach				Featur	е Туре	ļ		Char Dimen			y May :			e May 2 ydrolog			uly 202 ydrolog				Riparia	ın Veg	etation	1			errestr Habita			Fish	Habitat	:	
Headwater Drainage Feature Reach	Length Assessed (m)	Defined Natural Channel	Channelized	No Defined Feature	Swale	Tiled Drainage	Wetland	Feature Width (m)	Bankfull Depth (m)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	None	Lawn	Cropped Land	Meadow	Scrubland	Forest	Wetland	Breeding Amphib. Wetlands	General Amphib. Habitat	Movement Corridors	No Habitat	Year Round	Seasonal	Contributing	Headwater Drainage Feature Description
ECk3- HDF2- R1-S1	0	_	•	_				n/a	n/a	Y	n/a	Y	N	n/a	N	N	n/a	N			_		_	•	•			*		_		•	This channelized feature, located west of the Site, was observed to receive all flows from all four reaches within ECk3-HDF2 and is shown by geoOttawa (2020) as a Ditch and Watercourse that directs flows into the Spratt Drain municipal drain ~650 m west of the Site. The feature was observed to provide seasonal hydrology to downstream areas and may provide seasonal fish habitat, provided barriers to fish are not present further downstream. This section of the HDF is not shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021) or OMAFRA (2020). Access to this feature was not provided and was observed from the Site boundary only. As such, no data sheets for this section are provided (Photo 28, Appendix C).

Table 4.1 Headwater Drainage Features Characteristics and Classifications within the Site

Reach				Featur	е Туре			Chan Dimens			y May 2 ydrolog			e May 20 ydrolog			uly 202 /drolog				Riparia	ın Veg	etation				errestri Habitat			Fish I	Habitat		
Headwater Drainage Feature Reach	Length Assessed (m)	Defined Natural Channel	Channelized	No Defined Feature	Swale	Tiled Drainage	Wetland	Feature Width (m)	Bankfull Depth (m)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	None	Lawn	Cropped Land	Meadow	Scrubland	Forest	Wetland	Breeding Amphib. Wetlands	General Amphib. Habitat	Movement Corridors	No Habitat	Year Round	Seasonal	Contributing	Headwater Drainage Feature Description
ECk3- HDF2- R1-S2	100		•					1.25	0.2	Y	90	Y	N	n/a	N	N	n/a	N		_				<b>✓</b>	*			<b>✓</b>		-		<b>✓</b>	This small, channelized feature, shown as a Ditch and Watercourse by geoOttawa (2020), is located within the boundary of the unevaluated wetlands shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021), OMAFRA (2020) and geoOttawa (2020) and is directly connected to ECk3- HDF2-R1-S1. The feature was observed to provide seasonal hydrology to downstream areas and may provide seasonal fish habitat, provided barriers to fish are not present further downstream. This section of the HDF is not shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021) or OMAFRA (2020). geoOttawa (2020) shows this feature as connecting directly with ECk3-HDF1-R1-S3, however, this connection was not observed by Stantec during this HDFA (Photos 30 – 31, Appendix C).



Table 4.1 Headwater Drainage Features Characteristics and Classifications within the Site

Reach				Featur	е Туре			Char Dimen			y May 2 ydrolog			e May 2 ydrolog			uly 202 /drolog				Riparia	n Veg	etation	l			errestri Habita			Fish I	Habitat		
Headwater Drainage Feature Reach	Length Assessed (m)	Defined Natural Channel	Channelized	No Defined Feature	Swale	Tiled Drainage	Wetland	Feature Width (m)	Bankfull Depth (m)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	None	Lawn	Cropped Land	Meadow	Scrubland	Forest	Wetland	Breeding Amphib. Wetlands	General Amphib. Habitat	Movement Corridors	No Habitat	Year Round	Seasonal	Contributing	Headwater Drainage Feature Description
ECk3- HDF2- R2-S1	0		•	_				n/a	n/a	Y	n/a	Y	N	n/a	N	N	n/a	N		_				*	•			*		_		•	This medium, channelized feature, shown as a Ditch by geoOttawa (2020), is located within the boundary of the unevaluated wetlands shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021), OMAFRA (2020) and geoOttawa (2020) and flows into ECk3- HDF2-R1-S1. The feature was observed to provide seasonal hydrology to downstream areas and may provide seasonal fish habitat, provided barriers to fish are not present further downstream. This section of the HDF is not shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021) or OMAFRA (2020). Access to this feature was not provided and was observed from the Site boundary only. As such, no data sheets for this section are provided (Photo 28, Appendix C).



Table 4.1 Headwater Drainage Features Characteristics and Classifications within the Site

Reach				Featur	е Туре			Chan Dimens			y May 2 ydrolog			e May 2 ydrolog			uly 202 ydrolog				Riparia	an Veg	etation	l			errestri Habita			Fish	Habitat		
Headwater Drainage Feature Reach	Length Assessed (m)	Defined Natural Channel	Channelized	No Defined Feature	Swale	Tiled Drainage	Wetland	Feature Width (m)	Bankfull Depth (m)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	None	Lawn	Cropped Land	Meadow	Scrubland	Forest	Wetland	Breeding Amphib. Wetlands	General Amphib. Habitat	Movement Corridors	No Habitat	Year Round	Seasonal	Contributing	Headwater Drainage Feature Description
ECk3- HDF2- R3-S1	100	1	*	_	ı	ı		1.25	0.2	Y	90	<b>&gt;</b>	N	n/a	N	Z	n/a	Z	ı	ı	ı	ı	_	•	<b>&gt;</b>		ı	*	ı	_		*	This small, channelized feature, shown as a Ditch and Watercourse by geoOttawa (2020), is located within the boundary of the unevaluated wetlands shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021), OMAFRA (2020) and geoOttawa (2020) and flows into ECk3- HDF2-R3-S1. This feature runs parallel to ECk3-HDF2-R1-S2 and are ~10 m apart from each other. The feature was observed to provide seasonal hydrology to downstream areas and may provide seasonal fish habitat, provided barriers to fish are not present further downstream. This section of the HDF is not shown by any available mapping (Photos 32 – 33, Appendix C).

Table 4.1 Headwater Drainage Features Characteristics and Classifications within the Site

Reach				Featur	е Туре			Chan Dimens			y May 2 ydrolog			e May 2 ydrolog			uly 202 ydrolog				Riparia	an Veg	etation	l			errestri Habita			Fish	Habitat		
Headwater Drainage Feature Reach	Length Assessed (m)	Defined Natural Channel	Channelized	No Defined Feature	Swale	Tiled Drainage	Wetland	Feature Width (m)	Bankfull Depth (m)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	None	Lawn	Cropped Land	Meadow	Scrubland	Forest	Wetland	Breeding Amphib. Wetlands	General Amphib. Habitat	Movement Corridors	No Habitat	Year Round	Seasonal	Contributing	Headwater Drainage Feature Description
ECk3- HDF2- R4-S1	75		•	_	ı	_		1.25	0.8	Y	15	<b>Y</b>	N	n/a	N	Z	n/a	Z	l	ı	ı		*	•	<b>&gt;</b>		l I	*	ı	_	_	<b>✓</b>	This medium, channelized feature, shown as a Ditch by geoOttawa (2020), is located along the western boundary of the Site. Located along the boundary of unevaluated wetlands shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021), OMAFRA (2020) and geoOttawa (2020), the feature flows into ECk3-HDF2-R1-S1. The feature was observed to provide seasonal hydrology to downstream areas and may provide seasonal fish habitat, provided barriers to fish are not present further downstream. This section of the HDF is not shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021) or OMAFRA (2020) (Photo 34 – 36, Appendix C).

Table 4.1 Headwater Drainage Features Characteristics and Classifications within the Site

Reach			Feature Type						Channel Dimensions		Early May 2021 Hydrology		Late May 2021 Hydrology		July 2021 Hydrology		Riparian Vegetation					Terrestrial Habitat			Fish Habitat								
Headwater Drainage Feature	Length Assessed (m)	al Channe	Channelized	No Defined Feature	Swal	Tiled Drainage	Wetland	Feature Width (m)	Bankfull Depth (m)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	None	Lawn	Cropped Land	Meadow	Scrubland	Forest	Wetland	Breeding Amphib. Wetlands	General Amphib. Habitat	Movement Corridors	No Habitat	Year Round	Seasonal	Contributing	Headwater Drainage Feature Description
ECk3 HDF2 R4-S2		-		_	. •	-		2.0	1.0	Y	20	N	N	n/a	Z	N	n/a	Z	-	-	-	-	<b>✓</b>	-		_		<b>*</b>	_			<b>~</b>	This ill-defined section of ECk3-HDF2-R4, mapped as a Ditch by geoOttawa (2020), is located within the Trans-Northern Pipelines Inc. right-of-way that is dominated by wet meadow species. The feature was observed to provide seasonal hydrology to downstream areas and is not considered to provide fish habitat. This section of the HDF is not shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021) or OMAFRA (2020) (Photo 37 – 40, Appendix C).
ECk3 HDF2 R4-S3	- 0	-		_	. •	-	_	n/a	n/a	N	n/a	N	N	n/a	N	N	n/a	N	-	_	_	-	_	*	-	_	_	<b>*</b>	-	-	-	<b>√</b>	This small, channelized section of ECk3-HDF2-R4, mapped as a Ditch by geoOttawa (2020), is located within a deciduous woodland that was observed from the southern Site boudnary. The feature was observed to provide seasonal hydrology to downstream areas and is not considered to provide fish habitat. This section of the HDF is not shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021) or OMAFRA (2020).



Headwater Drainage Feature Assessment

### 4.4 MANAGEMENT RECOMMENDATIONS

This section compiles the information collected during Stantec's 2021 reach characteristic and evaluation phase to classify hydrological, riparian, fish and fish habitat and terrestrial components to recommend management decisions for each feature or reach. As outlined in the Guidelines, management recommendations are based on flow characteristics and functions contributing to aquatic and terrestrial habitats (**Table 4.1**). The classification and management recommendation of each reach within the Site are summarized below in **Table 4.2** and shown on **Figure 3**, **Appendix A**.

Table 4.2 Headwater Drainage Feature Classifications and Management Recommendations

Headwater	Sto	ep 1	Step 2	Step 3	Step 4	Management Recommendation		
Drainage Feature Reach	Hydrology	Modifiers	Riparian	Fish Habitat	Terrestrial			
ECk3-HDF1-R1-S1	Contributing	None observed	Important	Contributing	Contributing	Protection		
ECk3-HDF1-R1-S2	Valued	None observed	Important	None	Important	Protection		
ECk3-HDF1-R1-S3	Valued	None observed	Important	None	Important	Protection		
ECk3-HDF1-R2-S1	Contributing	None observed	Important	Contributing	Contributing	Protection		
ECk3-HDF2-R1-S1*	Contributing	None observed	Important	Contributing	Valued	Conservation		
ECk3-HDF2-R1-S2	Contributing	None observed	Important	Contributing	Valued	Conservation		
ECk3-HDF2-R2-S1*	Contributing	None observed	Important	Contributing	Valued	Conservation		
ECk3-HDF2-R3-S1	Contributing	None observed	Important	Contributing	Valued	Conservation		
ECk3-HDF2-R4-S1	Contributing	None observed	Important	Contributing	Contributing	Conservation		
ECk3-HDF2-R4-S2	Contributing	Pipeline RoW Maintenance	Valued	Contributing	Contributing	Conservation		
ECk3-HDF2-R4-S3	Contributing	None observed	Important	Contributing	Contributing	Conservation		

<sup>\*</sup> Denotes access to the feature was not provided. Classifications and management recommendations are estimated based on Stantec observations.

According to the Guidelines, all of the headwater drainage feature reaches on, and immediately adjacent to, the Site are considered to receive Protection or Conservation as a management recommendation.

Based on the concept provided for the Project (**Appendix A**), direct impacts (e.g., re-routing, stormwater inputs) to the assessed headwater drainage features are not anticipated, therefore, all of the assessed values associated with each reach are anticipated to remain functional.

Management recommendations for the Protection and Conservation of the functions of each reach should be considered and implemented through the subsequent design stages of the Project. One of the primary considerations to retain the function of all headwater drainage features on the Site should be to maintain downstream flows to the Spratt Creek municipal drain.



Headwater Drainage Feature Assessment

Where **Table 4.2** recommends Protection of a reach, the following measures from the Guidelines should be considered and incorporated into the design of the Project:

- Protect and/or enhance the existing feature including the riparian vegetation surrounding the feature
- Maintain hydroperiod
- If necessary, use natural channel design techniques to restore and enhance habitat features; realignment not generally permitted
- Design and locate stormwater management system to avoid impacts (e.g., sediment, temperature increases) to the feature

Where **Table 4.2** recommends Conservation of a reach, the following measures from the Guidelines should be considered and incorporated into the design of the Project:

- Maintain, relocate and/or enhance feature including the riparian vegetation surrounding the feature
- If upstream catchment area is proposed to be removed for development, restore lost functions through enhanced lot level controls (i.e., increase infiltration using permeable pavers), as feasible
- Maintain or replace flows using mitigation measures
- Maintain or replace external flows
- Use natural channel design techniques to maintain or enhance overall productivity of the reach

Summary

# 5.0 SUMMARY

As part of this HDFA to to support 8298025 Canada Inc.'s proposed development of the Emerald Creek Phase 3 subdivision, two headwater drainage features, separated into eleven (11) reaches, were observed within Site. Management recommendations for each of the four reaches are based on flow characteristics and functions contributing to aquatic and terrestrial habitats (**Table 4.2**).

Based on the concept provided for the Project (**Appendix A**), direct impacts (e.g., re-routing, stormwater inputs) to the assessed headwater drainage features are not anticipated, therefore, all of the assessed values associated with each reach are anticipated to remain functional. Additionally, the Client is considering installing a corrugated steel culvert under Tullamore Street that will re-connect ECk3-HDF1-R1-S2 and ECk3-HDF1-R1-S1 which will allow flows and nutrients downstream to the Spratt Municipal Drain and may allow potential fish passage to upstream habitats.



References

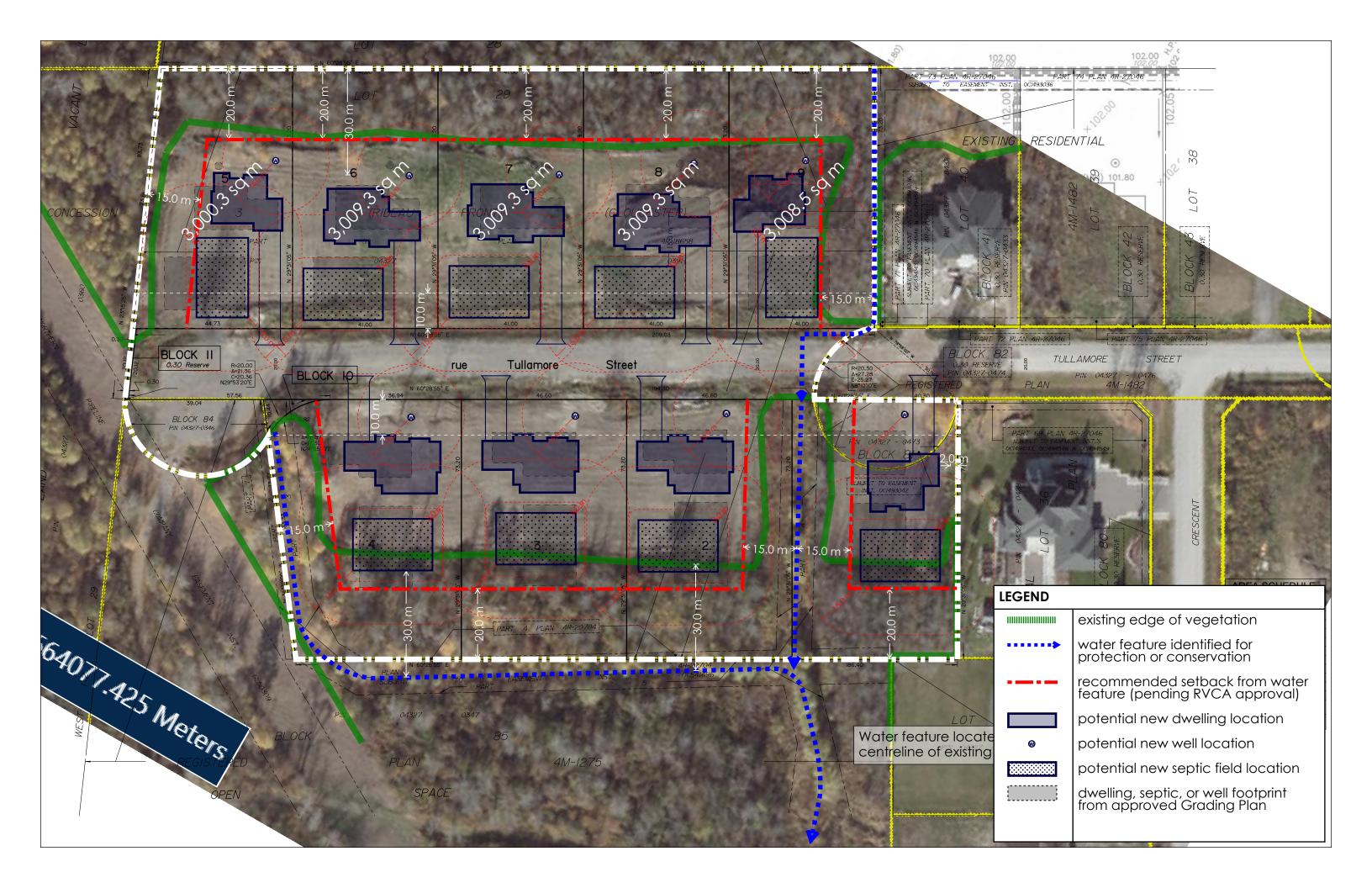
# **6.0 REFERENCES**

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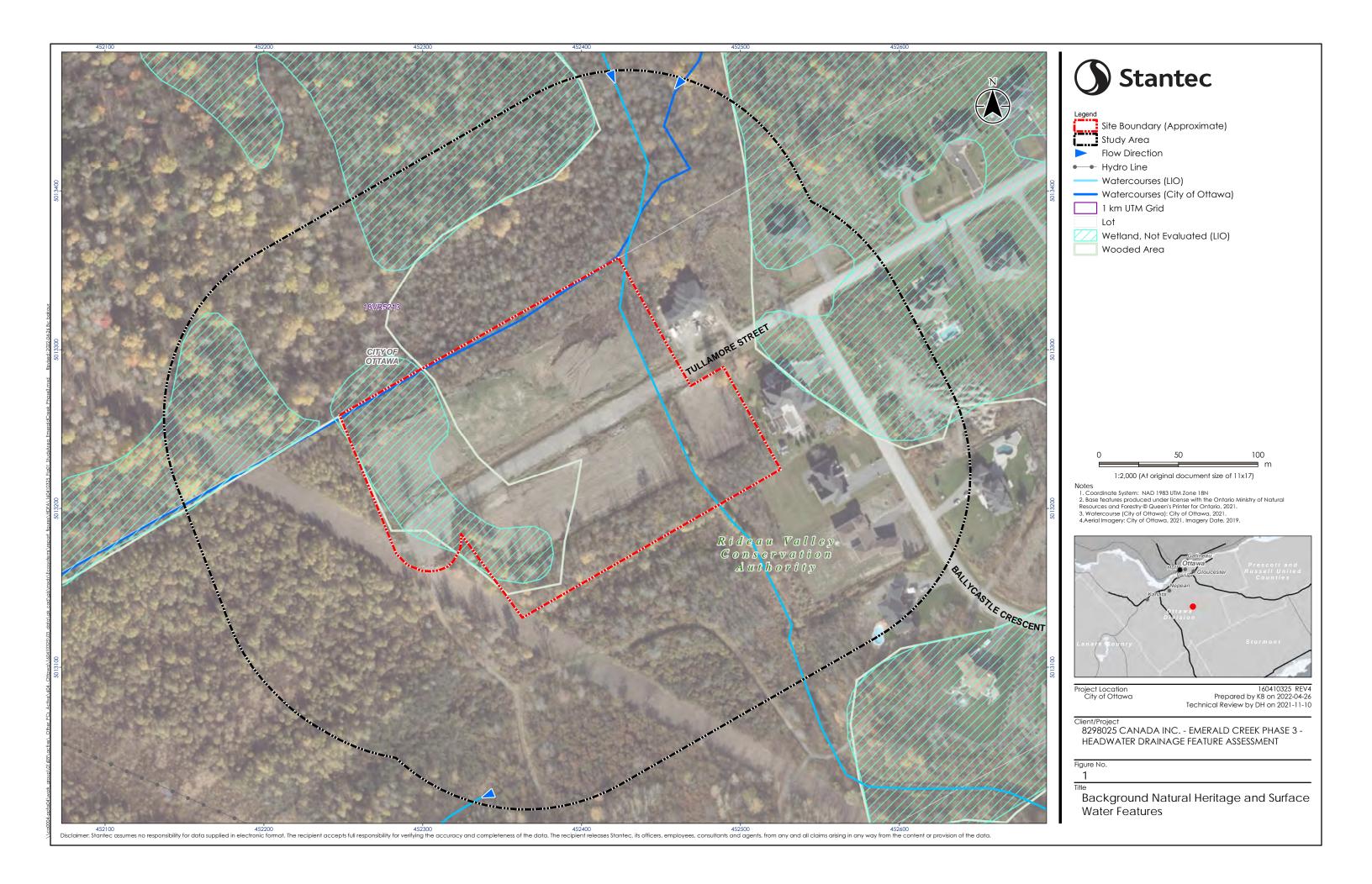
  Evaluation, Classification and Management of Headwater Drainage Features Guidelines. Toronto Region Conservation Authority and Credit Valley Conservation.

