Geomatics and Digital Solutions to Support Field Planning, Data Collection, Collaboration, Reporting

A Case Study from AltaLink 716L Soil Salvage Assessment

Matt Wilkinson, MGIS
Senior GIS Analyst

October 17th, 2024

Acknowledgements

SAMSON CREE NATION

ERMINESKIN CREE NATION

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Agenda

- Project Introduction
- Configuring a Solution
- Spatial Analysis for Sampling Design
- Mobile Data Collection
- Collaboration and Reporting
- Closing Remarks

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Project Introduction

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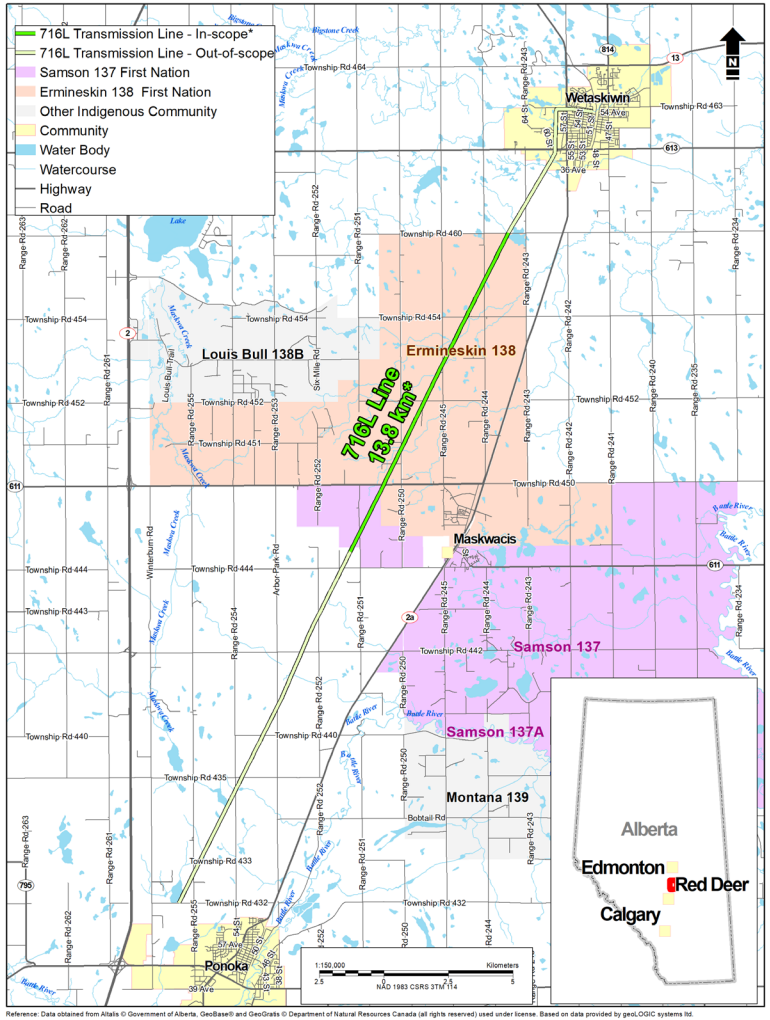
Geographic Context

- AltaLink 716L Transmission Line
- Between Ponoka and Wetaskiwin on Samson 137 and Ermineskin 138 First Nations
- 60 Structures (two poles per structure, some ghost poles)
- Segment through Samson & Ermineskin Nations: 13.8 km



Contaminants of Concern

- Historic Pentachlorophenol (PCP) or creosote use to treat wooden power poles
- Primary contaminants of concern (CoCs) PCP, dioxins and furans (PCDD/Fs)
- Secondary CoCs: polycyclic aromatic hydrocarbons (PAHs) and boron