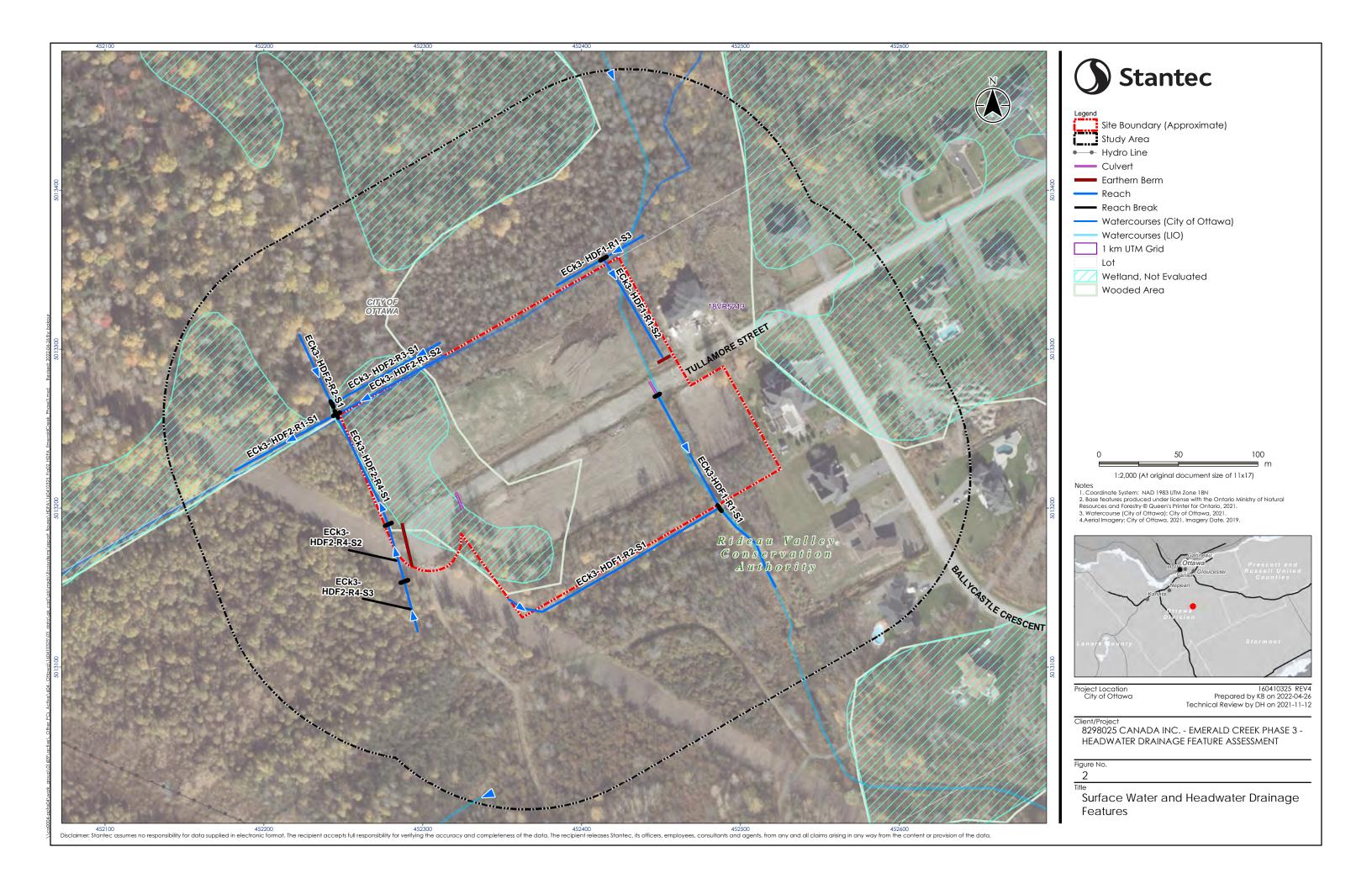


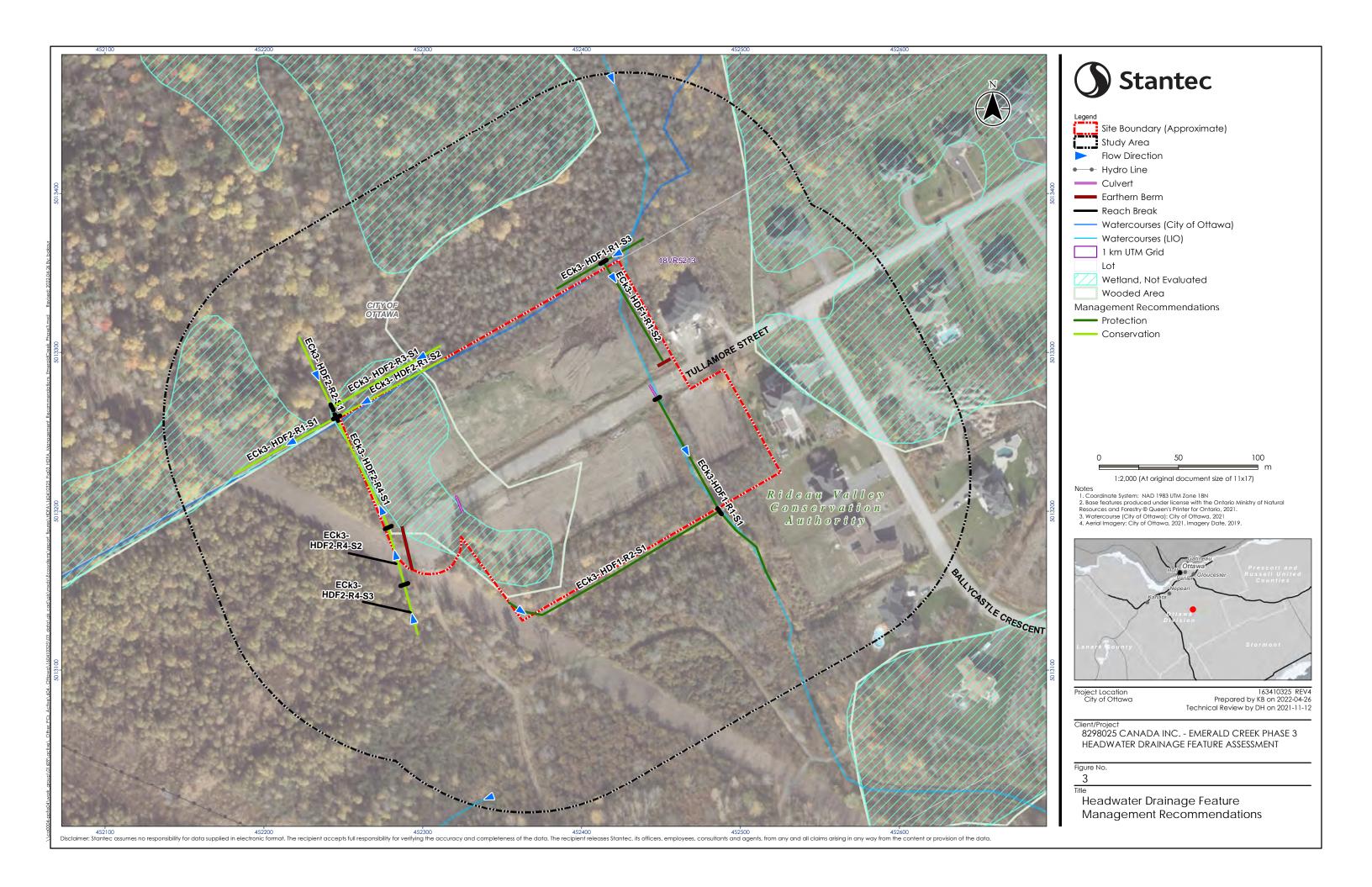
# **APPENDIX A:**Emerald Creek Phase 3 Subdivision Concept



# APPENDIX B: Figures







# **APPENDIX C:** Photographic Record of Site Conditions



Photo 1: Existing conditions within the Site along the Tullamore Street extension (May 27). Looking west from the eastern Site boundary.



**Photo 2:** Existing conditions observed within the existing Emerald Creek subdivision along Tullamore Street immediately east of the Site (May 6).



**Photo 3:** Existing conditions within the previously cleared areas of the Site north of Tullamore Street (May 6). Looking east.



**Photo 4:** Existing conditions within the previously cleared areas of the Site south of Tullamore Street (May 27). Looking north.



**Photo 5:** Existing conditions within the previously cleared areas of the Site south of Tullamore Street (July 30). Looking west.



**Photo 6:** Existing conditions within the Site along the Tullamore Street extension (July 30). Looking east from the western Site boundary.



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**Photo 7:** Existing conditions of ECk3-HDF1-R1-S1 looking south from the Tullamore Street extension (May 6).



**Photo 8:** Existing conditions observed within the middle of ECk3-HDF1-R1-S1 (May 6). Looking south and downstream.



**Photo 9:** Existing conditions of ECk3-HDF1-R1-S1 looking south from the Tullamore Street extension (May 27).



**Photo 10:** Existing conditions observed within the middle of ECk3-HDF1-R1-S1 (May 27). Looking south and downstream.



**Photo 11:** Existing conditions of ECk3-HDF1-R1-S1 looking south from the Tullamore Street extension (July 30).



Photo 12: Looking towards ECk3-HDF1-R1-S2 north from the Tullamore Street extension (May 27). Note earthen berm (red line) isolates this reach from ECk3-HDF1-R1-S1 south of Tullamore Street.



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**Photo 13:** Existing conditions observed within the middle of ECk3-HDF1-R1-S2 (May 6). Looking north and upstream.



**Photo 14:** Existing conditions observed within the middle of ECk3-HDF1-R1-S2 (May 27). Looking north and upstream.



**Photo 15:** Water and substrate conditions observed within ECk3-HDF1-R1-S2 (May 27).



Photo 16: Existing conditions observed within the middle of ECk3-HDF1-R1-S2 (July 30). Looking north and upstream.



**Photo 17:** Existing conditions at the confluence of ECk3-HDF1-R1-S2 and ECk3-HDF1-R1-S3 (May 6). Looking east.



**Photo 18:** Existing conditions observed within the middle of ECk3-HDF1-R1-S3 west of ECk3-HDF1-R1-S2 (May 6). Looking west and upstream.



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**Photo 19:** Existing conditions at the confluence of ECk3-HDF1-R1-S2 and ECk3-HDF1-R1-S3 (May 27). Looking northeast.



**Photo 20:** Existing conditions observed within the middle of ECk3-HDF1-R1-S3 west of ECk3-HDF1-R1-S2 (May 27). Looking west and upstream.



**Photo 21:** Water and substrate conditions observed within ECk3-HDF1-R1-S3 (May 27).



**Photo 22:** Existing conditions at the confluence of ECk3-HDF1-R1-S2 and ECk3-HDF1-R1-S3 (July 30). Looking northeast.



**Photo 23:** Existing conditions observed within the middle of ECk3-HDF1-R1-S3 west of ECk3-HDF1-R1-S2 (May 27). Looking west and upstream.



**Photo 24:** Existing conditions of ECk3-HDF1-R2-S1 south of the Tullamore Street extension (May 6). Looking south and downstream.



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**Photo 25:** Existing conditions observed within the middle of ECk3-HDF1-R2-S1 (May 6). Looking west and upstream.



**Photo 26:** Existing conditions observed within the middle of ECk3-HDF1-R2-S1 (May 27). Looking east and downstream.



**Photo 27:** Existing conditions observed within the middle of ECk3-HDF1-R2-S1 (July 30). Looking east and downstream.



Photo 28: Existing conditions observed within ECk3-HDF2-R1-S1 along the western boundary of the Site (May 27). Looking west and downstream.



Photo 29: Existing conditions observed at the confluence of ECk3-HDF2-R2-S1 and ECk3-HDF2-R3-S1 (May 27) at the northwest corner of the Site. Looking north and upstream.



Photo 30: Existing conditions observed within the middle of ECk3-HDF2-R1-S2 (May 6). Looking east and upstream.



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**Photo 31:** Existing conditions observed within the middle of ECk3-HDF2-R1-S2 (May 6). Looking east and upstream.



**Photo 32:** Existing conditions observed within the middle of ECk3-HDF2-R3-S1 (May 6). Looking east and upstream.



**Photo 33:** Existing conditions observed within the middle of ECk3-HDF2-R3-S1 (May 27). Looking east and upstream.



**Photo 34:** Existing conditions observed within the middle of ECk3-HDF2-R4-S1 (May 6). Looking south and upstream.



**Photo 35:** Existing conditions observed within the middle of ECk3-HDF2-R4-S1 (May 27). Looking south and upstream.



**Photo 36:** Existing conditions observed within the middle of ECk3-HDF2-R4-S1 (July 30). Looking north and downstream.



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Photo 37: Existing conditions of the ECk3-HDF2-R4-S2 (May 6) within the Trans-Northern Pipelines Inc. right-of-way. Looking northwest.



**Photo 38:** Existing conditions observed within the middle of ECk3-HDF2-R4-S2 (May 6). Looking northwest and downstream.



Photo 39: Existing conditions observed within the middle of ECk3-HDF2-R4-S2 (May 27). Looking northwest and downstream.



Photo 40: Existing conditions observed within the middle of ECk3-HDF2-R4-S2 (July 30). Looking northwest and downstream.



**Photo 41:** Existing conditions observed within the northeast corner of the Site that has not been filled and graded within the limits of the geoOttawa unevaluated wetland (May 6). Looking north towards ECk3-HDF1-R1-S3.

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Photo 42: Existing conditions observed within the northeast corner of the Site that has not been filled and graded within the limits of the geoOttawa unevaluated wetland (May 6). Looking northeast towards ECk3-HDF1-R1-S2.



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Photo 43: Existing conditions observed within the northeast corner of the Site that has not been filled and graded within the limits of the geoOttawa unevaluated wetland (May 27). Looking northeast towards ECk3-HDF1-R1-S2.



Photo 44: Existing conditions observed within the northeast corner of the Site that has not been filled and graded within the limits of the geoOttawa unevaluated wetland (July 30). Looking northeast towards ECk3-HDF1-R1-S2.



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## **APPENDIX D:** Field Data Sheets

		į	Inconstrair	ned Headwate	r Drainage Feature	Assessment
Date:	May	1 702	/ Proje	eci#: \Carylog	95 Recorder/Crev	v. J. Marsell B. Obamalis
Stream Nan				am Code: Sp. att		SMD-UCB-A.
Site Limits:	-0	Upstream 16		J446E 503!		
2010/40/0320		Downstream		_	3/99 N	☐ Sample 2 ☐ Not connected
Direction of	Assessment		( Upst		ownstream	☐ Sample 3 to downstream network
Flow Influe	ence	☐ Fres		,	Spate (2)	☐ Baseflow (3)
Flow Cond	lition	Dry Star	(1) Inding Water (2)		☐ Interstitial Flow (3) ☐ Minimal Flow (4)	☐ Substantial Flow (5)
Feature Ty	pe	☐ Defi	ned Natural Char nnelized or Cons		☐ No Defined Feature (4) ☐ Tiled Feature (5)	☐ Roadside Ditch (8)
Eastura Va			ti-thread (3)	П о	Wetland (6)	☐ Pond (9)
Feature Ve	egetation	☐ None (1)	☐ Lawn (2)	☐ Cropped (3)	☐ Meadow (4) Ø Scri	ubland (5) Wetland(6) Forest (7)
Riparian V	egetation					
0 - 1.5 m	Left Bank Right Bank	□ None (1) □ None (1)	□ Lawn (2) □ Lawn (2)	□ Cropped (3) □ Cropped (3)	☐ Meadow (4) ☐ Scrubl	
1.5 - 10 m	Left Bank Right Bank	□ None (1) □ None (1)	☐ Lawn (2) ☐ Lawn (2)	☐ Cropped (3) ☐ Cropped (3)	☐ Meadow (4) ☐ Scru ☐ Meadow (4) ☐ Scru	
10 - 30 m	Left Bank Right Bank	☐ None (1) ☐ None (1)	☐ Lawn (2) ☐ Lawn (2)	☐ Cropped (3) ☐ Cropped (3)	☐ Meadow (4) Scri	
Distance (r				Elevation (cm)		Gradient (%): O (Lo~)
	Substrate (S	2.M3)	y (Hard Pan)	Silt, Sand (0.0	6-2 mm) Gravel (22-66 mm)	Cobble (67-249 mm) Boulder (250 mm) Bedrock
Sub-Domi	nant Substra	2.M3) te (S2.M3)				
Sub-Domi	nant Substra	2.M3) te (S2.M3)	< 10% Minimal	(1) 10-4	0% Moderate (2) 40 -	Cobble (67-249 mm) Boulder (250 mm) Bedrock  Government
Sub-Domin Feature Ro Width Mea Channel D	nant Substra	2.M3) te (S2.M3)  Can't Me: Feature Width	10% Minimal asure (1) (m):	(1) 10 - 4 Bankfull (2) [	0% Moderate (2) 40 -  Mean Width (3) Esti	60% High (3)
Sub-Domin Feature Ro Width Mea Channel D Entrenchm	nant Substra	2.M3) te (S2.M3)  Can't Me: Feature Width	(m): A value of the control of the	(1)	0% Moderate (2) 40 -  Mean Width (3) Esti  Bankfull Depth (mr	60% High (3)
Sub-Domin Feature Ro Width Mea Channel D Entrenchm	nant Substra	2.M3) te (S2.M3)  Can't Me: Feature Width	10% Minimal asure (1) (m):	(1)	0% Moderate (2) 40 -  Mean Width (3) Esti	60% High (3)
Sub-Domin Feature Ro Width Mea Channel D Entrenchm	nant Substra	2.M3)  te (S2.M3)  Can't Me:  Feature Width  otal: > 40  Wetted D	< 10% Minimal asure (1) (m): < 40 Culvert (1)	(1)	O% Moderate (2) 40 - O% Mean Width (3) Esti Bankfull Depth (mr m Right Bank Head (2) Distance m) Volume (L)	60% High (3)
Sub-Domini Feature Ro Width Mea Channel D Entrenchm Surface Flo Wetted	nant Substra	2.M3)  te (S2.M3)  Can't Me:  Feature Width  otal: > 40  Wetted D  Adjacent  Feature	(m): < 40  Culvert (1)  epth (mm) 2	(1)	O% Moderate (2) 40 - O% Moderate (2) 40 - Omegan Width (3) Esti  Bankfull Depth (mr  m Right Bank  Head (2) Distance  m) Volume (L)  3 1 2 3	Gully (4)   Outlet Scour (5)   Outlet Scour (5)   Gully (4)   Outlet Scour (5)   Outlet
Sub-Domini Feature Ro Width Mea Channel D Entrenchm Surface Flo Wetted	nant Substra	2.M3)  te (S2.M3)  Can't Me:  Feature Width otal: > 40  Wetted D  Adjacent	Culvert (1) Sheet Eros None (1) Sheet Eros Sheet Eros Sheet Eros	(1)	O% Moderate (2)	Gully (4)   Outlet Scour (5)   O

iva's	401912	DV - 10	Uncons	trained Headwater Drainage Feature Assessment Pg 2 of 2  Field Assessment: Sample #1 Sample #2 Sample #3
~~	- Committee (	***************************************		POINT FEATURE DATA
Ground	water Indical	ors U	None	Perched Height (mm):   Perched Height (mm):  Jumping Height (mm):
WP#	Photo#	Code	Category	Description
				Historically converted to SMO-well-A Leath been blocks flow. Leath been reconcioned as SMO-well-A dat sheet.
Site B	reak 👿	upstrarrice Feature Typ	eam ;	s dry (approx 100m)  ent (vock, brem) on collector  ure Modifier  Flow Conditions  Feature Vegetation  Riparian Vegetation
Point Categ	Data		Ongoing and A	Active (1) Historic Evidence (2) Reported but No Evidence (3) 4) Unknown (5)
ABCDEFGHIJKLMZOPG	Seepage are Watercress - Outlet (tile or Inlet (tile or or Beaver dam Manmade da Other barrier Potential con Channel hard Culvert - note Flow transitio Flow transitio	a - measure or estimate total other) - record ther) - record ther) - record ther) - record ther) - record there as a record to fish movem tamination social type, size and n point D/S - fin point M/S- flor point D-S/IF d during non-ficient source	restimate length of surface area occur flow status as per ched height and justiched height and justiched height and ent area (storm sewer led by rip-rap, arm d whether or not pow condition character of the state o	refeature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature.  feature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec.  Imping height  d jumping height.  outlet or industrial discharge pipe).  four stone, or gabion baskets.  erched. If perched record perched height and jumping height.  finges from dry to standing water, independent of segment break  figes from minimal to substantial surface flow, independent of segment break  anges from dry/standing water to interstitial flow, independent of segment break

	Unconstrained Headwater Drainage Feature Assessment
Date: May (a) Stream Name: Site Limits: Constant Direction of Assessment:	Upstream Code: SPU MO WC Site Code: SMO - WC - A  Upstream No. WP# 45240 E 533556 M Field Assessment: Sample 1 Unconnected HDF:  Downstream WP# 452450 E 543264 M Sample 2 Mot connected  Upstream Downstream Downstream Downstream Downstream network
Flow Influence	Freshet (1) > A Spate (2)
Flow Condition	□ Dry (1) □ Interstitial Flow (3) □ Substantial Flow (5) □ Standing Water (2) □ Minimal Flow (4)
Feature Type	□ Defined Natural Channel (1) □ No Defined Feature (4) □ Swale (7) □ Channelized or Constrained (2) □ Tiled Feature (5) □ Roadside Ditch (8) □ Multi-thread (3) □ Wetland (6) □ Pond (9)
Feature Vegetation	□ None (1) □ Lawn (2) □ Cropped (3) □ Meadow (4) □ Scrubland (5) ₩ Wetland(6) □ Forest (7)
Riparian Vegetation  0 - 1.5 m Left Bank V  Right Bank	None (1)
1.5 - 10 m Left Bank Right Bank	None (1)
10 - 30 m Left Bank Right Bank	□ None (1)         □ Lawn (2)         □ Cropped (3)         ♠ Meadow (4)         □ Scrubland (5)         □ Wetland (6)         □ Forest (7)           □ None (1)         ♠ Lawn (2)         □ Cropped (3)         □ Meadow (4)         □ Scrubland (5)         □ Wetland (6)         □ Forest (7)
Distance (m):  Dominant Substrate (S2 Sub-Dominant Substrat	
Feature Roughness Width Measurement	☐ < 10% Minimal (1) ☐ 10 - 40% Moderate (2) ☐ 40 - 60% High (3) ☐ > 60% Extreme (4) ☐ Can't Measure (1) ☐ Bankfull (2) ☐ Mean Width (3) ☐ Estimated (4) ☐ GIS (5) ☐ Measure/GIS (6)
Channel Dimensions	Feature Width (m): Bankfull Depth (mm) N/A
	al: >40 m Cotal width Many m Right Bank m Total width Many m
Surface Flow Method	Perched Culvert (1) Hydraulic Head (2) Distance by Time (3) Estimated (4)  Wetted Perth (mm) Hydraulic head (mm) Volume (1)
Wetted Width (m)  Wo Flour	Wetted Depth (mm)         Hydraulic head (mm)         Volume (L)         Distance (m)         Time (s)           1         2         3         1         2         3         1         2         3           20/20/20         N/M         N/M         N/M         N/M
Sedimani Frankpon	Adjacent None (1) Rill (2) Rill and Gully (3) Gully (4) Outlet Scour (5)  Sheet Erosion (6) Instream Bank Erosion (7) Other (8)  Feature None (1) Rill (2) Rill and Gully (3) Gully (4) Outlet Scour (5)  Sheet Erosion (6) Instream Bank Erosion (7) Other (8)
2.2	Measures (mm).       ☐       Moderate: 5-30 mm (3)       ☐       Substantial: 31-80 mm (4)       ☐       Extensive: > 80 mm (5)

N	امرهای	21		strained Headwater Drainage Feature Assessment Pg. 2 of 2 Field Assessment: Sample # 1 Sample # 2 Sample # 3
	w	er	-,50	POINT FEATURE DATA
2	rier Measurem	WP#	None	Perched Height (mm):  Perched Height (mm):  Seepage  Watercress  Seepage  Present  Comment:  Jumping Height (mm):  Jumping Height (m
WP#	Photo #	Code	Category	Description
				Earther borner stoced at DIS section along Tullance Street. SMD-wcl-A is not cornected to DIS Section. Permonel Sist borner.
				Pics - 2950 - 59
Gite Bre	eak 🔲 f	yor +L ea Feature Typ Other: Con	e <b>I</b> Feat	stc has marsh-like habitat w cattail.  ture Modifier  Flow Conditions  Feature Vegetation  Riparian Vegetation
oint Dategor	ata	Janor. 'Con	Ongoing and	Active (1) Historic Evidence (2) Reported but No Evidence (3) (4) Unknown (5)
A	Seepage area Vatercress - e Dutlet (tile or o nlet (tile or oth Beaver dam - r	- measure or stimate total ther) - record er) - record f neasure pero - measure p	estimate length surface area occ I flow status as p low status as per ched height and j perched height ar	per feature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature.  r feature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec.

Unconstrained Headwater	r Drainage Feature Assessment
Site Limits: Upstream VST WP# 452365E 50  Gogle Could Downstream VST WP# 45240E 50  Direction of Assessment Downstream Direction of Assessment	Recorder/Crew: 5 Massell B. Clearager  MD W C Site Code: 5 MO - UCI - B  Sample 1 Unconnected HDF:  Sample 2 I Not connected  ownstream
Flow Influence	Spate (2) 🔲 Baseflow (3)
Flow Condition Dry (1)  Standing Water (2)	☐ Interstitial Flow (3) ☐ Substantial Flow (5) ☐ Minimal Flow (4)
Feature Type  Defined Natural Channel (1) Channelized or Constrained (2) Multi-thread (3)	□ No Defined Feature (4) □ Swale (7) □ Tiled Feature (5) □ Roadside Ditch (8) ■ Wetland (6) □ Pond (9)
Feature Vegetation ☐ None (1) ☐ Lawn (2) ☐ Cropped (3)	☐ Meadow (4) ☐ Scrubland (5) Wetland(6) ☐ Forest (7)
Riparian Vegetation  0 - 1.5 m Left Bank	☐Meadow (4) ☐Scrubland (5) ☐Wetland (6) ☐Forest (7) ☐ Meadow (4) ☐ Scrubland (5) ☐ Wetland (6) ☐Forest (7)
1.5 - 10 m Left Bank ☐ None (1) ☐ Lawn (2) ☐ Cropped (3)  Right Bank ☐ None (1) ☐ Lawn (2) ☐ Cropped (3)	Meadow (4) Scrubland (5) Wetland (6) Forest (7)  Meadow (4) Scrubland (5) Wetland (6) Forest (7)
10 - 30 m Left Bank ☐ None (1) ☐ Lawn (2) ☐ Cropped (3)  Right Bank ☐ None (1) ☐ Lawn (2) ☐ Cropped (3)	Meadow (4) ☐ Scrubland (5) ☐ Wetland (6) ☐ Forest (7) ☐ Meadow (4) ☐ Scrubland (5) ∰ Wetland (6) ☐ Forest (7)
Distance (m):  Clay (Hard Pan)  Silt  Sand (0.0  Dominant Substrate (S2.M3)  Sub-Dominant Substrate (S2.M3)	
<u> </u>	40% Moderate (2)
Entrenchment 174 Total: 3 > 40 m	m Right Bank m Total width m
Surface Flow Method Perched Culvert (1) Hydraulic  Wetted Width (m) Wetted Depth (mm) Hydraulic head (m	nm) Volume (L) Distance (m) Time (s)
Adjacent None (1) Rill (2)  Sheet Erosion (6)  Feature None (1) Rill (2)  Sheet Erosion (6)  Sheet Erosion (6)	Rill and Gully (3) Gully (4) Outlet Scour (5) Instream Bank Erosion (7) Other (8) Rill and Gully (3) Gully (4) Outlet Scour (5) Instream Bank Erosion (7) Other (8)
Sediment Deposition Measures (mm):  None (1) Minimal: < 5 mm (2) Moderate: 5-30 mm	n (3) Substantial: 31-80 mm (4) Extensive: > 80 mm (5)

Dar .	May w/o	O) 340			/ater Drainage Fe Field Assessment:		ent  Sample # 2	Pg. 2 of 2 Sample # 3
***	Street Street	The same of the same of			FEATURE DA			
Ground	arrier Measurer Iwater Indicat	wP#	None	Perched Height (mm) Perched Height (mm) Watercress	Jumping	Height (mm): Height (mm):	Other:	-
WP#	Photo #	Code	Category			Description		
				See hor	ner dala C	-CMC x	ng-7.	
Site B	reak	Feature Typ		ture Modifier	(In leep	☐ Feature Veget	ation Ripar	ian Vegetation
Point Categ	Data		Ongoing and		Historic Evidence (2	2) Reported but I	No Evidence (3)	* westerd propo
-	DATA KEY:		NO EVIDENCE	.41	Olikilowii (O)			30000
АВСОЕГСНІ ЈК L М Z ОР	Spring/upwel Seepage are Watercress - Outlet (tile or o Beaver dam Manmade da Other barrier Potential con Channel hard Culvert - note Flow transitio Flow transitio	a - measure or estimate total other) - record ther) - record from measure percord measure percord in measure percord in measure percord in movement amination source in point D/S - flow point D/	estimate length surface area occ if flow status as pelow status as pelow status as pelowed height and judicial perched height are ent orce (storm sewelled by rip-rap, and whether or not ow condition challed by condition challed by condition challed by condition challed in the state of the s	er feature flow. Estimate reature flow. Estimate umping height and jumping height r outlet or industrial dis mour stone, or gabion perched. If perched re anges from dry to standages from minimal to hanges from dry/standages from dry/	ge occurs  ate volume <0.5 l/sec or >0  e volume to be <0.5 l/sec or >0  scharge pipe).	or >0.5 l/sec.  umping height.  If segment break  ndependent of segment	l break	

las

	Unconstrained Headwater	r Drainage Feature Assessment
Date: May 6	DCD1 Project#: \Cock\co	
Stream Name, Sw	10. WC3 - B Stream Code: Spece	HMD WETTE CODE: SMO - WC3-B
Site Limits		Sample 1 Unconnected HDF:
Direction of Assessment		ownstream   Sample 3 to downstream network
Flow Influence	☐ Freshet (1)	Spate (2) 🔲 Baseflow (3)
Flow Condition	☐ Dry (1)  Standing Water (2)	☐ Interstitial Flow (3) ☐ Substantial Flow (5) ☐ Minimal Flow (4)
Feature Type	Defined Natural Channel (1) Channelized or Constrained (2) Multi-thread (3)	□ No Defined Feature (4)         □ Swale (7)           □ Tiled Feature (5)         □ Roadside Ditch (8)           □ Wetland (6)         □ Pond (9)
Feature Vegetation	☐ None (1) ☐ Lawri (2) ☐ Cropped (3)	☐ Meadow (4) Scrubland (5) ☐ Wetland(6) ☐ Forest (7)
Riparian Vegetation		
0 - 1.5 m Left Bank Right Bank	□ None (1) □ Lawn (2) □ Cropped (3) □ None (1) □ Lawn (2) □ Cropped (3)	Meadow (4)
1.5 - 10 m Left Bank Right Bank	□ None (1)         □ Lawn (2)         □ Cropped (3)           □ None (1)         □ Lawn (2)         □ Cropped (3)	☐ Meadow (4) Scrubland (5) ☐ Wetland (6) ☐ Forest (7) ☐ Meadow (4) Scrubland (5) ☐ Wetland (6) ☐ Forest (7)
10 - 30 m Left Bank Right Bank	☐ None (1) ☐ Lawn (2) ☐ Cropped (3) ☐ None (1) ☐ Lawn (2) ☐ Cropped (3)	Meadow (4) Scrubland (5) Wetland (6) Forest (7) Meadow (4) Scrubland (5) Wetland (6) Forest (7)
Distance (m): * P P P P P P P P P P P P P P P P P P	Clay (Hard Pan) Silt Sand (0.00	6-2 mm) Gravel (22-66 mm) Cobble (67-249 mm) Boulder (250 mm) Bedrock
Feature Raughness	☐ < 10% Minimal (1) ☐ 10 - 4	0% Moderate (2) 40 - 60% High (3) > 60% Extreme (4)
Width Measurement		☐ Mean Width (3) ☐ Estimated (4) ☐ GIS (5) Measure/GIS (6)
Channel Dimensions		Bankfull Depth (mm)
	otal: > 40 m	m Right Bankm Total widthm
Surface Flow Method	☐ Perched Culvert (1) ☐ Hydraulic	Head (2) Distance by Time (3) Estimated (4)
Wetted Width (m)  * No Class	Wetted Depth (mm) Hydraulic head (mi	m) Volume (L) Distance (m) Time (s) 3 1 2 3 1 2 3
Sediment Transport	Adjacent None (1) Rill (2)  Sheet Erosion (6)  Feature None (1) Rill (2)  Sheet Erosion (6)  Measures (mm):	☐ Rill and Gully (3) ☐ Gully (4) ☐ Outlet Scour (5) ☐ Instream Bank Erosion (7) ☐ Other (8) ☐ Rill and Gully (3) ☐ Gully (4) ☐ Outlet Scour (5) ☐ Instream Bank Erosion (7) ☐ Other (8)
The second secon	1 Minimal: < 5 mm (2) ☐ Moderate: 5-30 mm	(3) Substantial: 31-80 mm (4) Extensive: > 80 mm (5)

) }	طوردك	(Po					ature Assessn	-	mple # 2	Pg. 2 of 2 Sample # 3
-		- Va		PO	INT FEAT	URE DAT	ΓΑ			
iround	n er Measurer water Indicat Hection	#9W	None	Perched Height Perched Height Watercress Present	A CO	Jumping	Height (mm): Height (mm):  Stained	Oth	ier:	
WP#	Photo#	Code	Category				Description			
				Rad			burnet (			
				16.	T 45	2456E	500	1131	):	
Additi	ional Notes	. ,	/							
Site B		Feature Typ		ure Modifier	☐ Flow (	Conditions	☐ Feature Veg	etation	Ripa	rian Vegetation
Point I	Data		Ongoing and A			ic Evidence (2 own (5)	Reported bu	t No Evid	ence (3)	
100 000	DATA KEY:					A 8				
A B C D E F G H ( J K L M N O P C	Seepage are Watercress - Outlet (tile or Inlet (tile or or Beaver dam Manmade da Other barrier Potential con Channel hard Culvert - note Flow transitio Flow transitio Flow transitio Fish observe Potential nutr	a - measure of estimate total other) - record ther) - record ther) - record ther) - record ther) - record there is a measure per to fish movem tamination southering - indicate type, size and point D/S - fin point M/S- fin point D-S/IF diduring non-ficient source	flow status as per ched height and jo perched height and pent urce (storm sewer ted by rip-rap, arr d whether or not p low condition challow condition challow	of bank where si upied er feature flow. Es feature flow. Es umping height d jumping heigh coutlet or indust mour stone, or g perched. If perchanges from dry to nages from dry to nages from dry	eepage occurs  Estimate volume  stimate volume to  nt  rial discharge pip abion baskets, ned record perch o standing water, nal to substantial	e).  ed height and juindependent or surface flow, in	umping height.	ent break		
2	Oredging of a Offline pond Other	nannel								

		Uncon	strained Headwate	r Drainage Feature Asse	essment
Date:	May	6, 200	Project#: Vacyos	25 Recorder/Crew:	5 Marsell B. Obsermager.
Stream Nar	TIE.	10- W(Z-1	Stream Code: Spral	MD W Site Code:	SMD-WC2-AA
Site Limits:		Upstream 187 Wi		OSDAGN Field Assessment:	Sample 1 Unconnected HDF:
4		· Downstream Wi			☐ Sample 2 ☐ Not connected
Direction of	Assessment.	1		Downstream	☐ Sample 3 to downstream networ
Flow Influe	ence	☐ Freshet (1)		Spate (2)	☐ Baseflow (3)
Flow Cond	lition	☐ Dry (1) ☐ Standing Wa	ler (2)	Interstitial Flow (3) Minimal Flow (4)	☐ Substantial Flow (5)
Feature Ty	pe	☐ Defined Natu		☐ No Defined Feature (4)	Swale (7)
		Channelized		☐ Tiled Feature (5)	Roadside Ditch (8)
-		☐ Multi-thread (		☐ Wetland (6)	Pond (9)
Feature Ve	getation	□ None (1) □ La		☐ Meadow (4) ☐ Scrubland	
Students de	Contract Contract				
Riparian V 0 - 1.5 m	Left Bank Right Bank	□None (1) □Lawn □ None (1) □ La	A de la constant de l	☐Meadow (4) ☐ Scrubland (5) ☐ Meadow (4) ☐ Scrubland	
1.5 - 10 m	Left Bank Right Bank	□ None (1) □ La □ None (1) □ La		☐ Meadow (4) ☐ Scrubland ☐ Meadow (4) ☐ Scrubland	
10 - 30 m	Left Bank Right Bank	☐ None (1) ☐ La ☐ None (1) ☐ La		☐ Meadow (4) ☐ Scrubland ☐ Meadow (4) ☐ Scrubland	
Distance (n	n);NA	Ma	Elevation (cm	in Ma	Gradient (%): Low Low
Dominant	Substrate (S	Veri	an) Sift Sand (0.0		Gradient (%).
Dominant		2.M3) te (S2.M3)	an) Silt Sand (0.0	06-2 mm) Gravel (22-66 mm) Cob	ble (67-249 mm) Boulder (250 mm) Bedrock
Dominant	Substrate (S	2.M3) te (S2.M3)	an) Silt Sand (0.0	06-2 mm) Gravel (22-66 mm) Cob	ble (67-249 mm) Boulder (250 mm) Bedrock
Dominant Sub-Domi	Substrate (S nant Substra pughness	2.M3) te (S2.M3)	an) Silt Sand (0.0	06-2 mm) Gravel (22-66 mm) Cob	ble (67-249 mm) Boulder (250 mm) Bedrock
Dominant Sub-Domin Feature Ro Width Mea Channel D	Substrate (S nant Substra bughness surement imensions	2.M3)  te (S2.M3)	An) Sift Sand (0.0	106-2 mm) Gravel (22-66 mm) Cob  107	ble (67-249 mm) Boulder (250 mm) Bedrock
Dominant Sub-Domin Feature Ro Width Mea Channel D	Substrate (S nant Substra bughness surement	2.M3)  te (S2.M3)  Can't Measure (1)  Feature Width (m):	Minimal (1)	106-2 mm) Gravel (22-66 mm) Cob  107	Gradient (%).
Dominant Sub-Domin Feature Ro Width Mea Channel D Entrenchm	Substrate (S nant Substra bughness surement imensions	2.M3)  te (S2.M3)	Minimal (1)	106-2 mm) Gravel (22-66 mm) Cob  107	ble (67-249 mm) Boulder (250 mm) Bedrock
Dominant Sub-Domin Feature Ro Width Mea Channel D Entrenchm	Substrate (S nant Substra bughness surement imensions nent 12 To	2.M3)  te (S2.M3)  Can't Measure (1)  Feature Width (m):  Atal:  Perched Culvert (1)  Wetted Depth (mr	Minimal (1)	Gravel (22-66 mm) Cob  Gravel (22-66 mm) Cob  Gravel (22-66 mm) Cob  Gravel (22-66 mm) Cob  Gravel (23-66 mm) Cob  Gravel (23-66 mm) Cob  Gravel (23-66 mm) Cob  Estimated (20 Estimated (20 mm)  Mean Width (3) Estimated (20 Estimated (20 mm)  Manual Post Bank  Gravel (22-66 mm) Cob  Gravel (23-66 m	ble (67-249 mm) Boulder (250 mm) Bedrock
Dominant Sub-Domin Feature Ro Width Mea Channel D Entrenchm Surface Flo Wetted	Substrate (Sinant Substrational Substrate (Sinant Substrational Substrational Substrate (Sinant Substr	te (S2.M3)  Can't Measure (1)  Feature Width (m):  tal:  Perched Culvert (1)	Minimal (1)	Gravel (22-66 mm) Cob	ble (67-249 mm) Boulder (250 mm) Bedrock
Dominant Sub-Domin Feature Re Width Mea Channel D Entrenchm Surface Fle Wetted	Substrate (Sinant Substrate (S	2.M3)  te (S2.M3)  Can't Measure (1)  Feature Width (m):  Perched Culvert (1)  Wetted Depth (mr  1 2	Minimal (1)  Bankfull (2)  (40 m Left Bank  Hydraulic  Hydraulic head (m  3 1 2	Gravel (22-66 mm) Cob  One of the color of t	Gradient (%).
Dominant Sub-Domin Feature Re Width Mea Channel D Entrenchm Surface Fle Wetted	Substrate (Sinant Substration Substrate (Sinant Substration Substrate (Sinant Substr	2.M3)  te (S2.M3)  Can't Measure (1)  Feature Width (m):  Perched Culvert (1  Wetted Depth (mr  1 2  1 0  Adjacent  No  Feature  No	Minimal (1)	Gravel (22-66 mm) Cob  Estimated (20	Gradient (%).
Dominant Sub-Domin Feature Re Width Mea Channel D Entrenchm Surface Fle Wetted	Substrate (Sinant Substrate (S	2.M3)  te (S2.M3)  Can't Measure (1)  Feature Width (m):  Perched Culvert (1  Wetted Depth (mr  1 2  1 0  Adjacent  No  Feature  No	Minimal (1)  Bankfull (2)  (40 m Left Bank  Hydraulic head (m  3 1 2  ne (1) Rill (2)  Rill (2)	Gravel (22-66 mm) Cob	Gradient (%).

+SMD-UCD-AC rod Soupled

+ SMD-WC2-A rd sampled.

			Uncor	strained Head	dwater Dra	ainage Fe	ature Asses	sment	Pg. 2 of 2
Corto	Marchan	· · · ·		40305		-			
	10/10/10	F7						Campio	
	open, open printed the orange particular and and		Million, car at a River Million and Allendaria		NT FEAT				
Fish Ba	arrier Measurement			Perched Height (m			Height (mm):	Nove d	Spark
		WP#	-	Perched Height (m			Height (mm):		
Ground	water Indicators		Products				Stained	Other:	
Fish Co	llection		Absent	Present C	Comment:	Nove	descried.		
WP#	Photo#	Code	Category				Description		
-			,	<del> </del>					
			-		A -				
					/ AC				
				1	<u> </u>				
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Addit	ional Notes:					11	1	1 /	y "
	2 4 6	eu to	4	0- 12m	Nor	th 1	5 Iden	ticle	
_	both	Flo	w in-	16 WC	2-A	. 2	amed	Sm	o-wcz-AB
Site B	reak 🍱 Fea	ature Typ	e 🗆 Fe	ature Modifier	☐ Flow C	Conditions	☐ Feature Ve	egetation $\square$	Riparian Vegetation
Trigge		ner: Con							
Point			Ongoing and	Active (1)	Histori	c Evidence (2	2) Reported I	out No Evidence	(3)
Categ				: (4)		wn (5)	,		
	DATA KEY:								
A	, , ,			).5 l/sec; measure te n of bank where see					
B C	Watercress - estir				page occurs				
D	Outlet (tile or other	r) - record	flow status as	per feature flow. Est	timate volume «	<0.5 l/sec or >0	0.5 l/sec. Measure	temperature.	
Ε	Inlet (tile or other)	- record f	low status as p	er feature flow. Estin	nate volume to	be <0.5 l/sec o	or >0.5 l/sec.		
F	Beaver dam - me								
G H	Other barrier to fis			and jumping height			*		
l'	Potential contami	nation sou	irce (storm sew	er outlet or industrial	l discharge pipe	e).			
J	Channel hardenin	g - indicat	ed by rip-rap, a	rmour stone, or gabi	ion baskets.				
K	Culvert - note type	s, size and	d whether or no	perched. If perched	record perche	ed height and ju	umping height.		
L M	Flow transition po	int D/S - 11	ow condition ch	langes from dry to stanges from minimal	to substantial	surface flow in	i segment break idependent of seo	ment break	
N	Flow transition po	int D-S/IF	- flow condition	changes from dry/st	landing water to	o interstitial flow	w, independent of	segment break	
0	Fish observed dur	ing non-fi							
Р	Potential nutrient								
Q	Dredging of chanr Offline pond	iel							
	Other								