Phase of the Project

- Soil Salvage Assessment ☑
- Remedial Action Plan ☑
- Remediation ⏳

Configuring a Solution

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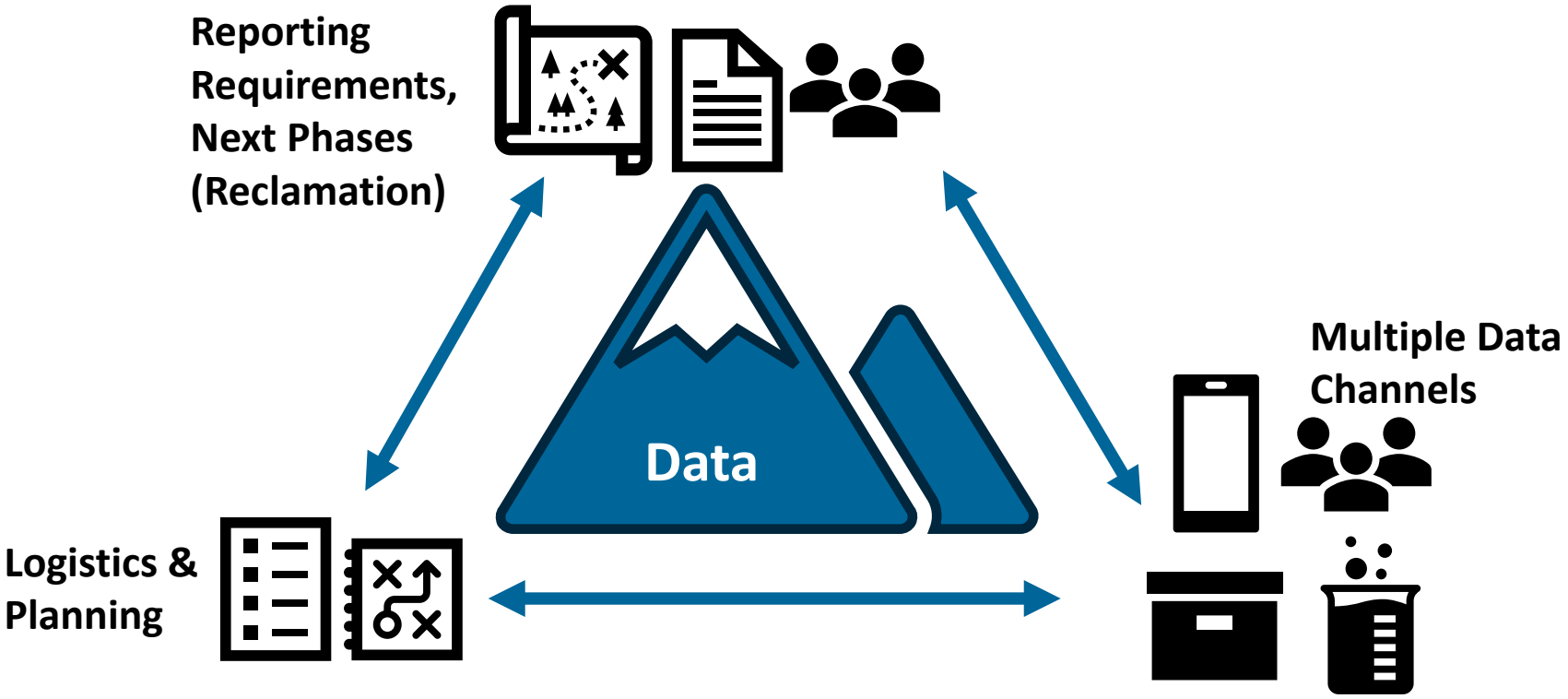
Scaling the Mountain



Strategize and Maximize

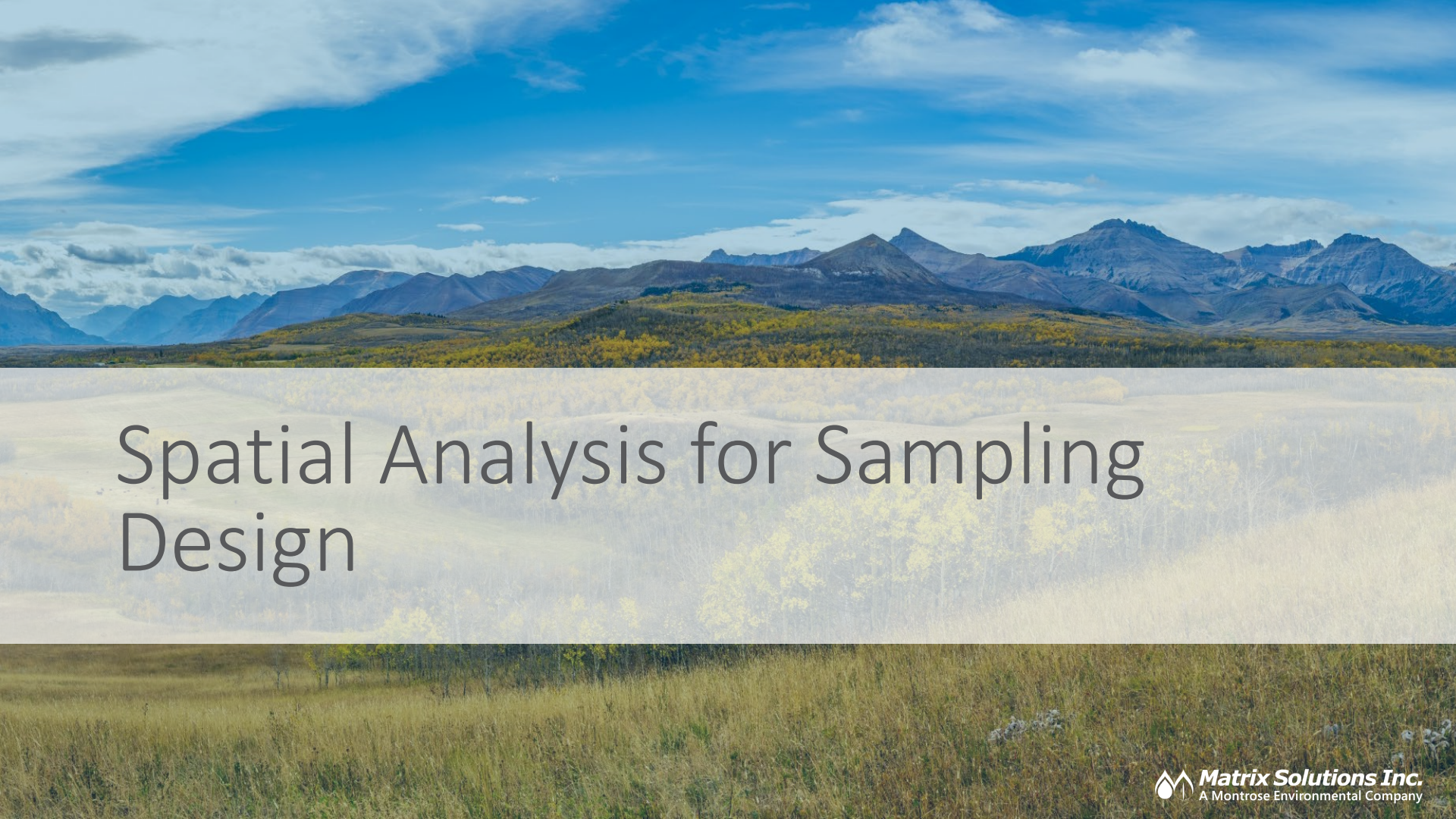
- Large number of samples (>1000s)
- Geographically large (>10km)
- Collaboration with client
- Leverage data for remediation scoping
- **Investment to collecting lots of data – how can we maximize this investment using geomatics and digital solutions?**
- **Defining Collaboration**

Scoping It Out

Understanding and Building Data Structure

Off-The-Shelf Applications

Making It Right-Sized



Spatial Analysis for Sampling Design

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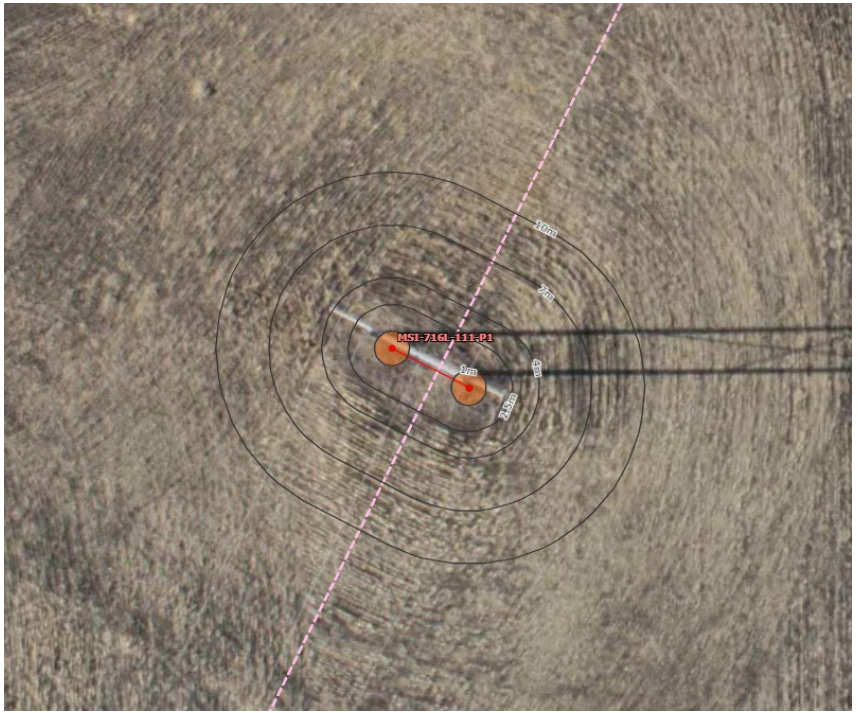
What is a structure? How do we sample?