Date:	1	May 6	, 202/ Proje	ct#: Yaryon	DS Rec	order/Crew:	5 Morsell !	B. Oberniger.
Stream Nan				m Code: Sprey		Code:	5MD -W	C2-AB.
Gite Limits:		Upstream \ Downstream	87 WP# W		CARONN Field		Sample 1  Sample 2	Unconnected HDF:  Not connected
Direction of	Assessment:		☐ Upstr		ownstream		☐ Sample 3	to downstream network
low Influe	ence	☐ Fr	eshet (1)		Spate (2)		☐ Baseflo	ow (3)
low Cond	lition	□ Dr	y (1) anding Water (2)		☐ Interstitial Flo		☐ Substa	ntial Flow (5)
eature Ty	pe	☐ De	efined Natural Chan nannelized or Const ulti-thread (3)	7 1 1	☐ No Defined For Tiled Feature ☐ Wetland (6)	Feature (4)	Swale Roadsi Pond (	de Ditch (8)
Feature Ve	getation		)	☐ Cropped (3)		☐ Scrubland (5		Forest (7)
Waster III				The state of				
Riparian Vi 3 - 1.5 m	Left Bank Right Bank	□None (1) □ None (1		□Cropped (3)	☐Meadow (4) ☐ Meadow (4)	☐ Scrubland (5) ☐ Scrubland (5)	Wetland (6) Wetland (6)	☐ Forest (7) ☐ Forest (7)
i.5 - 10 m	Left Bank Right Bank	☐ None (1☐ None (1☐		☐ Cropped (3) ☐ Cropped (3)	☐ Meadow (4) ☐ Meadow (4)		A CONTRACTOR OF THE PARTY OF TH	
0 - 30 m	Left Bank Right Bank	☐ None (1 ☐ None (1		☐ Cropped (3) ☐ Cropped (3)		☐ Scrubland (5	The second secon	
	radient (S4.M	// WVisi	ual (1) Clinome		r Level (3) Sur		Other (5) Gradient (%	☐ LiDAR (6)
Distance (m	n): Substrate (S.	CI.	ual (1) Clinome	Elevation (cm) Silt Sand (0.06		_ /	Gradient (%	i): lar.
Distance (m Dominant S Sub-Domir	Substrate (Si	CI. 2.M3) te (S2.M3)	ay (Hard Pan)	Elevation (cm) Silt Sand (0.06	3-2 mm) Gravel (2	22-66 mm) Cobbl	Gradient (%	older (250 mm) Bedrock
Distance (m  Dominant s  Sub-Domir  Feature Ro	Substrate (S.	CI. 2.M3) te (S2.M3)	ay (Hard Pan)  C  C  C  C  C  C  C  C  C  C  C  C  C	Elevation (cm)  Silt Sand (0.06	3-2 mm) Gravel (2	22-66 mm) Cobbl	Gradient (%	o): \( \left( 250 mm \) \( \text{Bedrock} \) \( \text{Bedrock} \) \( \text{D} \)
Distance (m Dominant Sub-Domin Feature Ro Vidth Meas Channel Di	Substrate (Sinant Substrate (Sinant Substrate	CI.  2.M3)  te (S2.M3)  Can't Ma	ay (Hard Pan)	Elevation (cm)  Silt Sand (0.06	Gravel (2)  Mean Width (3)  Bankfull	22-66 mm) Cobbl 22-66 mm) Cobbl 22-66 mm) Cobbl 22-66 mm) Estimated (4	Gradient (%  le (67-249 mm) Bou  li	older (250 mm) Bedrock  Owner Control  Owner Contro
Distance (m Dominant S Sub-Domin Feature Ro Vidth Meas Channel Di	Substrate (Sanant Substrate (S	CI.  2.M3)  te (S2.M3)  Can't Ma  Feature Width  atal: > 4	ay (Hard Pan)	Elevation (cm)  Silt Sand (0.06	Gravel (2)  Mean Width (3)  Bankfull  m Righ	22-66 mm) Cobbl  22-66 mm) Cobbl  40 - 60% Hig  Estimated (4)  Depth (mm)	Gradient (%  le (67-249 mm) Bou  gh (3)	older (250 mm) Bedrock  Owner
Distance (m Dominant s Sub-Domin Feature Ro Width Meas Channel Di Entrenchm	Substrate (Sinant Substrate (Sinant Substrate	CI.  2.M3)  te (S2.M3)  Can't Me  Feature Widt  Ital: > 2	ay (Hard Pan)  C	Elevation (cm)  Silt Sand (0.06	Gravel (2)  Gravel (2)  Mean Width (3)  Bankfull  m Righthead (2)	22-66 mm) Cobbl  40 - 60% Hig Estimated (4)  Depth (mm)  at Bank  Distance by Time	Gradient (%  le (67-249 mm) Bou  gh (3)	older (250 mm) Bedrock  Owner Control  Owner Contro
Distance (m Dominant s Sub-Domin Feature Ro Vidth Meas Channel Di Entrenchm	Substrate (S. nant Substrate (S.	CI.  2.M3)  te (S2.M3)  Can't Ma  Feature Width  atal:  Perched  Wetted  1	ay (Hard Pan)	Elevation (cm)  Silt Sand (0.06  1) 10 - 40  Bankfull (2) 5  m Left Bank	3-2 mm) Gravel (2) 3% Moderate (2) 4 Mean Width (3) 5 Bankfull 6 m Righ	22-66 mm) Cobbl  22-66 mm) Cobbl  40 - 60% Hig  Estimated (4  Depth (mm)  It Bank  Distance by Time	Gradient (%  de (67-249 mm) Bou  gh (3)	older (250 mm) Bedrock  older
Distance (m Dominant s Sub-Domin Feature Ro Width Meas Channel Di Entrenchm Surface Flo Wetted	Substrate (S. nant Substrate (S.	CI.  2.M3)  te (S2.M3)  Can't Ma  Feature Width  atal:  Perched  Wetted  1	ay (Hard Pan)	Elevation (cm)  Silt Sand (0.06  1) 10 - 40  Bankfull (2) 5  m Left Bank Hydraulic head (mr. 1 2)	Gravel (2)  Mean Width (3)  Bankfull  m Righ  Head (2)  Volume	22-66 mm) Cobbl  40 - 60% High Estimated (4)  Depth (mm) It Bank Distance by Time  (4)  2 3  (3) G  (4)  (3) G  (4)  (4)  (5)	Gradient (%  le (67-249 mm) Bou  gh (3)	older (250 mm) Bedrock  older (250 mm) Bedrock  older (250 mm) Bedrock  older (4)  Measure/GIS (6)  fidthm  Estimated (4)  Time (s)  1 2 3  tlet Scour (5)  ner (8)  tlet Scour (5)

Marine - Administra	11 1	and the size of materials of	Uncons	strained H	leadwater Di	rainage Fe	eature Assessm		Pg. 2 of 2
Date.	Marce!		14 _ \Cou		Field			Sample # 2	Sample # 3
		to the state of th		PC	DINT FEAT	TURE DA	TA		
Ground	mier Measurer  we down  water Indicate  official in	ors UP#	None W	Perched Heig Perched Heig Watercress Present		Jumpin Bubblin	g Height (mm): g Height (mm): g Stained		
WP#	Photo #	Code	Category				Description		
				Cor	- per lod 1	pc 0	WCD-WCD-	AC.	
				Para	Alel + +d	alical	to SMI	A-2-C	Δ.
Addit	ional Notes	s: 							
Site B	reak	Feature Type	e	ure Modifier	Flow	Conditions	☐ Feature Vege	etation	ian Vegetation
Trigge	er 🗔	Other: Com	nments	/_		,	_		
Point Categ			Ongoing and A	' '		ric Evidence ( own (5)	2) Reported but	No Evidence (3)	
-	DATA KEY:			<u>'</u>		1-7	-		
A B C D E F G H	Spring/upwel Seepage are: Watercress - Outlet (tile or Inlet (tile or o Beaver dam - Manmade da Other barrier	a - measure or estimate total s other) - record ther) - record fl measure perc m - measure per to fish movement	ow status as per hed height and ju erched height an ent	of bank where upied er feature flow. feature flow. Europing height d jumping height d jumping heig	seepage occurs  Estimate volume to ght	be <0.5 l/sec	0.5 l/sec. Measure ten or >0.5 l/sec.	nperature,	
I J K L M N O P Q R S	Channel hard Culvert - note Flow transitio Flow transitio Flow transitio	ening - indicate type, size and n point D/S - flo n point M/S- flo n point D-S/IF- d during non-fis ent source	ed by rip-rap, arm whether or not p ow condition char ow condition char	nour stone, or perched. If peronges from dry nges from mini panges from d	ched record perch to standing water, imal to substantial	ed height and independent of surface flow, i	jumping height. of segment break ndependent of segmer ow, independent of seg		

	Unconstrained Headwater	Drainage Feature Assessment
Date May 6 Stream Name: 5 Site Limits:  Direction of Assessment:	MD - WC2 - Stream Code: Spin H Upstream 16T WP# 452718E 508 Downstream WP# W52245E 50	MD Cu3ite Code: 5MO - WCJ - B  5/8QU Field Assessment: Sample 1 Unconnected HDF:  CSD5EU. □ Sample 2 □ Not connected
Flow Influence	☐ Upstream ☐ Do	wnstream
Flow Condition	Dry (1) Standing Water (2)	☐ Interstitial Flow (3) ☐ Substantial Flow (5) ☐ Minimal Flow (4)
Feature Type	Defined Natural Channel (1) Channelized or Constrained (2) Multi-thread (3)	□ No Defined Feature (4) □ Swale (7) □ Tiled Feature (5) □ Roadside Ditch (8) □ Wetland (6) □ Pond (9)
Feature Vegetation	☐ None (1) ☐ Lawn (2) ☐ Cropped (3)	☐ Meadow (4) ☐ Scrubland (5) ☐ Wetland(6) ☐ Forest (7)
Riparian Vegetation 0 - 1.5 m Left Bank Right Bank		□ Meadow (4) □ Scrubland (5) □ Wetland (6) □ Forest (7) □ Meadow (4) ☑ Scrubland (5) □ Wetland (6) □ Forest (7)
1.5 - 10 m Left Bank Right Bank	None (1) ☐ Lawn (2) ☐ Cropped (3) ☐ None (1) ☐ Lawn (2) ☐ Cropped (3)	☐ Meadow (4) ☐ Scrubland (5) ☐ Wetland (6) ☐ Forest (7) ☐ Meadow (4) 描 Scrubland (5) ☐ Wetland (6) ☐ Forest (7)
10 - 30 m Left Bank Right Bank	None (1) ☐ Lawn (2) ☐ Cropped (3) ☐ None (1) ☐ Lawn (2) ☐ Cropped (3)	☐ Meadow (4) ☐ Scrubland (5) ☐ Wetland (6) ☐ Forest (7) ☐ Meadow (4) ☐ Scrubland (5) ☐ Wetland (6) ☑ Forest (7)
Dominant Substrate (S Sub-Dominant Substra	2.M3)	6-2 mm) Gravel (22-66 mm) Cobble (67-249 mm) Boulder (250 mm) Bedrock
Feäture Roughness Width Measurement	☐ Can't Measure (1) ☐ Bankfull (2) ☐	9% Moderate (2)
Channel Dimensions		Bankfull Depth (mm) 3 0 0
Surface Flow Method	Perched Culvert (1) Hydraulic H	
Wetted Width (m)	Wetted Depth (mm) Hydraulic head (mm	n) Volume (L) Distance (m) Time (s)
Sediment Transport	Adjacent : None (1) Rill (2)  Sheet Erosion (6)  Feature None (1) Rill (2)  Sheet Erosion (6)	☐ Rill and Gully (3) ☐ Gully (4) ☐ Outlet Scour (5) ☐ Instream Bank Erosion (7) ☐ Other (8) ☐ Rill and Gully (3) ☐ Gully (4) ☐ Outlet Scour (5) ☐ Instream Bank Erosion (7) ☐ Other (8)
	Minimal: < 5 mm (2)	(3) Substantial: 31-80 mm (4) Extensive: > 80 mm (5)

10 1 N	Les col nor	N		strained Headwater Drainage Feature Assessment Pg. 2 of 2  Field Assessment: Sample # 1 Sample # 2 Sample # 3
-	112/20		-,12/32	POINT FEATURE DATA
Ground	rrier Measuren water Indicate	WP#	None	Perched Height (mm):  Perched Height (mm):  Jumping Height (mm):
WP#	Photo#	Code	Category	Description
				Carech to both
				5NO-WOA
				SMP-VCD-AA T 900
				SMD-WD-AC. collare
Site B	r 🗆	Feature Typ	nments	ture Modifier
Point I			Ongoing and	이 선거들에서 하는 사람들은 그들은 그들은 이렇게 되었다면 하다면 하면 되었다면 되었다면 되었다.
Catego	DATA KEY:		No Evidence	(4) Unknown (5)
V C	Seepage area Watercress - Outlet (tile or Inlet (tile or ot Beaver dam - Manmade dan Other barrier Potential cont Channel hardi Culvert - note Flow transition	a - measure or estimate total other) - record fineasure percon - measure percon - measure profish movem amination south ening - indicatilype, size and point D/S - fin point M/S-fill during non-firent source	estimate length surface area occ I flow status as pe low status as pe ched height and perched height are ent orce (storm sewe ed by rip-rap, are d whether or not ow condition cha	er feature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature.  releature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec.  umping height  routlet or industrial discharge pipe).  mour stone, or gabion baskets.  perched. If perched record perched height and jumping height.  anges from dry to standing water, independent of segment break  nges from dry/standing water to interstitial flow, independent of segment break  hanges from dry/standing water to interstitial flow, independent of segment break
2	Dredging of cl			
	Offline pond			
	Other			

	Unconstrained Headwat	er Drainage Feature Assess	ment
	, 2021 Project#: You'd		Marsell B. Oceancyst.
Stream Name. 5 m.	D-WCZ-C Stream Code: 50 Upstream 187 WP# 450087E Downstream WP# 450078E	505153 PField Assessment:	Sample 1 Unconnected HDF: Sample 2  Not connected
Direction of Assessment:			Sample 3 to downstream network
Flow Influence	☐ Freshet (1)	Spate (2)	☐ Baseflow (3)
Flow Condition	Dry (1)  Standing Water (2)	☐ Interstitial Flow (3) ☐ Minimal Flow (4)	☐ Substantial Flow (5)
Feature Type	Defined Natural Channel (1) Channelized or Constrained (2) Multi-thread (3)	☐ No Defined Feature (4) ☐ Tiled Feature (5) ☐ Wetland (6)	Swale (7)  Roadside Ditch (8)  Pond (9)
Feature Vegetation	☐ None (1) ☐ Lawn (2) ☐ Cropped (3)		☐ Wetland(6) ☐ Forest (7)
Riparian Vegetation 0 - 1.5 m Left Bank Right Bank	□ None (1) □ Lawn (2) □ Cropped (3) □ None (1) □ Lawn (2) □ Cropped (3)	Meadow (4) Scrubland (5) Meadow (4) Scrubland (5)	☐Wetland (6) ☐Forest (7) ☐ Wetland (6) ☐ Forest (7)
1.5 - 10 m Left Bank Right Bank	□ None (1)         □ Lawn (2)         □ Cropped (3)           □ None (1)         □ Lawn (2)         □ Cropped (3)		☐ Wetland (6) ☐ Forest (7) ☐ Wetland (6) ☐ Forest (7)
10 - 30 m Left Bank Right Bank	M None (1) ☐ Lawn (2) ☐ Cropped (3) ☐ None (1) ☐ Lawn (2) ☐ Cropped (3)		☐ Wetland (6) ☐ Forest (7) ☐ Wetland (6) ☐ Forest (7)
Channel Gradient (S4.N	17) Wisual (1) Clinometer (2) La	ser Level (3) Survey Level (4)	Other (5) LiDAR (6)
Distance (m): PA			Gradient (%):
Sub-Dominant Substrat	e (S2.M3)		
Feature Roughness Width Measurement	Can't Measure (1) Bankfull (2)	- 40% Moderate (2)	
Channel Dimensions	Feature Width (m):	7	NA
Entrenchment "To	tal: 40 m C < 40 m Left Bank	m Right Bank	_m Total widthm
Surface Flow Method	Perched Culvert (1)	lic Head (2) Distance by Time (3	Estimated (4)
Wetted Width (m)	Wetted Depth (mm) Hydraulic head (		Distance (m) Time (s)  1 2 3 1 2 3  1 2 3
Endomini Transucci	Adjacent None (1) Rill (2)  Sheet Erosion (6)  None (1) Rill (2)  Sheet Erosion (6)	☐ Rill and Gully (3) ☐ Gul ☐ Instream Bank Erosion (7) ☐ Rill and Gully (3) ☐ Gul ☐ Instream Bank Erosion (7)	Other (8)
Sediment Deposition	Measures (mm):	/ /	/ /
	Minimal: < 5 mm (2)	nm (3) Substantial: 31-80 mm (4)	Extensive: > 80 mm (5)

-	reserved in their	*		Field Assessment: Sample #1 Sample #2 Sample #3						
		(Virgo								
HISH BIN	mer Measurer	ments WP#		Perched Height (mm):  Perched Height (mm):  Jumping Height (mm):						
Date in t	enancia de altre di			Watercress ☐ Seepage ☐ Bubbling ☐ Stained ☐ Other:						
Groundwater Indicators None Watercress Seepage Bubbling Stained Other:  Fish Collection Present Comment:										
1311 60	inection.	-	Muserii L	Present Comment						
WP#	Photo #	Code	Category	Description						
				+ SMO-WCD-BS FOR SLOVELED						
				L NO COLEGE.						
		,								
			1							
	0.00									
Addit	onal Notes	s: \	~	TUPT ROW Managed for vegetation						
Site Bi	reak 🔯	Feature Typ	e							
	reak 🔯		e	record Conditions   Feature Vegetation   Riparian Vegetation						
Site Bi Trigge Point I	reak 🔯 r 🗆	Feature Typ	e	ture Modifier						
Site Br Trigge Point I Catego	reak 🔯 r 🗆	Feature Typ	e	ture Modifier						

Date: May ST	10021	Proje	ct#: 160410	1805	Recorder/Crew:	J. March	1
Stream Name:			m Code:		Site Code:	SMD-U	
Site Limits:	Upstream Downstream	WP# WP#			Field Assessme		Unconnected HDF:
Direction of Assessment:		☐ Upstr	eam 🔲 [	Downstream		☐ Sample 3	to downstream network
low influence	☐ Freshet	(1)		☐ Spat	e (2)	■ Ва	seflow (3)
Flow Condition	Dry (1)  Standin				stitial Flow (3) nal Flow (4)	□ Su	bstantial Flow (5)
Feature Type	☐ Defined	d Natural Chan elized or Const		□ No D	refined Feature (4) Feature (5)	☐ Sw ☐ Ro ☐ Po	adside Ditch (8)
Riparian Vegetation	□ None (1) □		Cropped (3)		fow (4) Grub		d(6)
0 - 1.5 m Left Bank Right Bank	□None(1) □ □ None (1) □	Lawn (2) Lawn (2)	□Cropped (3) □ Cropped (3)	□ Meadov	and the second second	The state of the s	
1.5 - 10 m Left Bank Right Bank	the state of the s	☐ Lawn (2) ☐ Lawn (8)	Cropped (3)		dow (4) Scrub dow (4) Scrub	AND THE RESERVE TO SERVE THE PARTY OF THE PA	
10 - 30 m Left Bank Right Bank	the state of the s	☐ Lawn (2) ☐ Lawn (2)	Cropped (3)	☐ Mea	dow (4) Scrub dow (4) Scrub		
Distance (m):	-		_ Elevation (cm	11:0		Gradie	nt (%):
Dominant Substrate (S2	2.M3) [	Hard Pan)	Silt Sand (0.0	1	Gravel (22-66 mm)		nt (%):  Boulder (250 mm) Bedrock
Dominant Substrate (S2 Sub-Dominant Substrat Feature Roughness Width Measurement	2.M3) [ e (S2.M3) [	10% Minimal (	Silt Sand (0.0	06-2 mm)  40% Moderate  Mean Wi	2(2) 40 6	Cobble (67-249 mm)  Graph (3)  Graph (3)  Graph (4)  Graph (5)	
Distance (m):  Dominant Substrate (SZ Sub-Dominant Substrat Feature Roughness Width Measurement Channel Dimensions Entrenchment To	2.M3) [ ce (\$2.M3) [ Can't Measure  Feature Width (m)	10% Minimal ( re (1)	Silt Sand (0.0	06-2 mm)  40% Moderate  Mean Wi	2 (2) 40 6 dth (3) Estim	Cobble (67-249 mm)	Boulder (250 mm) Bedrock
Dominant Substrate (S2 Sub-Dominant Substrat Feature Roughness Width Measurement Channel Dimensions	2.M3) [ ce (\$2.M3) [ Can't Measure  Feature Width (m)	10% Minimal ( re (1)	Silt Sand (0.0	06-2 mm)  40% Moderate  Mean Wi	e (2) 40 ddth (3) Estim	Cobble (67-249 mm)	Boulder (250 mm) Bedrock

				Field Assessment: Sample # 1 Sample # 2 Sample # 3						
				POINT FEATURE DATA						
Fish Ba	rrier Measuren			Perched Height (mm): Jumping Height (mm):						
		WP#		Perched Height (mm): Jumping Height (mm):						
Ground	water Indicate	ors $\square$	None $\Box$	Watercress Seepage Bubbling Stained Other:						
ish Co	llection		Absent	Present Comment:						
WP#	Photo #	Code Category		Description						
			-							
			1							
Site B	_	Feature Typ		ature Modifier						
Point		Other. Our	Ongoing and	Active (1) Historic Evidence (2) Reported but No Evidence (3)						
Categ				(4) Unknown (5)						
	DATA KEY:		110 0 1111111111	4.9						
A B C D E F G H I J K L	Seepage area Watercress - Outlet (tile or Inlet (tile or of Beaver dam - Manmade dar Other barrier Potential cont Channel hard Culvert - note Flow transition	a - measure or estimate total other) - record her) - record f measure per n - measure p to fish movem amination sou ening - indicat type, size and n point D/S - fl n point M/S- fi	r estimate length surface area oc d flow status as pe ched height and perched height a dent urce (storm sewe ted by rip-rap, and d whether or not low condition che	per feature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature. er feature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec.						

	1000/1	Proje	COLLIC	1925	Recorder/Crew:	3 Marsell		
Stream Name:			im Code:		Site Code:		SMD-wc1-A	
Site Limits:	Upstream Downstream	WP#		Field Assessment:		☐ Sample 1 ☐ Sample 2	Unconnected HDF:	
Direction of Assessment		Upst	ream $\square$ D	ownstream		☐ Sample 3	to downstream networ	
Flow Influence	☐ Freshet	(1)		☐ Spate (2)		Base	flow (3)	
Flow Condition	Dry (1)  Standin			☐ Interstitia☐ Minimal F		☐ Subs	tantial Flow (5)	
Feature Type		Natural Chan			ed Feature (4)	☐ Swale	≥ (7)	
		lized or Const	rained (2)	☐ Tiled Fea			side Ditch (8)	
Feature Vegetation	☐ Multi-the		☐ Cropped (3)	☐ Wetland		☐ Pond		
1	- Mone (1)	Lawii (2)	Li Cropped (3)	⊔ Meadow	(4) Scrubland	d (5) Wetland(6	6) D Forest (7)	
Riparian Vegetation	-	Service .	Tarren and a co					
0 - 1.5 m Left Bank Right Bank		Lawn (2)  Lawn (2)	☐ Cropped (3) ☐ Cropped (3)	☐ Meadow (4) ☐ Meadow	☐Scrubland (5)			
1.5 - 10 m Left Bank Right Bank	☐ None (1) ☐ None (1) ☐		☐ Cropped (3)		(4) Scrubland (4) Scrubland	Carlotte Committee Committ	The state of the s	
10 - 30 m Left Bank Right Bank	☐ None (1) ☐ None (1) ☐	] Lawn (2)	☐ Cropped (3)☐ Cropped (3)		(4) Scrubland			
Distance (m):	-		_ Elevation (cm)	-		Gradient (	%):	
Dominant Substrate (S	2.M3)	ard Pan)	Silt Sand (0.06	Symm) Grave	el (22-66 mm) Col		%): oulder (250 mm) Bedrock	
Dominant Substrate (S Sub-Dominant Substra	2.M3) te (S2.M3)	1	Silt Sand (0.06	Grave		bble (67-249 mm) Bo		
Dominant Substrate (S Sub-Dominant Substra Feature Roughness	2.M3) te (S2.M3)	10% Minimal (	Silt Sand (0.06	Symm) Grave	40 - 60%	bble (67-249 mm) Bo	pulder (250 mm) Bedrock	
Dominant Substrate (S Sub-Dominant Substra Feature Roughness Vidth Measurement	2.M3) C	10% Minimal (	Silt Sand (0.06	352 mm) Grave  0	40 - 60%	bble (67-249 mm) Bo	pulder (250 mm) Bedrock	
Dominant Substrate (S Sub-Dominant Substra eature Roughness Vidth Measurement Channel Dimensions	te (S2.M3)	10% Minimal (	Silt Sand (0.06	352 mm) Grave  0% Moderate (2)  1 Mean Width (3)	40 - 60% 3) Estimated	bble (67-249 mm) Bo	oulder (250 mm) Bedrock  Graph Graph  60% Extreme (4)  Measure/GIS (6)	
Dominant Substrate (S Sub-Dominant Substra Feature Roughness Vidth Measurement Channel Dimensions	te (S2.M3)  Can't Measure  Feature Width (m):  tal: > 40 m	10% Minimal ( e (1)	Silt Sand (0.06	O% Moderate (2)  Mean Width (3)  Bankf	40 - 60% 3) Estimated ull Depth (mm)	bble (67-249 mm) Bo	oulder (250 mm) Bedrock  Graph Graph  60% Extreme (4)  Measure/GIS (6)	
Dominant Substrate (S Sub-Dominant Substra Feature Roughness Nidth Measurement Channel Dimensions Entrenchment To Surface Flow Method	te (S2.M3)  Can't Measure  Feature Width (m):  tal:  > 40 m  Perched Culve	10% Minimal (e (1)	Silt Sand (0.06	O% Moderate (2)  Mean Width (3)  Banki  m R  Head (2)	3) Sestimated ull Depth (mm) ight Bank Distance by Tir	bble (67-249 mm) Bo	oulder (250 mm) Bedrock  Graph Graph  60% Extreme (4)  Measure/GIS (6)  widthm  Estimated (4)	
Distance (m):  Dominant Substrate (S Sub-Dominant Substra  Feature Roughness  Nidth Measurement  Channel Dimensions Entrenchment  To Surface Flow Method  Wetted Width (m)	te (S2.M3)  Can't Measure  Feature Width (m):  tal: > 40 m	10% Minimal (e (1)	Silt Sand (0.06	O% Moderate (2)  Mean Width (3)  Banki  m R  Head (2)	40 - 60% 3) Estimated ull Depth (mm)	bble (67-249 mm) Bo	oulder (250 mm) Bedrock  Graph Graph  60% Extreme (4)  Measure/GIS (6)	
Dominant Substrate (S Sub-Dominant Substra Feature Roughness Vidth Measurement Channel Dimensions Intrenchment To urface Flow Method Wetted Width (m)	z.M3)  te (S2.M3)  Can't Measure  Feature Width (m):  tal:	10% Minimal ( e (1)	Silt Sand (0.06	O% Moderate (2)  Mean Width (3)  Banki  m R  Head (2)	3) Estimated  Juli Depth (mm)  ight Bank  Distance by Tin  me (L)  2  3	bble (67-249 mm) Bo	pulder (250 mm) Bedrock  Gow Extreme (4)  Measure/GIS (6)  widthm  Estimated (4)  Time (s)	