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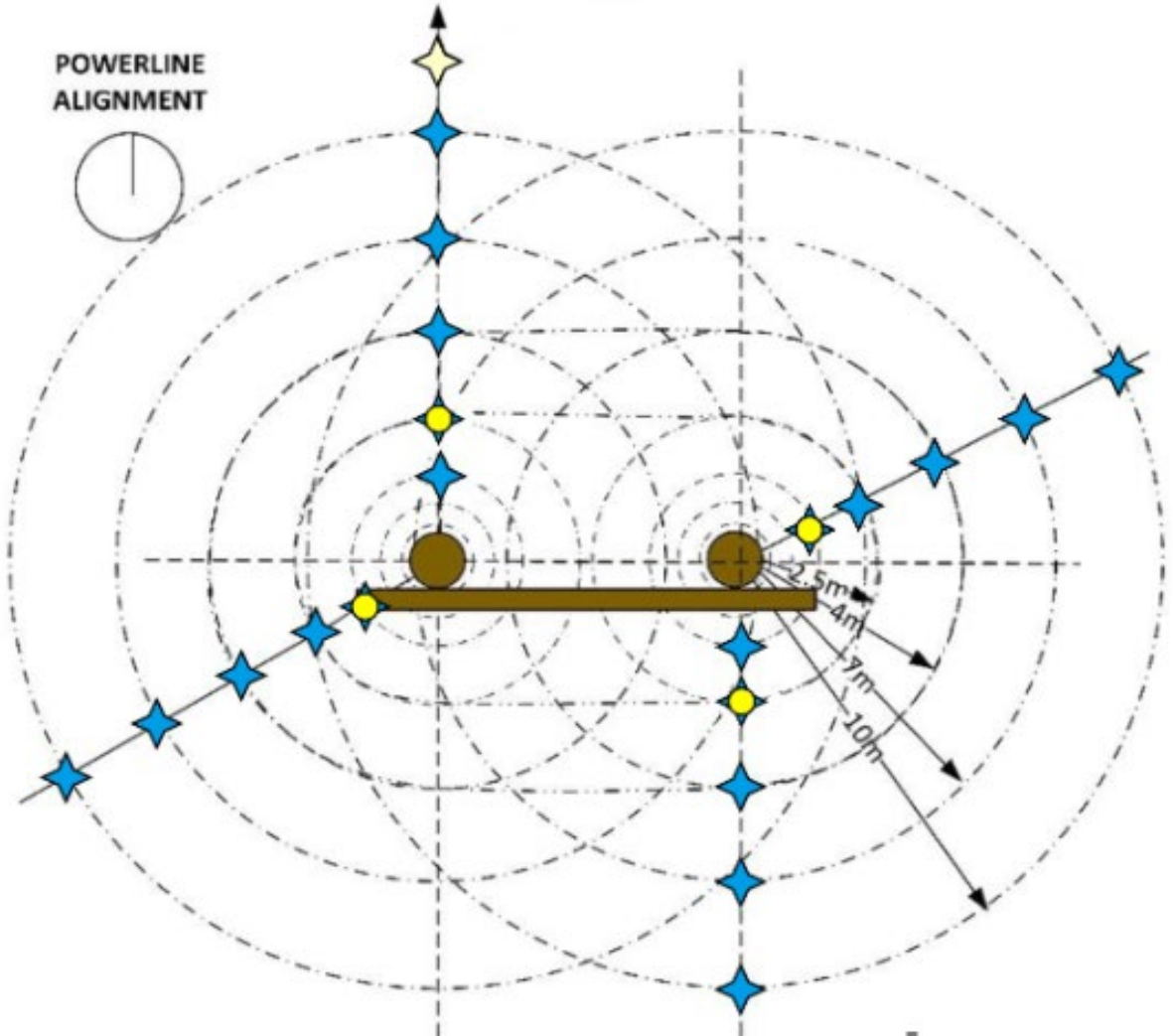