ier Measurer later Indicate ection  Photo #	Code		Perched Heig Perched Heig Watercress Present	ht (mm):  Seepage Comment:	Jumping	Height (mm): Height (mm):		lher:	
Photo #	Code	None Absent   Category	Perched Heig Perched Heig Watercress Present	ht (mm):  th (mm):  Seepage Comment:	Jumping Jumping	Height (mm): Height (mm): Stained		ther:	
			48° 000			Description			
nal Notes	: + N	6W0	100 de de						
nal Notes	: + N	6W0	100 do						
nal Notes	: + N	6 W6	100 do						
nal Notes	: + N	6 W 6	100 000						
nal Notes	· 4 N	6 We	rer do						
ak 🛚	Feature Typ		ature Modifier		Conditions	☐ Feature Veg	etation	Ripar	rian Vegetation
ata 🗆	Other: Con	nments	Active (1)	Histori	c Evidence (2)	) Reported bu	it No Evic	dence (3)	
У			3 16		The state of the s	77470		3000	
eepage area Vatercress - of Jutlet (tile or of eaver dam - danmade dar other barrier to otential contribation of hannel harde ulvert - note low transition low transition	a - measure or estimate total solher) - record filmeasure percon - measure percon - measure percon in the movement of ish movement of indicate type, size and a point D/S - flor point D/S-/IF-during non-fisent source	estimate length surface area occ flow status as prow status as perched height and erched height are entered by rip-rap, are whether or not ow condition characteristics.	of bank where cupied per feature flow. In feature flow. In feature flow is jumping height and jumping height are outlet or indust amour stone, or perched. If perchanges from dry anges from dry anges from dry anges from dry dry anges from dry dry anges from dry dry anges from dry	Estimate volume to the strial discharge pip gabion baskets. The discharge process to standing water, mal to substantial	be <0.5 l/sec or e). ed height and jurindependent of surface flow, inc	r>0.5 l/sec.  mping height, segment break dependent of segme	ent break		X
A FEVUILLE MAN	oring/upwell epage area attercress - utilet (tile or ot eaver dam - anmade dar her barrier I otential contiannel hard ulvert - note ow transitior	pring/upwelling - estimate repage area - measure or atercress - estimate total of the control of	pring/upwelling - estimate <0.5 l/sec or >0 sepage area - measure or estimate length atercress - estimate total surface area ocutlet (tile or other) - record flow status as pet (tile or other) - record flow status as pet aver dam - measure perched height and anmade dam - measure perched height and aher barrier to fish movement atertal contamination source (storm sewer lannel hardening - indicated by rip-rap, and the status are perched height and the status of	pring/upwelling - estimate <0.5 l/sec or >0.5 l/sec; measure sepage area - measure or estimate length of bank where atercress - estimate total surface area occupied utlet (tile or other) - record flow status as per feature flow. Et (tile or other) - record flow status as per feature flow. Et (tile or other) - record flow status as per feature flow. Et eaver dam - measure perched height and jumping height and amade dam - measure perched height and jumping height and partier to fish movement estential contamination source (storm sewer outlet or industration hardening - indicated by rip-rap, armour stone, or solvert - note type, size and whether or not perched. If percondition point D/S - flow condition changes from dry the transition point D/S - flow condition changes from dry the transition point D-S/IF- flow condition changes from dry the observed during non-fish sampling activities tential nutrient source adging of channel line pond	pring/upwelling - estimate <0.5 l/sec or >0.5 l/sec; measure temp sepage area - measure or estimate length of bank where seepage occurs atercress - estimate total surface area occupied utlet (tile or other) - record flow status as per feature flow. Estimate volume of the or other) - record flow status as per feature flow. Estimate volume to eaver dam - measure perched height and jumping height sammade dam - measure perched height and jumping height her barrier to fish movement estential contamination source (storm sewer outlet or industrial discharge pipulannel hardening - indicated by rip-rap, armour stone, or gabion baskets. elivert - note type, size and whether or not perched. If perched record perche ow transition point D/S - flow condition changes from dry to standing water, ow transition point M/S- flow condition changes from minimal to substantial so the observed during non-fish sampling activities tential nutrient source	pring/upwelling - estimate <0.5 l/sec or >0.5 l/sec; measure temp sepage area - measure or estimate length of bank where seepage occurs atercress - estimate total surface area occupied utlet (tile or other) - record flow status as per feature flow. Estimate volume <0.5 l/sec or >0 et (tile or other) - record flow status as per feature flow. Estimate volume to be <0.5 l/sec or eaver dam - measure perched height and jumping height and amade dam - measure perched height and jumping height her barrier to fish movement estential contamination source (storm sewer outlet or industrial discharge pipe). Intential contamination source (storm sewer outlet or industrial discharge pipe). Intential contamination source (storm sewer outlet or industrial discharge pipe). Intential contamination point by rip-rap, armour stone, or gabion baskets. Industrial hardening - indicated by rip-rap, armour stone, or gabion baskets. Industrial hardening - indicated by rip-rap, armour stone, or gabion baskets. Industrial hardening - indicated by rip-rap, armour stone, or gabion baskets. Industrial hardening - indicated by rip-rap, armour stone, or gabion baskets. Industrial hardening - indicated by rip-rap, armour stone, or gabion baskets. Industrial hardening - indicated by rip-rap, armour stone, or gabion baskets. Industrial hardening - indicated by rip-rap, armour stone, or gabion baskets. Industrial hardening - indicated by rip-rap, armour stone, or gabion baskets. Industrial discharge pipe).	pring/upwelling - estimate <0.5 l/sec or >0.5 l/sec; measure temp sepage area - measure or estimate length of bank where seepage occurs aftercress - estimate total surface area occupied utilet (title or other) - record flow status as per feature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure te et (title or other) - record flow status as per feature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec. sever dam - measure perched height and jumping height her barrier to fish movement there is a movement of the fish move	pring/upwelling - estimate <0.5 l/sec or >0.5 l/sec; measure temp sepage area - measure or estimate length of bank where seepage occurs aftercress - estimate total surface area occupied utlet (tile or other) - record flow status as per feature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature et (tile or other) - record flow status as per feature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec. seaver dam - measure perched height and jumping height her barrier to fish movement the barrier to fish movement of sewer outlet or industrial discharge pipe). It is annual hardening - indicated by rip-rap, armour stone, or gabion baskets. Indicated by rip-rap, armour stone, or gabion baskets. Indicated by rip-rap, armour stone, or standing water, independent of segment break ow transition point D/S - flow condition changes from dry to standing water, independent of segment break ow transition point M/S- flow condition changes from minimal to substantial surface flow, independent of segment break of the observed during non-fish sampling activities tential nutrient source adging of channel line pond	Aring/upwelling - estimate < 0.5 l/sec or > 0.5 l/sec; measure temp sepage area - measure or estimate length of bank where seepage occurs altercress - estimate total surface area occupied utlet (tile or other) - record flow status as per feature flow. Estimate volume < 0.5 l/sec or > 0.5 l/sec. Measure temperature. et (tile or other) - record flow status as per feature flow. Estimate volume to be < 0.5 l/sec or > 0.5 l/sec. saver dam - measure perched height and jumping height sammade dam - measure perched height and jumping height her barrier to fish movement stential contamination source (storm sewer outlet or industrial discharge pipe). sannel hardening - indicated by rip-rap, armour stone, or gabion baskets. solvert - note type, size and whether or not perched. If perched record perched height and jumping height, sow transition point D/S - flow condition changes from dry to standing water, independent of segment break sow transition point M/S- flow condition changes from minimal to substantial surface flow, independent of segment break why transition point D-S/IF- flow condition changes from dry/standing water to interstitial flow, independent of segment break the observed during non-fish sampling activities tential nutrient source adging of channel line pond

Date: May 2	1202/	Projec	# \CO410	325 Re	ecorder/Crew		
Stream Name:			m Code:		te Code:	SMD-WC	1-8
Site Limits:	Upstream Downstream	WP#		Fi	eld Assessment:	☐ Sample 1 ☐ Sample 2	Unconnected HDF:
Direction of Assessment:		Upstr	eam 🔲 D	ownstream		☐ Sample 3	to downstream netwo
Flow Influence	☐ Freshe	et (1)		☐ Spate (2)		Base	flow (3)
Flow Condition	Ory (1)	ng Water (2)		☐ Interstitial☐ Minimal FI		☐ Subs	tantial Flow (5)
Feature Type	☐ Define	d Natural Chan elized or Const bread (3)			d Feature (4) ure (5)	Swale Road	Iside Ditch (8)
Feature Vegetation	☐ None (1)		Cropped (3)		4) Scrublan		6)
0 - 1.5 m Left Bank Right Bank		□ Lawn (2) □ Lawn (2)	□Cropped (3)	☐Meadow (4) ☐ Meadow (4)	Scrubland (		the second second to the second second
1.5 - 10 m Left Bank Right Bank	☐ None (1) ☐ None (1)	Lawn (2)	☐ Cropped (3) ☐ Cropped (3)	☐ Meadow (	4) Scrublan 4) Scrublan		
10 - 30 m Left Bank Right Bank		☐ Lawn (2)	Cropped (3) Cropped (3)		4) Scrublan 4) Scrublan		
Channel Gradient (S4.) Distance (m):	- Visual	1) Clinome	Elevation (cm	Ų— -	Survey Level (4)	Other (5) Gradient	LiDAR (6)
Distance (m):  Dominant Substrate (S	— Clay (	Hard Pan)	Elevation (cm	Ų— -			(%): Boulder (250 mm) Bedroc
Distance (m):  Dominant Substrate (S Sub-Dominant Substra	Clay ( 2.M3) te (S2.M3)	Hard Pan)  C  C  C  C  Minimal	Elevation (con	16-2 mm) Grave	(22-66 mm) Co	Gradient  obble (67-249 mm) E	(%).
Distance (m):  Dominant Substrate (S Sub-Dominant S Substrate (S Subst	Clay ( 2.M3)  te (S2.M3)  Can't Meas  Feature Width (n	Hard Pan)  Control  C	Silt Sand (0.0	Grave Grave Grave Moderate (2) Mean Width (3	(22-66 mm)   Co	Gradient  obble (67-249 mm) E  High (3)	Soulder (250 mm) Bedroc  Boulder (250 mm) Bedroc  Graph Bedroc  Graph Bedroc  Measure/GIS (6)
Distance (m):  Dominant Substrate (S Sub-Dominant Substrate (S Substra	Clay ( 2.M3)  te (S2.M3)  Can't Meas  Feature Width (notal: > 40 notal: > 40 notal: Wetted Dep	Hard Pan)  < 10% Minimal  ure (1)     10	Silt Sand (0.0	Grave	Il (22-66 mm) Co	Gradient  Obble (67-249 mm) B  High (3)	Soulder (250 mm) Bedroc  Government Governme
Distance (m):  Dominant Substrate (S Sub-Dominant Substrate (S Sub-Dominant Substrate (S Sub-Dominant Substrate (S Sub-Dominant Substrate (S Surface Flow Method)	Clay ( 2.M3)  te (S2.M3)  Can't Meas  Feature Width (notal: > 40 notal)	Hard Pan)  < 10% Minimal pure (1)	Silt Sand (0.0	Grave	2 (22-66 mm) Co	Gradient  Obble (67-249 mm) B  High (3)	Soulder (250 mm) Bedroc  Soulder (250 mm) Bedroc  Soulder (250 mm) Bedroc  Measure (4)  Measure/GIS (6)  I widthm  Estimated (4)  Time (s)

Date:		Proje	Uncons				ure Assessme	ent Sample # 2	Pg. 2 of 2
					INT FEATU	RE DATA	A		
Ground	rrier Measuren water Indicate	wP#	None	Perched Height Perched Height Watercress Present	(mm): (mm)	Jumping He Jumping He	eight (mm): eight (mm):	Other:	
WP#	Photo #	Code	Category			- 12 74	Description		
Addit		* 1	ydric s	Joseph H	Flow Co		☐ Feature Vegeta		ian Vegetation
Point Categ	Data		Ongoing and A No Evidence (			Evidence (2) n (5)	Reported but N	lo Evidence (3)	
POINT ABCDEFGHLJKLMNO	Seepage area Watercress - Outlet (tile or Inlet (tile or of Beaver dam - Manmade dar Other barrier Potential cont Channel hard Culvert - note Flow transition	a - measure or estimate total other) - record ther) - record measure per m - measure per to fish movem amination sou ening - indical type, size and n point D/S - fi	flow status as per ched height and ju- perched height an- pent urce (storm sewer ted by rip-rap, arm d whether or not p low condition char ow condition char	of bank where so upied or feature flow. Es feature flow. Es imping height d jumping heigh outlet or industration side, or ga erched. If perchanges from dry to tiges from minim	eepage occurs  Estimate volume <0 timate volume to be  t  rial discharge pipe), abion baskets, and record perched a standing water, included to substantial su	<0.5 l/sec or >0 height and jump dependent of ser face flow, indep	ping height.	break	

4-	12001	Proje	10041 HOOK	UB05	Recorder/Crew:	5. Mars	1
tream Name:		Stream	am Code:		Site Code:	sho-we	3-3
ite Limits:	Upstream Downstream	WP#			Field Assessme	nt: Sample 1	Unconnected HDF:  Not connected
irection of Assessment:		Upst Upst	ream 🗆 D	ownstream		☐ Sample 3	to downstream network
low influence	☐ Fresh	et (1)		☐ Spa	te (2)	Base	eflow (3)
low Condition	■ Dry (* □ Stand	ing Water (2)			stitial Flow (3) mal Flow (4)	☐ Sub	stantial Flow (5)
eature Type		ed Natural Char	inel (1)		Defined Feature (4)	☐ Swa	le (7)
1		nelized or Cons	trained (2)		f Feature (5)		dside Ditch (8)
eature Vegetation	☐ Multi- ☐ None (1)	thread (3)	☐ Cropped (3)	☐ Wet	and (6) dow (4) D Scrub	Pond	1 (9)
Riparian Vegetation	La Molle (1)	Lawit (2)	Crapped (3)	LI Mea	dow (4) Li Scruc	oland (5)	b) Li Folest (7)
0-1.5 m Left Bank Right Bank	None (1) None (1)	□ Lawn (2) □ Lawn (2)	☐Cropped (3) ☐ Cropped (3)	□ Meado	Y ALTONOMIC TO THE PARTY OF THE		
1.5 - 10 m Left Bank Right Bank	☐ None (1)☐ None (1)☐	Annual Control of the	☐ Cropped (3)☐ Cropped (3)		dow (4) Scrub dow (4) Scrub		e e
0 - 30 m Left Bank Right Bank	☐ None (1) ☐ None (1)	□ Lawn (2) □ Lawn (2)	☐ Cropped (3) ☐ Cropped (3)		dow (4) Scrub		
Distance (m):  Dominant Substrate (SZ  Sub-Dominant Substrat	!.M3)	(Hard Pan)	Silt Sand (0.0		Gravel (22-66 mm)	Gradient Cobble (67-249 mm)	Boulder (250 mm) Bedrock
Feature Roughness	_	< 10% Minimal		10% Moderal			> 60% Extreme (4)
Vidth Measurement	Can't Meas	40.707	Bankfull (2)	☐ Mean W	idth (3) Estim	ated (4) GIS (5)	Measure/GIS (6)
Channel Dimensions	Feature Width (				Bankfull Depth from		
Entrenchment To	tal:	m $\square_{<40}$	m Left Bank		m Right Bank _	m Tota	widthm
Surface Flow Method	Perched C	ulvert (1)	Hydraulic	Head (2)	☐ Distance b	ov Time (3)	Estimated (4)
Wetted Width (m)	Wetted De	pth (mm)	Hydraulic head (m	7.0	Volume (L) 2 3	Distance (m)	and the second s
	Adjacent	None (1)	☐ Rill (2)	☐ Rill	and Gully (3)	☐ Gully (4) ☐	Outlet Scour (5)
Sediment Transport		☐ Sheet Eros	sion (6)	☐ Inst	eam Bank Erosion (	7)	Other (8)

Date: _		Proje		strained Headwater Drainage Feature Assessment Pg. 2 of 2 Field Assessment: Sample # 1 Sample # 2 Sample # 3
				POINT FEATURE DATA
Ground	rrier Measurer water Indicato	wP#		Perched Height (mm):  Perched Height (mm):  Umping Height (mm):  Jumping Height (mm):  Watercress  Seepage  Bubbling  Stained  Other:  Present  Comment:
WP#	Photo#	Code	Category	Description
Addit	ional Notes	Feature Typ		ature Modifier
Trigge Point Categ	Data	Other: Cor	Ongoing and No Evidence	
_	Spring/upwel Seepage are: Watercress - Outlet (tile or o Beaver dam - Manmade da Other barrier Potential con: Channel hard Culvert - note Flow transitio Flow transitio	a - measure o estimate total other) - record ther) - record ther) - record ther) - record ther) - reasure per m - measure per m - measure per m - measure per m - movem the total there is to the total there is the total the total the total there is the total the	r estimate length surface area occ d flow status as per ched height and j perched height ar lent urce (storm sewel ted by rip-rap, arr d whether or not low condition cha ow condition cha	per feature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature are feature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec. jumping height and jumping height are outlet or industrial discharge pipe).  The remour stone, or gabion baskets.  In perched. If perched record perched height and jumping height.  The remour stone is a perched to standing water, independent of segment break anges from dry to standing water, independent of segment break changes from dry/standing water to interstitial flow, independent of segment break

Date: _ 1 2	12001	Proje	d# 1(0041c	305	Recorder/Crew:	J. Mars	ell
Stream Name:	1-3-0		m Code:		Site Code:	5M0-6	4 4
Site Limits:	Upstream Downstream	WP# WP#			Field Assessmen	t: Sample 1 Sample 2	Unconnected HDF:  Not connected
Direction of Assessment		☐ Upstr	ream 📓 D	lownstream		☐ Sample 3	to downstream netwo
low Influence	☐ Fresh	net (1)		☐ Spate (2)		■ Ba	aseflow (3)
Flow Condition	Dry (	1) ding Water (2)		☐ Interstitia	and the second second	☐ St	ubstantial Flow (5)
eature Type	☐ Defin	ed Natural Chan			ed Feature (4)	□ Sv	wale (7)
1		nnelized or Const	rained (2)	☐ Tiled Fea			oadside Ditch (8)
Feature Vegetation	☐ None (1)	-thread (3)	D 0	☐ Wetland		□ Po	
Riparian Vegetation	I Notic (1)	Lawn (2)	Cropped (3)	☐ Meadow	(4) Scrubi	and (5) D Wetlar	nd(6)
0 - 1.5 m Left Bank Right Bank	□ None (1) □ None (1)		☐ Cropped (3) ☐ Cropped (3)	☐ Meadow (4)	Scrubland (4) Scrubl		
1.5 - 10 m Left Bank Right Bank	□ None(1) □ None (1)		☐ Cropped (3)☐ Cropped (3)		(4) ☐ Scrubi	and the second second second	
10 - 30 m Left Bank Right Bank	☐ None (1) ☐ None (1)	□ Lawn (2) □ Lawn (2)	☐ Cropped (3)☐ Cropped (3)		(4) Scrubi		
Channel Gradient (S4.Il Distance (m):	-	(1) Clinome	_ Elevation (cm	):	Survey Level (4)	Gradie	LIDAR (6)
Distance (m):  Dominant Substrate (S	Clay	(Hard Pan)	1	):		Gradie	
Distance (m):  Dominant Substrate (S Sub-Dominant Substra	Clay 2.M3) te (S2.M3)	(Hard Pan)	Elevation (cm	):	rel (22-66 mm)	Gradie Cobble (67-249 mm)	Boulder (250 mm) Bedroo
Distance (m):  Dominant Substrate (S Sub-Dominant Substra	Clay 2.M3) te (S2.M3)	(Hard Pan)	Elevation (cm	):	rel (22-66 mm)	Gradie Cobble (67-249 mm)	ent (%):
Distance (m):  Dominant Substrate (S Sub-Dominant Substra  Feature Roughness Width Measurement	Clay 2.M3) te (S2.M3)	(Hard Pan)  (Hard Pan)  < 10% Minimal sure (1)	Elevation (cm	): Grav  16-2 mm) Grav  10% Moderate (2)  10% Mean Width	rel (22-66 mm)	Gradie Cobble (67-249 mm)	Boulder (250 mm) Bedroo
Distance (m):  Dominant Substrate (S Sub-Dominant Substra  Feature Roughness Width Measurement Channel Dimensions	Clay 2.M3) te (S2.M3)  Can't Meas	(Hard Pan)  (Hard Pan)  < 10% Minimal sure (1)	Elevation (cm	): Grav  16-2 mm) Grav  10% Moderate (2)  Mean Width  Bank	(22-66 mm)	Gradie Cobble (67-249 mm)  0	Boulder (250 mm) Bedroo
Distance (m):  Dominant Substrate (S Sub-Dominant S Substrate (S Subst	Clay  2.M3)  te (S2.M3)  Can't Meas  Feature Width (  otal:	(Hard Pan)  < 10% Minimal sure (1)  (m):  m	Elevation (cm	): Grav 10-2 mm) Grav 10% Moderate (2) 10% Mean Width Bank	rel (22-66 mm)  40 - 60  (3) Estima  cfull Depth (rom)	Gradie Cobble (67-249 mm)  0	Boulder (250 mm) Bedroo  Boulder (250 mm) Bedroo  Solution Sector
Distance (m):  Dominant Substrate (S Sub-Dominant Substrate (S Sub-Dominant Substrate (S Sub-Dominant Substrate (S Sub-Dominant Substrate (S Surface Flow Method	Clay  2.M3)  te (S2.M3)  Can't Meas  Feature Width ( otal: > 40  Perched C	(Hard Pan)  < 10% Minimal sure (1)  (m):  m	Elevation (cm	): Grav   16-2 mm) Grav   10% Moderate (2)   Mean Width   Bank   m   1	rel (22-66 mm)  40 - 60  (3) Estima  sfull Depth from)  Right Bank  Distance by	Gradie Cobble (67-249 mm)	Boulder (250 mm) Bedrood  Boulder (250 mm) Bedrood  Solution Control  Boulder (250 mm) Bedrood
Distance (m):  Dominant Substrate (S Sub-Dominant S Substrate (S Subst	Clay  2.M3)  te (S2.M3)  Can't Meas  Feature Width ( otal:	(Hard Pan)  < 10% Minimal sure (1)  (m):  m	Elevation (cm	): Grav   16-2 mm) Grav   10% Moderate (2)   Mean Width   Bank   m   1	rel (22-66 mm)  40 - 60  (3) Estima  cfull Depth (rom)	Gradie Cobble (67-249 mm)  0	Boulder (250 mm) Bedrood  Boulder (250 mm) Bedrood  Solution Control  Boulder (250 mm) Bedrood
Distance (m):  Dominant Substrate (S Sub-Dominant Substrate (S Sub-Dominant Substrate (S Sub-Dominant Substrate (S Sub-Dominant Substrate Roughness Width Measurement  Channel Dimensions  Entrenchment To Surface Flow Method  Wetted Width (m)	Clay  2.M3)  te (S2.M3)  Can't Meas  Feature Width ( otal:	(Hard Pan)  < 10% Minimal sure (1)  (m): m	Elevation (cm	): Grav  16-2 mm) Grav  10% Moderate (2)  Mean Width  Bank  m  Head (2)	rel (22-66 mm)  40 - 60  (3) Estimal  cfull Depth (rom)  Right Bank  Distance by  lume (L)  2  3	Gradie Cobble (67-249 mm)  Whigh (3)  Gradie  Gradie  Gradie  Gradie  Gradie  Gradie  Gradie  Tomation  Gradie  Gradie  Gradie  Gradie  Gradie  Tomation  Gradie  Grad	Boulder (250 mm) Bedrood  Boulder (250 mm) Bedrood  Solution Sector Sect
Distance (m):  Dominant Substrate (S Sub-Dominant Substrate (S Sub-Dominant Substrate (S Sub-Dominant Substrate (S Sub-Dominant Substrate (S Surface Flow Method	Clay  2.M3)  te (S2.M3)  Can't Meas  Feature Width ( otal:  > 40  Perched C  Wetted De  1 2	(Hard Pan)  < 10% Minimal sure (1)  (m):  m	Elevation (cm Silt Sand (0.0  (1) 10 - 4  Bankfull (2)   M Left Bank  Hydraulic  Hydraulic head (m 1 2  Rill (2)  ion (6)   Rill (2)	Grave   Grav	ret (22-66 mm)  40 - 60  (3) Estima  sfull Depth from)  Right Bank  Distance by  lume (L)  2 3  Gully (3)	Gradie Cobble (67-249 mm)	Boulder (250 mm) Bedrood  Boulder (250 mm) Bedrood  Solution Sector Sect

Date:		Proje		strained F			eature Assessi		mple # 2	Pg. 2 of 2 Sample # 3
				P	DINT FEAT	TURE DA	TA			
Ground	arrier Measurer water Indicate ollection	wP#	None Absent	Perched Heig	ht (mm): ht (mm):	Jumpin Jumpin	g Height (mm): g Height (mm):	Oth	er:	
WP#	Photo#	Code	Category				Description			
Addit	ional Notes	: No		O dosc	rogod Flow	Conditions	☐ Feature Veg	etation	Ripar	ian Vegetation
Trigge Point Categ	Data	Other: Con	Ongoing and	Active (1) (4)		ric Evidence (	2) Reported bu	t No Evide	ence (3)	
POINT  A B C D E F G H I	Seepage area Watercress - Outlet (tile or ol Inlet (tile or ol Beaver dam - Manmade dar Other barrier Potential cont	a - measure or estimate total : other) - record fl measure pero m - measure p to fish movement	estimate length surface area oc flow status as ow status as pe hed height and erched height a ent rce (storm sewi	cupied per feature flow, to r feature flow, to jumping height and jumping height er outlet or indu	seepage occurs  Estimate volume to	be <0.5 l/sec	0.5 l/sec. Measure te or >0.5 l/sec.	mperature		

Date:   Yal	1200/18	Projec	1#: \Coc41	0825	Recorder/Crew.	J. Marse	1/2
Stream Name:	ment on		m Code:		Site Code:	SMO-WC	
Site Limits:	Upstream Downstream	WP# WP#			Field Assessment:	Sample 1 Sample 2	Unconnected HDF:
Direction of Assessmen		☐ Upstr	aam 📓 Do	ownstream		☐ Sample 3	to downstream netwo
low Influence	☐ Fresh	et (1)		☐ Spate	(2)	■ Base	flow (3)
Flow Condition	☐ Dry (1☐ Stand	ing Water (2)		☐ Interst	itial Flow (3) al Flow (4)	☐ Subs	stantial Flow (5)
eature Type	☐ Define	ed Natural Chan nelized or Const		☐ No De	fined Feature (4) eature (5)	☐ Swale ☐ Road ☐ Pond	Iside Ditch (8)
Feature Vegetation		☐ Lawn (2)	Cropped (3)		ow (4) Scrublar		6)
Riparian Vegetation 0 - 1.5 m Left Bank Right Bank		□ Lawn (2) □ Lawn (2)	☐Cropped (3) ☐ Cropped (3)	□ Meadow □ Meado	And the second second second second		
1.5 - 10 m Left Bank Right Bank		☐ Lawn (2) ☐ Lawn (2)	☐ Cropped (3) ☐ Cropped (3)	☐ Meado	ow (4) Scrublar	A STATE OF THE PARTY OF THE PAR	
10 - 30 m Left Bank Right Bank		☐ Lawn (2) ☐ Lawn (2)	☐ Cropped (3) ☐ Cropped (3)	☐ Meado	ow (4) Scrublar		
Channel Gradient (S4. Distance (m):	.M/) Livisual	(1) Clinome	eter (2) Lase Levation (cm)		Survey Level (4)	Other (5) Gradient	LiDAR (6) (%)
Distance (m):  Dominant Substrate (	Clay ( <b>S2.M3)</b>	(1) LIClinome		):		Gradient	(%)
Distance (m):  Dominant Substrate (Sub-Dominant Substrate Roughness Width Measurement	Clay (S2.M3) rate (S2.M3)  Can't Meas	(Hard Pan)  (Hard	Elevation (cm) Silt Sand (0.00	): 16-2 mm) Gi 10% Moderate 10% Moderate Mean Wid	ravel (22-66 mm) C  (2) 40 - 60%  th (3) Estimate	Gradient obble (67-249 mm) B	(%) Soulder (250 mm) Bedroc
Distance (m):  Dominant Substrate (Sub-Dominant Substr Feature Roughness Width Measurement Channel Dimensions	Clay (S2.M3)  rate (S2.M3)  Can't Meas  Feature Width (r	(Hard Pan)	Elevation (cm) Silt Sand (0.00	): 16-2 mm) Gr 10 Gr 10% Moderate 10% Mean Wid	ravel (22-66 mm) C  (2)	Gradient obble (67-249 mm) B	Soulder (250 mm) Bedroc  Goulder (250 mm) Bedroc  Measure (4)  Measure/GJS (6)
Distance (m):  Dominant Substrate (Sub-Dominant Substrate Roughness Width Measurement Channel Dimensions	Clay (S2.M3)  rate (S2.M3)  Can't Meas  Feature Width (r	(Hard Pan)  < 10% Minimal ( sure (1)	Elevation (cm)  Silt Sand (0.00  C  1) 10 -40  Bankfull (2) C	): 16-2 mm) Gi 10% Moderate 10% Mean Wid Ba	ravel (22-66 mm) C  (2)	Gradient  obble (67-249 mm) B  High (3)	oulder (250 mm) Bedroc  Goulder (250 mm) Bedroc  Goulder (250 mm) Bedroc  Goulder (250 mm) Bedroc  Measure (4)  Measure/GIS (6)
Distance (m):  Dominant Substrate (Sub-Dominant Substrate Roughness Width Measurement Channel Dimensions Entrenchment	Clay ( S2.M3)  rate (S2.M3)  Can't Meas  Feature Width (r  Total:	(Hard Pan)  < 10% Minimal ( sure (1)	Elevation (cm)  Silt Sand (0.00  C  1) 10 -40  Bankfull (2) C  T Left Bank  Hydraulic  Hydraulic head (mo	): 16-2 mm) Gi 10% Moderate 10% Mean Wid 10 Ba 10 m Head (2)	ravel (22-66 mm) C  (2)	Gradient  obble (67-249 mm) B  High (3)	Soulder (250 mm) Bedrocc  Government Governm

Date:		Proje	Uncon			rainage Fe	ature Assessi		Pg. 2 of 2 2 Sample # 3
7				P	OINT FEAT	TURE DA	TA		
Ground	orrier Measuren  Newater Indicate  Offection	WP#		Perched Hei	ght (mm): ght (mm):	Jumping Jumping	Height (mm): Height (mm):	Other:	
WP#	Photo #	Code	Category				Description		
Addit	ional Notes		No vi	Lar oi	oservid o observ	d			
Site B Trigge		Feature Typ Other: Con	nments	ure Modifier	Flow	Conditions			parian Vegetation
Point Categ			Ongoing and No Evidence			ic Evidence (2) own (5)	Reported but	No Evidence (3	
POINT	Seepage area Watercress - Outlet (tile or of Inlet (tile or of Beaver dam - Manmade dam Other barrier t Potential conti- Channel harde Culvert - note Flow transition Flow transition Flow transition	r-measure of estimate total other) - record from easure per on - measure per of fish movem armination southing - indicate type, size and a point D/S - fish point M/S- fish during non-fish during non-fish and total point fish a point D-S/IF-during non-fish and total point fish and t	low status as per ched height and jourched height and ent erce (storm sewer led by rip-rap, arr d whether or not place condition challow condition challow condition challow	of bank where upied ar feature flow. I may be in the properties of	seepage occurs  Estimate volume to ght strial discharge pip gabion baskets, ched record perch to standing water, imal to substantial	e).  ed height and juicindependent of surface flow, independent.	mping height.	nt break	

late: Mai &	100e/r	Proje	et#: Voc+4	10325	Recorder/Crew.	J Mas	110
Stream Name:	1,1		m Code:	1000	Site Code:	540 - W	
Site Limits:	Upstream Downstream	WP# WP#			Field Assessmen	-10	Unconnected HDF:
Direction of Assessment:		W Upst	ream 🗆	Downstream		☐ Sample 3	to downstream network
low Influence	☐ Freshe	A (1)		☐ Spa	ite (2)	Base	eflow (3)
Flow Condition	Dry (1)	ng Water (2)			rstitial Flow (3)	☐ Subs	stantial Flow (5)
Feature Type	☐ Define	d Natural Char relized or Cons		□ No!	Defined Feature (4) d Feature (5)	☐ Swal	e (7) Iside Ditch (8)
$\overline{}$	☐ Multi-ti			☐ Wet		☐ Pond	
Feature Vegetation Riparian Vegetation	☐ None (1)	☐ Lawn (2)	Cropped (3)	☐ Mea	adow (4) 🔲 Scrub	land (5)   Wetland(	6) D Forest (7)
0 - 1.5 m Left Bank Right Bank		]Lawn (2)	☐ Cropped (3) ☐ Cropped (3)	☐ Meado	ow (4) Scrublan adow (4) Scrub		
1.5 - 10 m Left Bank Right Bank		☐ Lawn (2) ☐ Lawn (2)	☐ Cropped (3)		adow (4) Scrub	the second secon	The second secon
10 - 30 m Left Bank Right Bank		□ Lawn (2) □ Lawn (2)	☐ Cropped (3)		adow (4) Scrub		
Dominant Substrate (S. Sub-Dominant Substra	2.M3)	Hard Pan)	Silt Sand (0	0.06-2 mm)	Gravel (22-66 mm)	Cobble (67-249 mm) E	Boulder (250 mm) Bedrock
Feature Roughness Width Measurement	☐ Can't Measu	10% Minimal		- 40% Modera			60% Extreme (4)  Measure/GIS (6)
Channel Dimensions	Feature Width (m	n):			Bankfull Depth (mm)		
Entrenchment To	otal:	1 40	m Left Bank		m Right Bank	m Tota	widthm
Surface Flow Method	Perched Cul	Ivert (1)	☐ Hydrau	lic Head (2)	☐ Distance b	y Time (3)	Estimated (4)
Wetted Width (m)	Wetted Dep		Hydraulic head (	(mm) 3 1	Volume (L) 2 3	Distance (m)	Time (s) 3 1 2
Nla							

Date:		Proio	Unconstraine			ature Assessme	nt □ Sample#2	Pg. 2 of 2  Sample # 3
		Fide	u #	POINT FEAT	The same		- Sample # 2	32.00
Ground	mier Measuren water Indicato	WP#		Height (mm): Height (mm): ess Seepage	Jumping Jumping	Height (mm); Height (mm);	Other	
WP#	Photo#	Code	Category			Description		
Addit		Feature Typ				☐ Feature Vegetal	ion 🔲 Ripai	rian Vegetation
	r 🗆	Other: Con				В	E 11 (0)	
Trigge Point Categ			Ongoing and Active (1 No Evidence (4)	) Historic Unknov	Evidence (2 wn (5)	Reported but No	Evidence (3)	

ate: Mai S	1000/50	Project #:	16041080	5 Recorder/Crew	J. Marsell	
tream Name:		Stream Code		Site Code	SMD-WCD	-31
ite Limits:	Upstream Downstream	WP#		Field Assessment	25 Val. (Apr. 1)	nconnected HDF:  Not connected
irection of Assessment		■ Upstream	☐ Downstre			to downstream networ
low Influence	☐ Freshet (	1)		Spate (2)	Baseflow	(3)
low Condition	Dry (1)  Standing	Water (2)		Interstitial Flow (3) Minimal Flow (4)	☐ Substantia	al Flow (5)
sature Type		Natural Channel (1)		No Defined Feature (4)	☐ Swale (7)	DOLL W
1	☐ Channeli ☐ Multi-thre	zed or Constrained (		Tiled Feature (5)	☐ Roadside ☐ Pond (9)	Ditch (8)
eature Vegetation	□ None (1) □			Wetland (6) Meadow (4)   Scrubla		☐ Forest (7)
_						3
Riparian Vegetation I - 1.5 m Left Bank Right Bank				eadow (4) Scrubland Meadow (4) Scrubla		□Forest (7) □ Forest (7)
1.5 - 10 m Left Bank Right Bank	□ None (1) □ None (1) □	The state of the s		Meadow (4) ☐ Scrubla Meadow (4) ☐ Scrubla	The state of the s	☐ Forest (7) ☐ Forest (7)
10 - 30 m Left Bank Right Bank				Meadow (4) ☐ Scrubla Meadow (4) ☐ Scrubla	The second secon	☐ Forest (7) ☐ Forest (7)
Dominant Substrate (S Sub-Dominant Substra		rd Pan) Silt	Sand (0.06-2 mm)	Gravel (22-66 mm) C	obble (67-249 mm) Bould	er (250 mm) Bedrock
B /	17.	0% Minimal (1)	T140 409/14-	derate (2) 40 - 60%	( (I) - (0) [] [] ann	
Feature Roughness Width Measurement	☐ Can't Measure			an Width (3) Estimate		Extreme (4) leasure/GIS (6)
Channel Dimensions	Feature Width (m):			Bankfull Depth (mnt)		
Entrenchment To	otal:	□ < 40 m	Left Bank	m Right Bank	m Total widt	h m
Surface Flow Method	Perched Culve	ort (1)	Hydraulic Head (2	2) Distance by	Time (3)	stimated (4)
Wetted Width (m)	Wetted Depth		aulic head (mm)	Volume (L)	Distance (m)	Time (s)
Na.	1 2	3 1	2 3	1 2 3	1 2 3	1 2 3
Imbrined Eramport	D 741 - 777	Sheet Erosion (6)		Instream Bank Erosion (7)		

PILT st	10) Project		eadwater Drainage Fe  Field Assessment:		Pg 2 of 2 ample # 2 Sample # 3
7014 31	7(31, 10)00		DINT FEATURE DA	******	
ish Barrier Measure roundwater Indica sh Collection	ors UP#	Perched Heigh Perched Heigh	nt (mm) Jumping nt (mm): Jumping	Height (mm): Height (mm):	ther:
WP# Photo #	Code	Category		Description	
dditional Note	51	+ No Ho	0		
	Feature Type		☐ Flow Conditions	☐ Feature Vegetation	☐ Riparian Vegetation
Point Data Category		Ongoing and Active (1) No Evidence (4)	Historic Evidence (2 Unknown (5)	Reported but No Evid	dence (3)
Seepage are Watercress Outlet (tile or or Beaver dam Manmade da Other barrier Potential cor Channel han Culvert - not Flow transitic	a - measure or e estimate total si other) - record fo ther) - record flo - measure perch om - measure per to fish movement tamination source dening - indicated to type, size and vo on point D/S - flow	ow status as per feature flow. E hed height and jumping height erched height and jumping height ent ce (storm sewer outlet or indused by rip-rap, armour stone, or g whether or not perched. If perconduction changes from dry to we condition changes from mining flow condition changes from dry to	seepage occurs  Estimate volume <0.5 l/sec or >0 stimate volume to be <0.5 l/sec of ht trial discharge pipe).	umping height.  I segment break  dependent of segment break	

Date: 344 36	1000/	Project	# 160410	325 Re	ecorder/Crew	J. Masel	\
Stream Name:		Stream			e Code:	5MD-W	
Site Limits:	Upstream	WP#		Fie	eld Assessment	☐ Sample 1	Unconnected HDF:
		WP#				☐ Sample 2	□ Not connected
Direction of Assessment:		Upstrea	m 🗆 D	ownstream		Sample 3	to downstream networ
low Influence	☐ Freshet (1	)		☐ Spate (2)		Base	flow (3)
Flow Condition	Dry (1)  Standing V	Water (2)		☐ Interstitial F		☐ Subs	tantial Flow (5)
eature Type	☐ Defined N		(1)	☐ No Defined	Feature (4)	☐ Swale	e (7)
1	☐ Channelize		ned (2)	☐ Tiled Featu	ire (5)	☐ Road	Iside Ditch (8)
	☐ Multi-threa			☐ Wetland (6		☐ Pond	
eature Vegetation	□ None (1) □	Lawn (2)	Cropped (3)	☐ Meadow (4	) Scrubland	d (5) Wetland(6	6)
Riparian Vegetation				200			
)-1.5 m Left Bank Right Bank	The second secon		☐ Cropped (3) ☐ Cropped (3)	☐ Meadow (4) ☐ Meadow (4)	□Scrubland (		
1.5 - 10 m Left Bank Right Bank		Lawn (2) Lawn (2)	Cropped (3) Cropped (3)	☐ Meadow (4			and the second s
0 - 30 m Left Bank Right Bank		Lawn (2) Lawn (2)	☐ Cropped (3)☐ Cropped (3)		Scrubland		
Channel Gradient (S4.M				revel (3) S	Survey Level (4)	Other (5) Gradient (	LiDAR (6)
Distance (m):  Dominant Substrate (S.	Clay (Hard 2.M3)	Clinomete	er (2) Lase	):	(22-66 mm) Co	Other (5) Gradient (	LiDAR (6)
Distance (m):  Dominant Substrate (S. Sub-Dominant Substra	Clay (Hard 2.M3)	Clinomete	Elevation (cm) Silt Sand (0.0)	1 (3) S	(22-66 mm) Co	Other (5)  Gradient ( bble (67-249 mm) B	LiDAR (6)  (%)  coulder (250 mm) Bedrock
Distance (m):  Dominant Substrate (Si Sub-Dominant Substrate Feature Roughness	Clay (Hard 2.M3)	Clinomete d Pan)	Elevation (cm) Silt Sand (0.0)	6-2 mm) Gravel	(22-66 mm) Co	Other (5)  Gradient ( bble (67-249 mm) B	LiDAR (6)  (%):    Coulder (250 mm)   Bedrock   Coulder   Coulder
Distance (m):  Dominant Substrate (S. Sub-Dominant Substrate (S. Sub-Domina	Clay (Harr 2.M3) Clay (= 10	Clinomete d Pan)	Elevation (cm) Silt Sand (0.0)	6-2 mm) Gravel 0% Moderate (2) Mean Width (3)	(22-66 mm) Co	Other (5)  Gradient (  bble (67-249 mm) B	LiDAR (6)  (%):    Coulder (250 mm)   Bedrock   Coulder   Coulder
Distance (m):  Dominant Substrate (S. Sub-Dominant Substrate (S. Substrate (S	Clay (Hard 2.M3)	Clinomete d Pan)	Elevation (cm) Silt Sand (0.0)  C C C C C C C C C C C C C C C C C C C	6-2 mm) Gravel  0% Moderate (2)  Mean Width (3)	(22-66 mm) Co	Other (5)   Gradient (bble (67-249 mm)   B   Gradient (1)   Grad	LiDAR (6)  (%):    Coulder (250 mm)   Bedrock   Coulder   Coulder
Distance (m):  Dominant Substrate (Significant Substrate (Significan	Clay (Hard 2.M3) Clay (Hard 2.M3) Can't Measure (Feature Width (m):	Clinomete d Pan)  % Minimal (1) (1)  < 40 m	Elevation (cm) Silt Sand (0.0)  C C C C C C C C C C C C C C C C C C C	6-2 mm) Gravel  0% Moderate (2)  Mean Width (3)  Bankfu	(22-66 mm) Co	Other (5)   Gradient (bble (67-249 mm)   B   Gradient (1)   Grad	LiDAR (6)  (%)  boulder (250 mm) Bedrock  Coulder (250 mm) Bedrock  Co
Distance (m):  Dominant Substrate (S. Sub-Dominant Substrate (S. Sub-Dominant Substrate (S. Sub-Dominant Substrate (S. Sub-Dominant Substrate Roughness (S. Width Measurement (S. Surface Flow Method (Method Wetted Width (m))	Clay (Hard 2.M3)  te (S2.M3)  Can't Measure ( Feature Width (m):  btal: > 40 m  Perched Culvert  Wetted Depth ( 1 2	Clinomete  d Pan)  Minimal (1)  (1)  < 40 m  t (1)	Elevation (cm) Silt Sand (0.0)	Nevel (3) S  6-2 mm) Gravel  6-2 mm) Gravel  Mean Width (3)  Bankfu  m Rig  Head (2) C	(22-66 mm) Co	Other (5)   Gradient (bble (67-249 mm)   B   Gradient (1)   Grad	LiDAR (6)  (%)  oulder (250 mm) Bedrock  60% Extreme (4)  Measure/GIS (6)  widthm  Estimated (4)  Time (s)
Distance (m):  Dominant Substrate (St. Sub-Dominant Substrate (St. Sub-Dominant Substrate (St. Sub-Dominant Substrate (St. Sub-Dominant Substrate Roughness (St. Substrate	Clay (Hard 2.M3)  te (S2.M3)  Can't Measure ( Feature Width (m):  Datal:  Perched Culvert  Wetted Depth ( 1 2	Clinomete d Pan)  % Minimal (1) (1)  40 m  t (1) (mm)	Elevation (cm) Silt Sand (0.0)	Nevel (3) S  6-2 mm) Gravel  0% Moderate (2)  Mean Width (3)  Bankfu  m Rig  Head (2) C	(22-66 mm) Co (22-66 mm) Co (21 do - 68%) Estimated (III Depth (mm)) (III Depth (mm)) (III Distance by Time (L) (2 3	Other (5)   Gradient (5)   bble (67-249 mm)   B     High (3)     >     Mathematical Mathematic	LiDAR (6)  (%)  boulder (250 mm) Bedrock  60% Extreme (4)  Measure/GIS (6)  widthm  Estimated (4)  Time (s)