H-FRAME SAMPLING CONCEPT LEGEND:

Composite PCDD/F Hand Sampling:

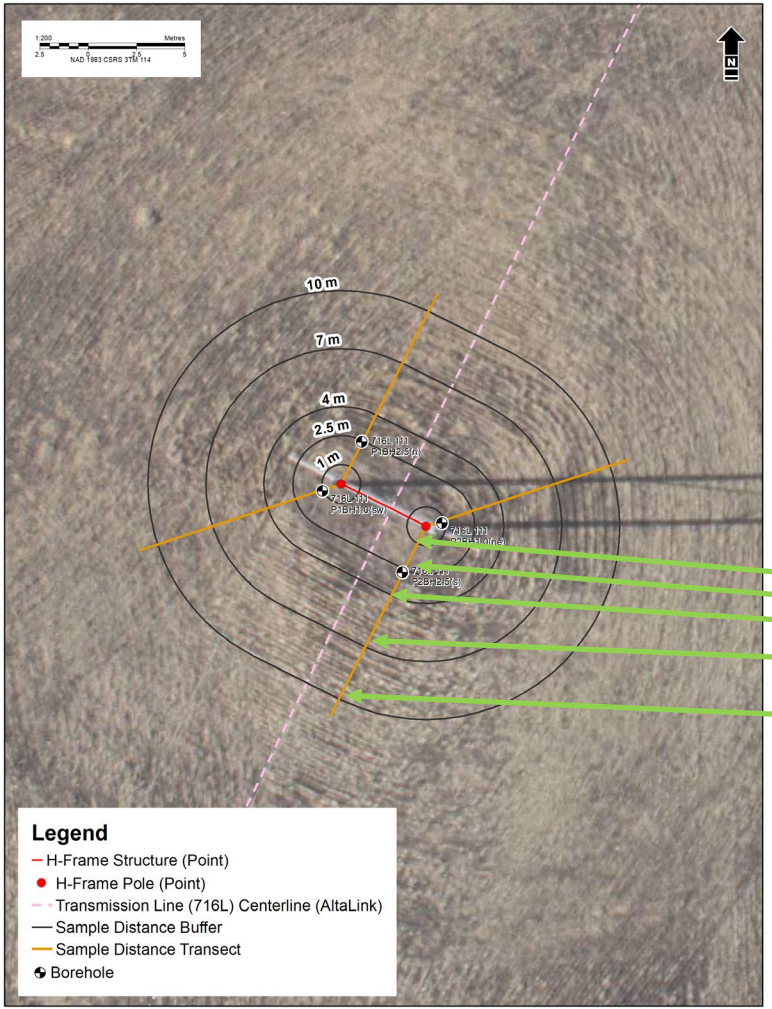
- 4 x sub-samples per radial distance = 1 x composite
- Sub-sample depths: 0 to 0.15 and 0.15 to 0.3 m bgs
- 1 x composite per radial distance
- 5 x composites per depth interval
- 10 x composites per structure

Discrete PCP, PAH, PCDD/F Sampling:

- 2 x boreholes at 1 m radial distance to 6 m bgs
- 2 x boreholes at 2.5 m radial distance to 3 m bgs

Background PCDD/F Sampling:

- 1 x composite sample from 0 to 0.15 m bgs
- Mid-span location within RoW
- 1 x sample per 10 structures