Date:		Proje	Uncon			rainage Fe Assessment:	ature Assessn	nent Sample	Pg. 2 of 2 # 2 Sample # 3
				PC	DINT FEAT	URE DA	TA		
Ground	rrier Measurer water Indicate	WP#	None	Perched Heig Perched Heig Watercress Present	ht (mm): ht (mm):	Jumping	Height (mm): Height (mm):	Other	
WP#	Photo #	Code	Category				Description		
Addit	ional Notes		No.	water					
Site B	_	Feature Typ		ure Modifier	☐ Flow (	Conditions	☐ Feature Vege	tation	Riparian Vegetation
Point I	Data	Omer. our	Ongoing and No Evidence			ic Evidence (2 own (5)	Reported but	No Evidence	(3)
ABCDEFGTIJKLMZOPQ	Seepage area Watercress Outlet (tile or Inlet In	a - measure or estimate total other) - record fineasure perdim - measure perdim - measure perdim - indicated type, size and point D/S - flin point M/S- flin point D-S/IF-1 during non-firent source	low status as per ched height and j erched height ar ent rce (storm sewel ed by rip-rap, ard d whether or not j ow condition cha	of bank where upied er feature flow. I umping height d jumping height outlet or industrial outlet or industrial from drynges from drynges from dinanges from d	seepage occurs  Estimate volume Estimate volume to ght  strial discharge pip gabion baskets ched record perch- to standing water, mal to substantial	e).  ed height and juindependent of surface flow, in	imping height.	nt break	

Date: July &	12021	Projec*	#: 1604100	125	Recorder/	/Crew:	J. Marsell	
Stream Name;			Code:		Site Code		540- WC	(-A
Site Limits:	Upstream Downstream	WP# WP#			Field Asse	sessment:	☐ Sample 1 ☐ Sample 2	Unconnected HDF:  Not connected
Direction of Assessment:		Upstre	am 🗆 D	ownstream			Sample 3	to downstream networ
Flow Influence	☐ Freshe	et (1)		☐ Spa	te (2)		■ Base	flow (3)
Flow Condition	Dry (1	) ing Water (2)			rstitial Flow (3) imal Flow (4)	X.	☐ Subs	stantial Flow (5)
Feature Type	☐ Define	ed Natural Channe nelized or Constra thread (3)		□ No [	Defined Featur d Feature (5)	re (4)	Swale Road Pond	Iside Ditch (8)
Feature Vegetation		☐ Lawn (2)	☐ Cropped (3)	☐ Mea	idow (4)	Scrubland (5	i) 🔲 Wetland(6	6)
0 - 1.5 m Left Bank Right Bank		Lawn (2)	□Cropped (3) □ Cropped (3)	□ Meado		Scrubland (5) Scrubland (5	☐Wetland (6)	
1.5 - 10 m Left Bank Right Bank	☐ None (1) ☐ None (1)	☐ Lawn (2) ☐ Lawn (2)	Cropped (3)	☐ Mea	A STATE OF THE STA	Scrubland (5) Scrubland (5)		
10 - 30 m Left Bank Right Bank		☐ Lawn (2) ☐ Lawn (2)	☐ Cropped (3)	☐ Mea	adow (4)	Scrubland (5)		
Distance (m):  Dominant Substrate (S	S2.M3)	(Hard Pan)	Silt Sand (0.0		Gravel (\$2-66	mm) Cobbli	Gradient ( e (67-249 mm) Br	oulder (250 mm) Bedrock
Feature Roughness Width Measurement Channel Dimensions	☐ Can't Meas			40% Moderat		40 - 60% Hig Estimated (4)	\	60% Extreme (4)  Measure/GIS (6)
Entrenchment To	otal: D > 40 r	m	n Left Bank		m Right Ban	ık	m Total	widthm
Surface Flow Method  Wetted Width (m)	Perched Co Wetted Dep 1 2	pth (mm)	Hydraulic Head (m 1 2		Volume (L)	tance by Time	Distance (m) 1 2	
Sediment Transport		None (1)  Sheet Erosic None (1)	□ Rill (2) on (6) □ Rill (2)	☐ Instr	and Gully (3) ream Bank Ero and Gully (3)	osion (7)	Gully (4)	Outlet Scour (5) Other (8) Outlet Scour (5) Other (8)

ite: 34	المام المام ا	Unconstrained He	radwater Drainage Feature Assessment Pg. 2 of 2  Field Assessment: Sample # 1 Sample # 2 Sample # 3
le	7.30/3/ Projec		Field Assessment. — dample in F
ish Barrier M roundwater ish Collectio		Perched Height Perched Height None Watercress Absent Present	INT FEATURE DATA  (mm): Jumping Height (mm): (mm): Jumping Height (mm):  Seepage Bubbling Stained Other: Comment:
WP# Pho	to# Code	Category	Description
		* \( \mathcal{P} \)	o HoG observed Jane soils + regelation throughout
#			
Additional	Notes:	⊋ ☐ Feature Modifier	☐ Flow Conditions ☐ Feature Vegetation ☐ Riparian Vegetation
rigger Point Data	Other: Com		Historic Evidence (2) Reported but No Evidence (3)
Category		No Evidence (4)	
Seeps Water Outlet Inlet (in Beave Manm Other Poten	g/upwelling - estimate of age area - measure or cress - estimate total so (tile or other) - record file or other) - record file or dam - measure perol ade dam - measure per barrier to fish movemental contamination sour	flow status as per feature flow. Est ow status as per feature flow. Est hed height and jumping height erched height and jumping height ont ce (storm sewer outlet or industrict to by rip-rap, armour stone, or ga	eepage occurs  Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature.  timate volume to be <0.5 l/sec or >0.5 l/sec.  t  rial discharge pipe).

Date: July 30	1000/	Project	# 160410	0395	Recorder/Crew	J. Marsel	1
Stream Name:		Stream			Site Code	5/40-W	
Site Limits:	Upstream Downstream	WP#			Field Assessment	☐ Sample 1 ☐ Sample 2	Unconnected HDF  Not connected
Direction of Assessment.		Upstrea	m D D	ownstream		Sample 3	to downstream netwo
Flow Influence	☐ Freshet (	1)		☐ Spate (2)		■ Base	flow (3)
Flow Condition	Dry (1)  Standing	Water (2)		☐ Interstitia☐ Minimal f		☐ Subst	tantial Flow (5)
Feature Type	☐ Defined N ☐ Channeli: ☐ Multi-thre	Natural Channe zed or Constrai aad (3)	ined (2)	No Defin Tiled Fea	ed Feature (4) sture (5) (6)	☐ Pond	side Ditch (8)
Feature Vegetation	None (1)	Lawn (2)	Cropped (3)	☐ Meadow	(4) Scrubland	(5) Wetland(6	5)
0 - 1.5 m Left Bank Right Bank			Cropped (3) Cropped (3)	☐Meadow (4) ☐ Meadow			☐ Forest (7) ☐ Forest (7)
1.5 - 10 m Left Bank Right Bank			☐ Cropped (3) ☐ Cropped (3)		(4) Scrubland (4) Scrubland		
10 - 30 m Left Bank Right Bank			Cropped (3)		(4) Scrubland (4) Scrubland		
Distance (m):	-		Elevation (cm)	<u>_</u> -	Survey Level (4)	Other (5) Gradient (	
Distance (m):  Dominant Substrate (S): Sub-Dominant Substrat		rd Pan) S	Silt Sand (0.0	<u>_</u> -		Gradient (	
Dominant Substrate (S.	2.M3)	] ] 0% Minimal (1)	Silt Sand (0.0	6-2 mm Grav	el (22-66 mm) Cob	Gradient (*  Oble (67-249 mm) Bo	%):
Dominant Substrate (S) Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions	2.M3)	0% Minimal (1)	Silt Sand (0.0)	6-2 mm) Grav 0% Moderate (2) Mean Width (	el (22-66 mm) Cot  40 - 60% H  3) Estimated  full Depth (mm)	Gradient (**  oble (67-249 mm) Bo	oulder (250 mm) Bedrood  Grant
Dominant Substrate (S) Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions Entrenchment To	te (S2.M3)  Can't Measure  Feature Width (m):	0% Minimal (1) (1)	Silt Sand (0.0)	6-2 mm) Grav 0% Moderate (2) Mean Width (	el (22-66 mm) Cot  40 - 60% H  3) Estimated  full Depth (mm)	Gradient (**  oble (67-249 mm) Bo	%):  Doulder (250 mm) Bedrood  D  Gow Extreme (4)  Measure/GIS (6)  widthm
Dominant Substrate (S) Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions Entrenchment To Surface Flow Method	te (S2.M3)  te (S2.M3)  Can't Measure  Feature Width (m):  total: > 40 m  Perched Culve	0% Minimal (1) (1)	Silt Sand (0.0	6-2 mm) Grav 0% Moderate (2) Mean Width ( Bank m F	el (22-66 mm) Cob  40 - 60% H  3) Estimated  full Depth (mm)  Right Bank  Distance by Tin	Gradient (**  Oble (67-249 mm) Bo	bulder (250 mm) Bedrood  Gow Extreme (4)  Measure/GIS (6)  widthm  Estimated (4)
Dominant Substrate (S) Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions Entrenchment To	te (S2.M3)  Can't Measure  Feature Width (m):	0% Minimal (1) (1)	Silt Sand (0.0)	6-2 mm) Grav 0% Moderate (2) Mean Width ( Bank m F	el (22-66 mm) Cot  40 - 60% H  3) Estimated  full Depth (mm)	Gradient (**  oble (67-249 mm) Bo	oulder (250 mm) Bedrood  Gow Extreme (4)  Measure/GIS (6)  widthm  Estimated (4)  Time (s)
Dominant Substrate (S) Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions Entrenchment To Surface Flow Method Wetted Width (m)	te (S2.M3)  te (S2.M3)  Can't Measure  Feature Width (m):  btal: > 40 m  Perched Culve  Wetted Depth  1 2	0% Minimal (1) (1)	Silt Sand (0.0)	6-2 mm) Grav 0% Moderate (2) Mean Width ( Bank m F Head (2) m) Vol 3 1	el (22-66 mm) Cot  40 - 60% H  3) Estimated  full Depth (mm)  Right Bank  Distance by Tin  ume (L)  2 3	Gradient (**  oble (67-249 mm) Bo	oulder (250 mm) Bedrood  60% Extreme (4)  Measure/GIS (6)  widthm  Estimated (4)  Time (s)
Dominant Substrate (S) Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions Entrenchment To Surface Flow Method Wetted Width (m)	te (S2.M3)  te (S2.M3)  Can't Measure  Feature Width (m):  Datal: > 40 m  Perched Culve  Wetted Depth  1 2  Adjacent  Feature	0% Minimal (1)  (1)	Silt Sand (0.0)	6-2 mm) Grav  0% Moderate (2)  Mean Width (  Bank  m F  Head (2)  m) Vol  3 1  □ Rill and 0	el (22-66 mm) Cob  40 - 60% H  3) Estimated  full Depth (mm)  Right Bank  Distance by Tin  ume (L)  2 3  Gully (3)	Gradient (**  Oble (67-249 mm) Bo	oulder (250 mm) Bedrood  Gow Extreme (4)  Measure/GIS (6)  widthm  Estimated (4)  Time (s)

ate:	24130	2) Proje					ature Assessme		ple # 2	Pg 2 of 2 Sample # 3
					T FEATU			_		
Fround	rrier Measuren Iwater Indicato	wP#	Pen	ched Height (m ched Height (m ercress	m) m)	Jumping Jumping	Height (mm)	Othe	r	
WP#	Photo#	Code	Category				Description			
	ional Notes	Eeature Typ	* No P	e soil	5 ' ve		Feature Vegel	tation	□ Riparia	an Vegetation
rigge Point Categ	Data	Other: Con	Ongoing and Activ			Evidence (2 n (5)	Reported but (	No Evider	nce (3)	
- 41.03	., <b>,</b>									

Jate _ 30/4 9	1000/00	Project #:	Vacus 325	Recorde	er/Crew 3	Morsell	
tream Name:		Stream Code		Site Cod	le: 5	MO-WCB	5-B
lite Limits:	Upstream Downstream	WP# WP#				Sample 2	Uncommected HDF.  Not connected
Direction of Assessment		Upstream	☐ Downstre	eam	100	Sample 3	to downstream network
low Influence	☐ Freshet (1	1)		Spate (2)		Baseflov	v (3)
low Condition	Dry (1)  Standing	Water (2)		Interstitial Flow (4)		☐ Substan	tial Flow (5)
eature Type	☐ Defined N	Vatural Channel (1) zed or Constrained (2	2)	No Defined Feature (5) Wetland (6)	ure (4)	Swale (7  Roadsid  Pond (9)	e Ditch (8)
eature Vegetation	□ None (1) □	Lawn (2)		Meadow (4)	Scrubland (5)	☐ Wetland(6)	☐ Forest (7)
) - 1.5 m Left Bank Right Bank				the state of the s	Scrubland (5) 1 Scrubland (5)	□Welland (6) □ Welland (6)	□ Forest (7) □ Forest (7)
1.5 - 10 m Left Bank Right Bank		1				☐ Welland (6) ☐ Welland (6)	☐ Forest (7) ☐ Forest (7)
0 - 30 m Left Bank Right Bank				Meadow (4)  Meadow (4)		☐ Wetland (6) ☐ Wetland (6)	☐ Forest (7) ☐ Forest (7)
Dislance (m):  Dominant Substrate (S Sub-Dominant Substra		rd Pan) Silt	Sand (0.06-2 mm	ri) Gravel (22-6	6 mm) Cobble (6	Gradient (%) 7-249 mm) Boul	der (250 mm) Bedrock
Feature Roughness Width Measurement	☐ Can't Measure	0% Minimal (1)	10 - 40% Mo	an Width (3)	40 - 60% High (3		% Extreme (4) Measure/GIS (6)
Channel Dimensions  Entrenchment To	Feature Width (m): otal:	□ <40 m	Left Bank	Bankfull Dep	/_	m Total wid	dthm
Surface Flow Method Wetted Width (m)	Perched Culve Wetted Depth 1 2		Hydraulic Head ( sulic head (mm) 2 3	2) Dis	stance by Time (3)	Distance (m)	Estimated (4)  Time (s) 1 2 3
Cle	Adjacent 💆	None (1)	□ Rill (2) □	Rill and Gully (3)	)	(4) 🗆 Out	let Scour (5)

Date:	2430	2) Proje		eadwater Drainage Fe	_	Pg. 2 of 2  ample # 2 Sample # 3
			PC	DINT FEATURE DA	TA	
Ground	rner Measurer water Indicate	WP#	Perched Heig Perched Heig	ht (mm): Jumpin; ht (mm): Jumpin;  ☐ Seepage ☐ Bubblin	g Height (mm) g Height (mm);	ther
WP#	Photo #	Code	Category		Description	
Additi	onal Notes		* No	Hao	Johan.	
Site Bi		Feature Typ	e	Flow Conditions	☐ Feature Vegetation	Riparian Vegetation
Point I	Data		Ongoing and Active (1) No Evidence (4)	Historic Evidence ( Unknown (5)	2) Reported but No Evid	dence (3)
ABCDEFGHIJKLM	Seepage area Watercress - Outlet (tile or Inlet (tile or of Beaver dam - Manmade dar Other barrier Potential cont Channel hard Culvert - note Flow transition Flow transition	a - measure or estimate total : other) - record fl measure perc n - measure p of fish movement amination sou ening - indicate type, size and n point D/S - flo n point M/S- flo	low status as per feature flow. It ched height and jumping height erched height and jumping height ent roe (storm sewer outlet or indused by rip-rap, armour stone, or it whether or not perched. If per ow condition changes from dry ow condition changes from minimum.	seepage occurs  Estimate volume <0.5 l/sec or > Estimate volume to be <0.5 l/sec  ant ant antial discharge pipe).	or >0.5 l/sec. jumping height. of segment break ndependent of segment break	

Pate: July Sc	1000/	Projec	# 160410	30.05	Recorder/Crew	J Marsel	\
stream Name:	Clava.		n Code:	2.63	Site Code	5MD-1	
Site Limits:	Upstream Downstream	WP# WP#			Field Assessment.	Sample 1 Sample 2	Unconnected HDF  Not connected
Direction of Assessment		☐ Upstre	am 🔳 🗈	Downstream		Sample 3	to downstream networ
low Influence	☐ Freshe	(1)		☐ Spate (	2)	■ Base	flow (3)
low Condition	■ Dry (1) □ Standir	ng Water (2)		☐ Interstif	ial Flow (3) I Flow (4)	☐ Subs	stantial Flow (5)
eature Type		d Natural Chann elized or Constr pread (3)		☐ No Def ☐ Tiled Fo		☐ Swal	side Ditch (8)
eature Vegetation	□ None (1)	☐ Lawn (2)	☐ Cropped (3)	☐ Meado	w (4) Scrublan	d (5) U Wetland(	6) D Forest (7)
1-1.5 m Left Bank Right Bank		St awn (2)  Dawn (2)	□Cropped (3) □ Cropped (3)	☐ Meadow (			
1.5 - 10 m Left Bank Right Bank		Lawn (2)	Cropped (3) Cropped (3)	☐ Meado	w (4) Scrublan	the state of the s	
10 - 30 m Left Bank Right Bank	100	☐ Lawn (2) ☐ Lawn (2)	☐ Cropped (3) ☐ Cropped (3)		w (4) Scrublan		
		Hard Pan)	Silt Sand (0.0	1	wal 122 CC mml Ca		
	2.M3) [		1-7	06-2 mm) Òκ; □ □	(22-80 ((((())))	obble (67-249 mm) B	loulder (250 mm) Bedrock
Sub-Dominant Substra	2.M3) [ te (S2.M3) [	10% Minimal (1	1) 10-4	10% Moderate (2	2) 40-60%	High (3)	60% Extreme (4)
Sub-Dominant Substrated to the Rouginess Width Measurement	2.M3) ( te (S2.M3) ( Can't Measu  Feature Width (m	10% Minimal (1 ore (1)	1) 10-4	10% Moderate (:	2) 40-60%		60% Extreme (4)
Sub-Dominant Substrated to the Rouginess Width Measurement Channel Dimensions	2.M3) [ te (S2.M3)	10% Minimal (1 ore (1)		10% Moderate (2	2)	High (3) ->	60% Extreme (4)
Dominant Substrate (S: Sub-Dominant Substrate Feature Rouginess Width Measurement Channel Dimensions Entrenchment To Surface Flow Method	2.M3) ( te (S2.M3) ( Can't Measu  Feature Width (m	10% Minimal (1 me (1)		10% Moderate (i Mean Width Bar	2) 40 60%  (3) Estimate  akfull Depth (mm)  Right Bank	High (3)   > > > > (4)   GIS (5)	60% Extreme (4)  Measure/GIS (6)  widthm
Sub-Dominant Substrated to the Rouginess Width Measurement Channel Dimensions Entrenchment To	2.M3) [ te (S2.M3)	10% Minimal (1 pre (1)	Bankfull (2)  Left Bank Hydraulic Hydraulic head (m	10% Moderate (2)	2)	High (3) >> (5) E	60% Extreme (4)  Measure/GIS (6)  widthm

Point   Project #:   Council Cos   Field Assessment   Sample #1   Sample #2   Sample #2   Point   Petature DATA	ate.	5490	21 Proje				eature Assessmer		Pg 2 of 2 Sample # 3
Site Break   Feature Type   Feature Modifier   Flow Conditions   Feature Vegetation   Riparian Vegetation Dates   One Evidence (4)   Unknown (5)   Valence (3)   Unknown (6)   Valence (4)   Unknown (6)   Valence (5)   Valence (6)   Valence (7)   Valence									
Additional Notes:    Comments	iround	water Indicate	wP#	None Wateron	Height (mm): Height (mm) ass  Seepage	Jumping Jumping	Height (mm) Height (mm)	Other	
Site Break Feature Type Feature Modifier Flow Conditions Feature Vegetation  Trigger Other: Comments  Point Data Ongoing and Active (1) Historic Evidence (2) Reported but No Evidence (3)  Category No Evidence (4) Unknown (5)  POINT DATA KEY:  A Spring/upwelling - estimate <0.5 l/sec, measure temp Seepage area - measure or estimate length of bank where seepage occurs  Watercress - estimate total surface area occupied  Outlet (file or other) - record flow status as per feature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature finet (file or other) - record flow status as per feature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec.  Beaver dam - measure perched height and jumping height  Mammade dam - measure perched height and jumping height  Other barrier to fish movement Potential contamination source (storm sewer outlet or industrial discharge pipe).  Channel hardening - indicated by rip-rap, armour stone, or gabion baskets.  Culvert - note type, size and whether or not perched. If perched record perched height and jumping height.  Flow transition point D/S - flow condition changes from thiminal to substantial surface flow, independent of segment break Flow transition point M/S- flow condition changes from thiminal to substantial surface flow, independent of segment break Flow transition point M/S- flow condition changes from thiminal to substantial surface flow, independent of segment break Flow transition point D/S/F- flow condition changes from thiminal to substantial surface flow, independent of segment break Flow transition point D/S/F- flow condition changes from thiminal to substantial surface flow, independent of segment break Flow transition point D/S/F- flow condition changes from thiminal to substantial surface flow, independent of segment break Flow transition point D/S/F- flow condition changes from thiminal to substantial surface flow, independent of segment break	WP#	Photo #	Code	Category			Description		
Site Break Feature Type Feature Modifier Flow Conditions Feature Vegetation Riparian Vegetation  Trigger Other: Comments  Toint Data Ongoing and Active (1) Historic Evidence (2) Reported but No Evidence (3)  Tategory No Evidence (4) Unknown (5)  OINT DATA KEY:  Spring/upwelling - estimate <0.5 l/sec or >0.5 l/sec, measure temp  Seepage area - measure or estimate length of bank where seepage occurs  Watercress - estimate total surface area occupied  Outlet (file or other) - record flow status as per feature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature  Inlet (file or other) - record flow status as per feature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec.  Beaver dam - measure perched height and jumping height  Manmade dam - measure perched height and jumping height  Other barrier to fish movement  Potential contamination source (storm sewer outlet or industrial discharge pipe)  Channel hardening - indicated by rip-rap, armour stone, or gablon baskets.  Culvert - note type, size and whether or not perched. If perched record perched height and jumping height.  Flow transition point D/S - flow condition changes from dry to standing water, independent of segment break  Flow transition point M/S- flow condition changes from minimal to substantial surface flow, independent of segment break  Flow transition point D/S-flow condition changes from dry/standing water to interstitial flow, independent of segment break									
ite Break   Feature Type   Feature Modifier   Flow Conditions   Feature Vegetation   Riparian Vegetation   rigger   Other: Comments   Dint Data   Ongoing and Active (1)   Historic Evidence (2)   Reported but No Evidence (3)   ategory   No Evidence (4)   Unknown (5)   DINT DATA KEY:  Spring/upwelling - estimate <0.5 l/sec or >0.5 l/sec, measure temp   Seepage area - measure or estimate length of bank where seepage occurs   Watercress - estimate total surface area occupied   Outlet (tile or other) - record flow status as per feature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature   Inlet (tile or other) - record flow status as per feature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec. Beaver dam - measure perched height and jumping height   Manmade dam - measure perched height and jumping height   Other barrier to fish movement   Potential contamination source (storm sewer outlet or industrial discharge pipe). Channel hardening - indicated by rip-rap, armour stone, or gabion baskets   Culvert - note type, size and whether or not perched. If perched record perched height and jumping height.   Flow transition point D/S - flow condition changes from minimal to substantial surface flow, independent of segment break   Flow transition point D/S-flow condition changes from minimal to substantial surface flow, independent of segment break   Flow transition point D-S/F- flow condition changes from dry/standing water to interstitial flow, independent of segment break									
ite Break   Feature Type   Feature Modifier   Flow Conditions   Feature Vegetation   Riparian Vegetation rigger   Other: Comments   Ongoing and Active (1)   Historic Evidence (2)   Reported but No Evidence (3)   ategory   No Evidence (4)   Unknown (5)   OINT DATA KEY:  Spring/upwelling - estimate <0.5 l/sec or >0.5 l/sec, measure temp   Seepage area - measure or estimate length of bank where seepage occurs   Watercress - estimate total surface area occupied   Outlet (tile or other) - record flow status as per feature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature   Inlet (tile or other) - record flow status as per feature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec. Beaver dam - measure perched height and jumping height   Manmade dam - measure perched height and jumping height   Other barrier to fish movement   Potential contamination source (storm sewer outlet or industrial discharge pipe).   Channel hardening - indicated by rip-rap, armour stone, or gabion baskets   Culvert - note type, size and whether or not perched. If perched record perched height and jumping height.   Flow transition point I/S - flow condition changes from minimal to substantial surface flow, independent of segment break   Flow transition point I/S - flow condition changes from dry/standing water to interstitial flow, independent of segment break   Flow transition point D-S/F- flow condition changes from dry/standing water to interstitial flow, independent of segment break   Flow transition point D-S/F- flow condition changes from dry/standing water to interstitial flow, independent of segment break   Flow transition point D-S/F- flow condition changes from dry/standing water to interstitial flow, independent of segment break   Flow transition point D-S/F- flow condition changes from dry/standing water to interstitial flow, independent of segment break   Flow transition point D-S/F- flow condition changes from dry/standing water to interstitial flow, independent of segment break   Flow transition point M-S/F									
Site Break   Feature Type   Feature Modifier   Flow Conditions   Feature Vegetation   Riparian Vegetation   Frigger   Other: Comments   Ot									
Point Data Ongoing and Active (1) No Evidence (4) Unknown (5)  Category No Evidence (4) Unknown (5)  Color DATA KEY:  A Spring/upwelling - estimate <0.5 l/sec or >0.5 l/sec, measure temp Seepage area - measure or estimate length of bank where seepage occurs Watercress - estimate total surface area occupied Outlet (tile or other) - record flow status as per feature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature Inlet (tile or other) - record flow status as per feature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec. Beaver dam - measure perched height and jumping height Manmade dam - measure perched height and jumping height Other barrier to fish movement Potential contamination source (storm sewer outlet or industrial discharge pipe). Channel hardening - indicated by rip-rap, armour stone, or gabion baskets. Culvert - note type, size and whether or not perched. If perched record perched height and jumping height. Flow transition point D/S - flow condition changes from dry/standing water, independent of segment break Flow transition point D-S/IF- flow condition changes from dry/standing water to interstitial flow, independent of segment break								on 🔲 Ripar	īan Vegetation
Spring/upwelling - estimate < 0.5 l/sec or > 0.5 l/sec; measure temp Seepage area - measure or estimate length of bank where seepage occurs Watercress - estimate total surface area occupied Outlet (tile or other) - record flow status as per feature flow. Estimate volume < 0.5 l/sec or > 0.5 l/sec. Measure temperature Inlet (tile or other) - record flow status as per feature flow. Estimate volume to be < 0.5 l/sec or > 0.5 l/sec. Beaver dam - measure perched height and jumping height Manmade dam - measure perched height and jumping height Other barrier to fish movement Potential contamination source (storm sewer outlet or industrial discharge pipe). Channel hardening - indicated by rip-rap, armour stone, or gabion baskets. Culvert - note type, size and whether or not perched. If perched record perched height and jumping height. Flow transition point D/S - flow condition changes from dry to standing water, independent of segment break Flow transition point D/S-flow condition changes from minimal to substantial surface flow, independent of segment break Flow transition point D-S/IF-flow condition changes from dry/standing water to interstitial flow, independent of segment break	oint l	Data		Ongoing and Active (1			2) Reported but No	Evidence (3)	
Potential nutrient source Dredging of channel	A B C D E F G H J K J M N D C	Spring/upwell Seepage area Watercress - Outlet (tile or Inlet (tile or ot Beaver dam - Manmade dar Other barrier Potential cont Channel hard Culvert - note Flow transition	a - measure or estimate total a other) - record finesure perconn - measure perconn - measure perconn - measure perconn - indication sour ening - indication point D/S - fine point M/S- ficen point D-S/IF-1 during non-fisent source	estimate length of bank visurface area occupied flow status as per feature ow status as per feature is the height and jumping herched height and jumping herched height and jumping ent roce (storm sewer outlet or ed by rip-rap, armour stord whether or not perched ow condition changes from flow condition changes from flow condition changes from flow condition changes from the status area of t	where seepage occurs  e flow. Estimate volume flow. Estimate volume to eight g height industrial discharge pip fie, or gabion baskets. If perched record perch in dry to standing water, in minimal to substantial	be <0.5 l/sec of the control of the	or >0.5 l/sec.  umping height.  f segment break independent of segment br	eak	

Flow Condition	Stream Code:	Site Code: Field Assessment.	J Monsell  SMO-WCD-AB  D Sample 1 Unconnected HDF:
Downstream  Direction of Assessment:  Flow Influence	ream WP#  Upstream D		
Flow Condition  Feature Type  CH  Feature Vegetation  O-1.5 m Left Bank None (1) Right Bank Channel Gradient (S4.M7)  Distance (m):  Channel Gradient Substrate (S2.M3)  Feature Roughness Width Measurement Can't M  Channel Dimensions Feature Width  Entrenchment Total:		or risks (for take)	☐ Sample 2 ☐ Not connected
Flow Condition	J Freshet (1)	ownstream	Sample 3 to downstream network
Feature Type		☐ Spate (2)	Baseflow (3)
Feature Type	Dry (1) Standing Water (2)	☐ Interstitial Flow (3) ☐ Minimal Flow (4)	☐ Substantial Flow (5)
Riparian Vegetation  0 - 1.5 m Left Bank None (1) Right Bank None (1)  1.5 - 10 m Left Bank None (1) Right Bank None (1)  10 - 30 m Left Bank None (1) Right Bank None (1) Right Bank None (1)  Channel Gradlent (S4.M7)  Distance (m):  Ci  Dominant Substrate (S2.M3)  Sub-Dominant Substrate (S2.M3)  Feature Roughness Width Measurement Can't M  Channel Dimensions Feature Widt  Entrenchment Total:		☐ No Defined Feature (4) ☐ Tiled Feature (5) ☐ Wetland (6)	Swale (7) Roadside Ditch (8) Pond (9)
Dominant Substrate (S2.M3)  Left Bank None (1) Right Bank None (1)	oe (1)	☐ Meadow (4) ☐ Scrubland	(5) Wetland(6) Forest (7)
Right Bank None (1 10 - 30 m Left Bank None (1 Right Bank None (1 Channel Gradient (S4.M7) Vis Distance (m):  Ci Dominant Substrate (S2.M3) Sub-Dominant Substrate (S2.M3)  Feature Roughness Width Measurement Can't M Channel Dimensions Feature Widt Entrenchment Total:		☐Meadow (4) ☐ Scrubland (5	
Right Bank None (1  Channel Gradient (S4.M7) Vis  Distance (m):  Ci  Dominant Substrate (S2.M3)  Sub-Dominant Substrate (S2.M3)  Feature Roughness Width Measurement Can't M  Channel Dimensions Feature Widt  Entrenchment Total:		☐ Meadow (4) ☐ Scrubland ☐ Meadow (4) ☐ Scrubland	
Distance (m):  Ci Dominant Substrate (S2.M3)  Sub-Dominant Substrate (S2.M3)  Feature Roughness Width Measurement	one (1)	☐ Meadow (4) ☐ Scrubland ☐ Meadow (4) ☐ Scrubland	
Width Measurement	Clay (Hard Pan) Sitt Sand (0.0	6-2 mm) Gravel (22-66 mm) Cot	oble (67-249 mm) Boulder (250 mm) Bedrool
Entrenchment Total: ->		0% Moderate (2) 40 - 80% Mean Width (3) Estimated	High (3)
		Bankfull Depth (mm)	1
Surface Flow Method Perched	→ 40 m	m Right Bank	m Total width m
	erched Culvert (1) Hydraulic	Head (2) Distance by Tir	ne (3) Estimated (4)
1			Distance (m) Time (s) 1 2 3 1 2
Ule U	nla	_	
Adjacent Sediment Transport Feature	☐ Sheet Erosion (6)	☐ Instream Bank Erosion (7)	Gully (4)

		3						☐ Sample # 2	Sample # 3
ich Ra	rrier Measuren	nents: WP#		Perched Height		URE DAT	Height (mm)		
ian Da	nici measuren	WP#			1	Jumping 1			
round	water Indicate	, D			A COLOR		Stained	Domer	
	llection			Present		- Budbing	— Starred	Outst	
			377-10-	1. 1005(1)	Comment				
WP#	Photo#	Code	Catagoni				Description		
****	FIIOIO#	Code	Category				Description		
			-						
-									
Site B	_	Feature Typ		ture Modifier	Flow	Conditions	☐ Feature Veg	etation	parian Vegetation
Trigge		Other: Cor		A - 6: 741	Ulata	da Fuldania (0)	Deported by	I No Cuidonos (2)	
Point I			Ongoing and No Evidence			ric Evidence (2) own (5)	Reported bu	I No Evidence (3)	
Catego	DATA KEY:		NO EVIDENCE	(4)	Ulki	OWIT (3)			
H (	Seepage are: Watercress - Outlet (tile or Inlet (tile or of Beaver dam - Manmade dan Other barrier Potential cont Channel hard Culvert - note Flow transitio	a - measure or estimate total other) - record ther) - record measure per m - measure per to fish movem tamination sou ening - indical type, size and n point D/S - f	flow status as per ched height and jourched height ar nent urce (storm sewer ted by rip-rap, and d whether or not low condition challow condition challow	of bank where so cupied her feature flow. Es umping height and jumping height routlet or industration mour stone, or greeperched. If perchanges from dry to anges from minim	eepage occurs Estimate volume to timate volume tima	pe).  ned height and jui, independent of I surface flow, inc	mping height.	ent break	

Date: July 3	1606/	Proje	a# \60410	305	Recorder/Crew	J. Marel	1
Stream Name:	3,000		m Code	2005	Site Code	5MD-W	
lite Limits:	Upstream	WP#	-		Field Assessment:	☐ Sample 1	Unconnected HDF
	Downstream	WP#				☐ Sample 2	□ Not connected
Pirection of Assessment		Upstr.	eam 🔲 D	ownstream		Sample 3	to downstream networ
low Influence	☐ Fresh	et (1)		☐ Spate	(2)	■ Base	flow (3)
low Condition	Dry (1	i) ling Water (2)			titial Flow (3) al Flow (4)	☐ Subs	tantial Flow (5)
eature Type	☐ Define	ed Natural Chan nelized or Const		☐ No De	efined Feature (4) Feature (5)	☐ Swale ☐ Road ☐ Pond	Iside Ditch (8)
eature Vegetation		Lawn (2)	Cropped (3)		ow (4) Scrublar		6)  Forest (7)
Riparian Vegetation	1						
-1.5 m Left Bank Right Bank	□None (1) None (1)	Lawn (2) Lawn (2)	Cropped (3) Cropped (3)	☐ Meadow	(4) Scrubland ow (4) Scrublan		
.5 - 10 m Left Bank Right Bank		☐ Lawn (2) ☐ Lawn (2)	☐ Cropped (3) ☐ Cropped (3)		ow (4) Scrublar		
0 - 30 m Left Bank Right Bank	□ None (1) □ None (1)	☐ Lawn (2) ☐ Lawn (2)	☐ Cropped (3) ☐ Cropped (3)		ow (4) Scrublar		
Distance (m):	_	-	eter (2) Stase		Survey Level (4)	Other (5)  Gradient	☐ LiDAR (6) (%):
Dominant Substrate (S	52.M3)	(Hard Pan)	Elevation (cm	1		Gradient	
Dominant Substrate (S Sub-Dominant Substra	s2.M3) ate (S2.M3)		Silt Sand (0.0	): )6-2 mm) G	ravel (22-66 mm) C	Gradient obble (67-249 mm) B	(%): loulder (250 mm) Bedroc
Dominant Substrate (S Sub-Dominant Substra Feature Roughness	ate (\$2.M3)	< 10% Minimal (	Elevation (cm.	1	ravel (22-66 mm) C	Gradient (obble (67-249 mm) B	(%):
Dominant Substrate (S Sub-Dominant Substrate Feature Roughness Width Measurement	ate (\$2.M3)	< 10% Minimal (	Elevation (cm.	16-2 mm) G	ravel (22-66 mm) C	Gradient (obble (67-249 mm) B	(%):
Dominant Substrate (S Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions	ate (S2.M3)	< 10% Minimal ( sure (1)	Silt Sand (0.0	0% Moderate Mean Wid	(22-66 mm) C	Gradient obble (67-249 mm) B	(%):
Dominant Substrate (S Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions	ate (\$2.M3)  Line (\$2.M3)  Can't Meas  Feature Width (r	< 10% Minimal ( sure (1)	Silt Sand (0.0	0% Moderate Mean Wid	(22-66 mm) C (2)	Gradient obble (67-249 mm) B  Gradie	ioulder (250 mm) Bedrood Bedro
Dominant Substrate (S Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions	Can't Meas  Feature Width (rotal:	< 10% Minimal ( sure (1)	Silt Sand (0.0	): Ge-2 mm) Ge-2 mm Ge-2 mm) G	ravel (22-66 mm) C  (2)	Gradient obble (67-249 mm) B  Gradie	ioulder (250 mm) Bedroc

olo:	71.0	n Proin		Headwater Drainage F		Pg 2 of 2 ample ≠ 2 Sample ≠ 3
ale:	sort ac	1 HOLE		POINT FEATURE DA		amper 2
round	rier Measuren water Indicato lection	WP#	Perched He Perched He		ng Height (mm) ng Height (mm):	ther
WP#	Photo#	Code	Category		Description	
Additi	onal Notes		+ No Hace =	ochs + vegelalia	X;	
Site Br Trigge	r 🗆	Feature Typ Other: Cor	mments			Riparian Vegetation
Point I Catego			Ongoing and Active (1) No Evidence (4)		(2) Reported but No Evi	dence (3)
A B C D E F G H I J K L M N	Seepage are: Watercress - Outlet (tile or or Inlet (tile or or Beaver dam - Manmade dar Other barrier Potential cont Channel hard Culvert - note Flow transitio Flow transitio Flow transitio	a - measure or estimate total other) - record ther) - record the measure per manifer a more more manifer a more more more more more more more more	flow status as per feature flow ched height and jumping heig perched height and jumping hent urce (storm sewer outlet or inc ted by rip-rap, armour stone, d whether or not perched. If p flow condition changes from of low condition changes from re	ere seepage occurs  ow, Estimate volume <0.5 l/sec or  v. Estimate volume to be <0.5 l/sec  ght  neight  dustrial discharge pipe).	c or >0.5 l/sec  I jumping height, of segment break independent of segment break	

Date: July 30	2021	Projec	# 10041 o	995 RE	coorder/Crew	J March T	
Stream Name.			n Code:		e Code	5MD-40	2-01
Site Limits:	Upstream Downstream	WP# WP#		Fit	eld Assessment	☐ Sample 1 ☐ Sample 2	Unconnected HDF  ☐ Not connected
Direction of Assessment		■ Upstre	eam D	ownstream		Sample 3	to downstream netwo
low Influence	☐ Freshe	1(1)		☐ Spate (2)		■ Base	flow (3)
Flow Condition	Dry (1)	ng Water (2)		☐ Interstitial I		☐ Subst	tantial Flow (5)
Feature Type		d Natural Channelized or Constr hread (3)		☐ No Defined ☐ Tiled Featu ☐ Wetland (6	ire (5)	☐ Swale ☐ Road ☐ Pond	side Ditch (8)
Feature Vegetation	None (1)	☐ Lawn (2)	Cropped (3)		Scrublar		i) D Forest (7)
0 - 1.5 m Left Bank Right Bank	□None (1) □ None (1)	DLawn (2) Lawn (2)	☐ Cropped (3) ☐ Cropped (3)	☐ Meadow (4) ☐ Meadow (4)			☐ Forest (7)  ☐ Forest (7)
1.5 - 10 m Left Bank Right Bank		□ Lawn (2)	☐ Cropped (3) ☐ Cropped (3)		Scrublar Scrublar	The second secon	4
10 - 30 m Left Bank Right Bank		☐ Lawn (2) ☐ Lawn (2)	☐ Cropped (3) ☐ Cropped (3)	The second secon	Scrublar  Scrublar		A CONTRACTOR OF THE PARTY OF TH
1	-		Elevation (cm)			Gradient (	%):
Dominant Substrate (S	2.M3)	Hard Pan)		1	(22-66 mm) C		
Dominant Substrate (S. Sub-Dominant Substrat	2.M3) [ te (S2.M3) [	10% Minimal (	Silt Sand (0.0	1	1 28-60%	obble (67-249 mm) B	
Dominant Substrate (S. Sub-Dominant Substrate Substrate Feeture Roughness Width Measurement	2.M3) [ te (S2.M3)	10% Minimal (	Silt Sand (0.0	6-2 mm) Gravel 0% Moderate (2) Mean Width (3	1 28-60%	obble (67-249 mm) B	oulder (250 mm) Bedroo
Dominant Substrate (S. Sub-Dominant Substrate Substrate Feature Roughness Width Measurement Channel Dimensions	2.M3) [ te (S2.M3) ]   Can'l Measu	10% Minimal (	Silt Sand (0.0	6-2 mm) Gravel 0% Moderate (2) Mean Width (3	Depth (mm)	obble (67-249 mm) B	oulder (250 mm) Bedroo
Surface Flow Method Wetted Width (m)	z.M3) [ te (S2.M3)   Can't Measure Width (mass.   240 m  Perched Cul  Wetted Dep	10% Minimal (* ure (1)	Silt Sand (0.0	6-2 mm) Gravel  0% Moderate (2)  Mean Width (3  Banktu  m Right	Depth (mm)  ght Bank  Distance by 7	obble (67-249 mm) B  High (3)	oulder (250 mm) Bedroc  Graph Government Bedroc  Graph Government Bedroc  Graph Government Bedroc  Graph Bedroc  G
Dominant Substrate (S: Sub-Dominant Substrat Feeture Roughness Width Measurement Channel Dimensions Entrenchment To Surface Flow Method	te (S2.M3)  Can't Measu  Feature Width (mastal: 240 m  Perched Cul  Wetted Dep	10% Minimal (* ure (1)	Silt Sand (0.0	6-2 mm) Gravel  0% Moderate (2)  Mean Width (3  Banktu  m Right  Head (2)  Volum	Depth (mm)  ght Bank  Distance by 7	obble (67-249 mm) B  High (3)	oulder (250 mm) Bedroc  60% Extreme (4)  Measure/GIS (6)  widthm  Estimated (4)  Time (s)

)ala: ~	24130	On Drois		Strained Headwater Drainage Feature Assessment Pg. 2 of 2  ALGOS Field Assessment: Sample # 1 Sample # 2 Sample # 3
Jaic.	201 20	(3) Froje	W#. (QO	(10.11) Tield Assessment — Sample & F.
Ground	rrier Measurer water Indicat Hection	ors 🔲	None	POINT FEATURE DATA  Perched Height (mm):
WP#	Photo #	Code	Category	Description
Addit	ional Notes		* /	of Hoo
Site B Trigge Point Categ	or 🗆 Data	Feature Typ Other: Cor	nments Ongoing and A No Evidence (	Active (1) Historic Evidence (2) Reported but No Evidence (3)
POINT ABCDEFGHIJKLMNOPQR	Seepage are Watercress - Outlet (tile or Inlet (tile or of Beaver damandament Manmade da Other barrier Potential con Channel hard Culvert - note Flow transitio Flow transitio	a - measure of estimate total other) - record ther) - record ther) - record ther) - measure per measure indical type, size and no point D/S - fin point M/S- fin point D-S/IF diduring non-fitent source	r estimate length of surface area occidiflow status as per ched height and juderched height and perched height and lent area (storm sewer led by rip-rap, arm distribution chairs ow condition chairs area occurred to the condition chairs are area of the condition chairs area occurred to the condition chairs are area occurred to the condition chairs area occurred to the condition chairs are area.	refeature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature.  feature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec.  umping height  d jumping height  outlet or industrial discharge pipe).  nour stone, or gabion baskets.  perched. If perched record perched height and jumping height.  nges from dry to standing water, independent of segment break  nages from minimal to substantial surface flow, independent of segment break  hanges from dry/standing water to interstitial flow, independent of segment break