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Mobile Data Collection

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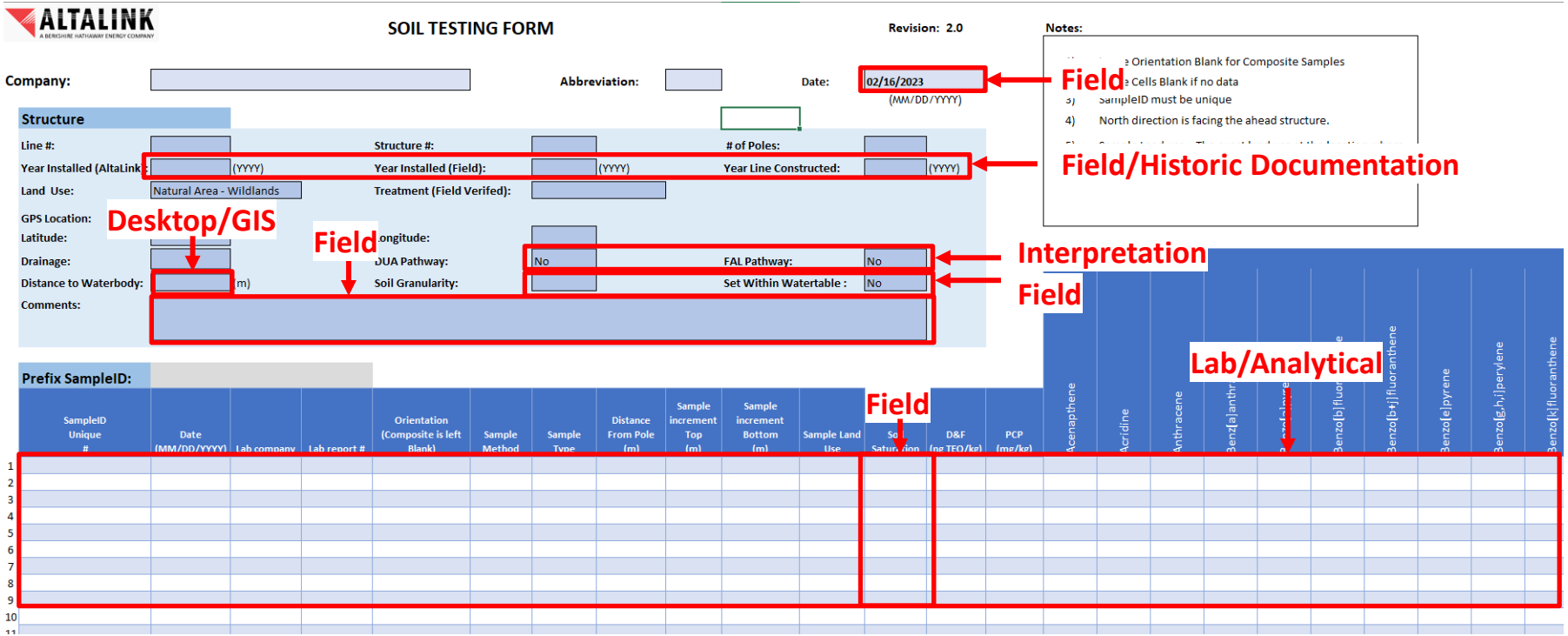
Data Reporting Requirements



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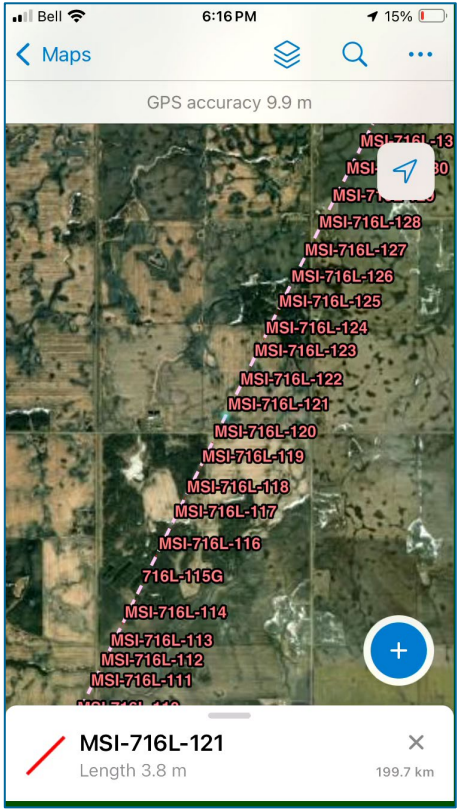
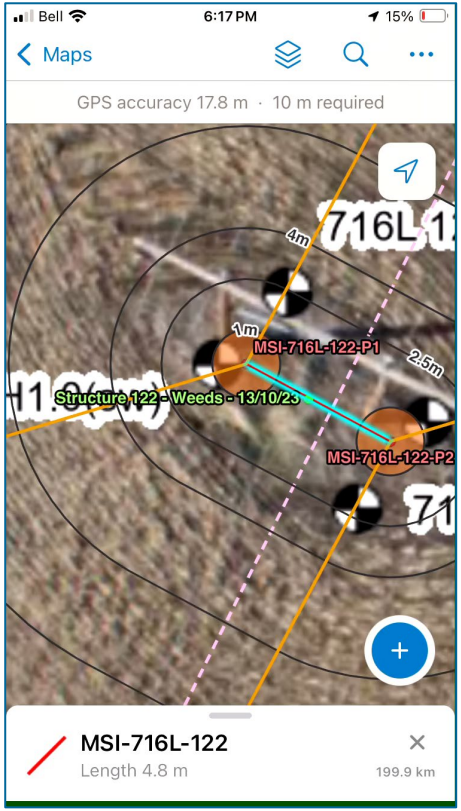
Translating to Collection





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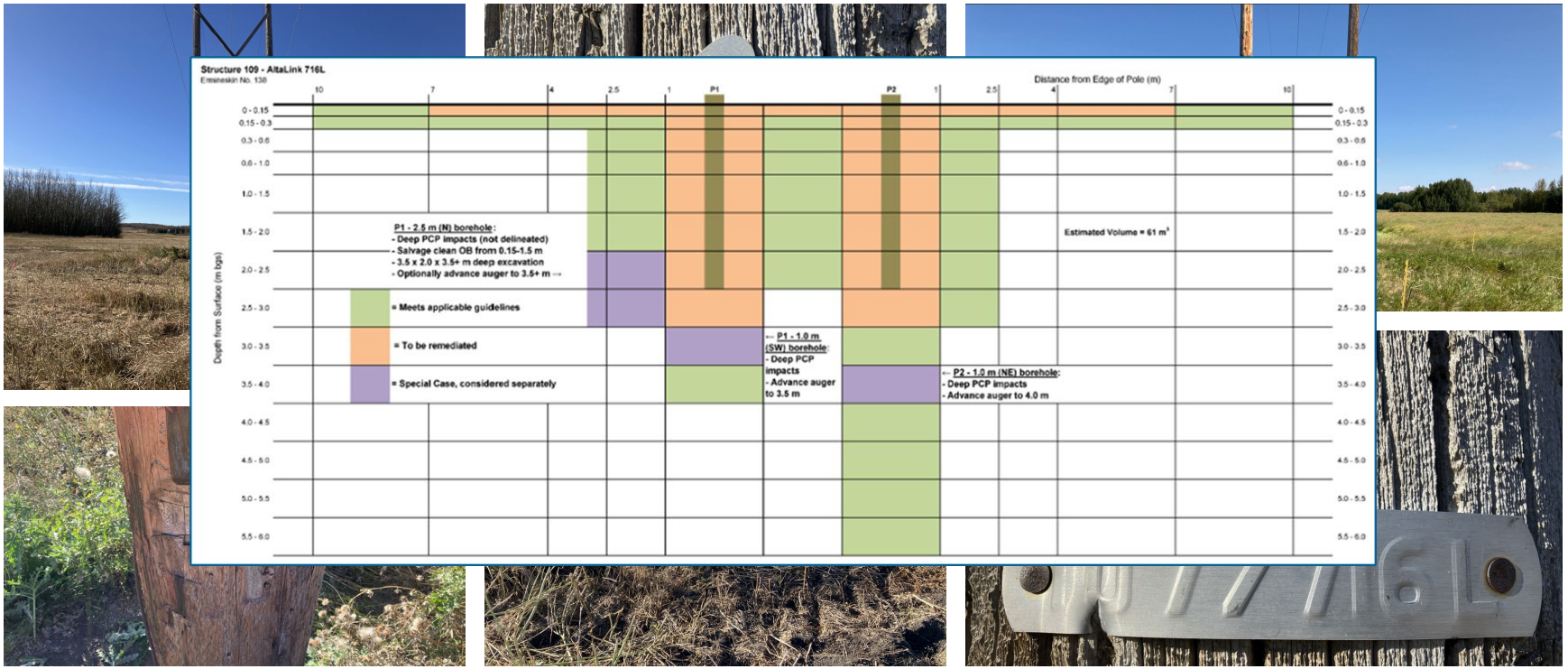
Photo, Photos, Photos, Sections



Office-Field Collaboration

Collaboration and Reporting

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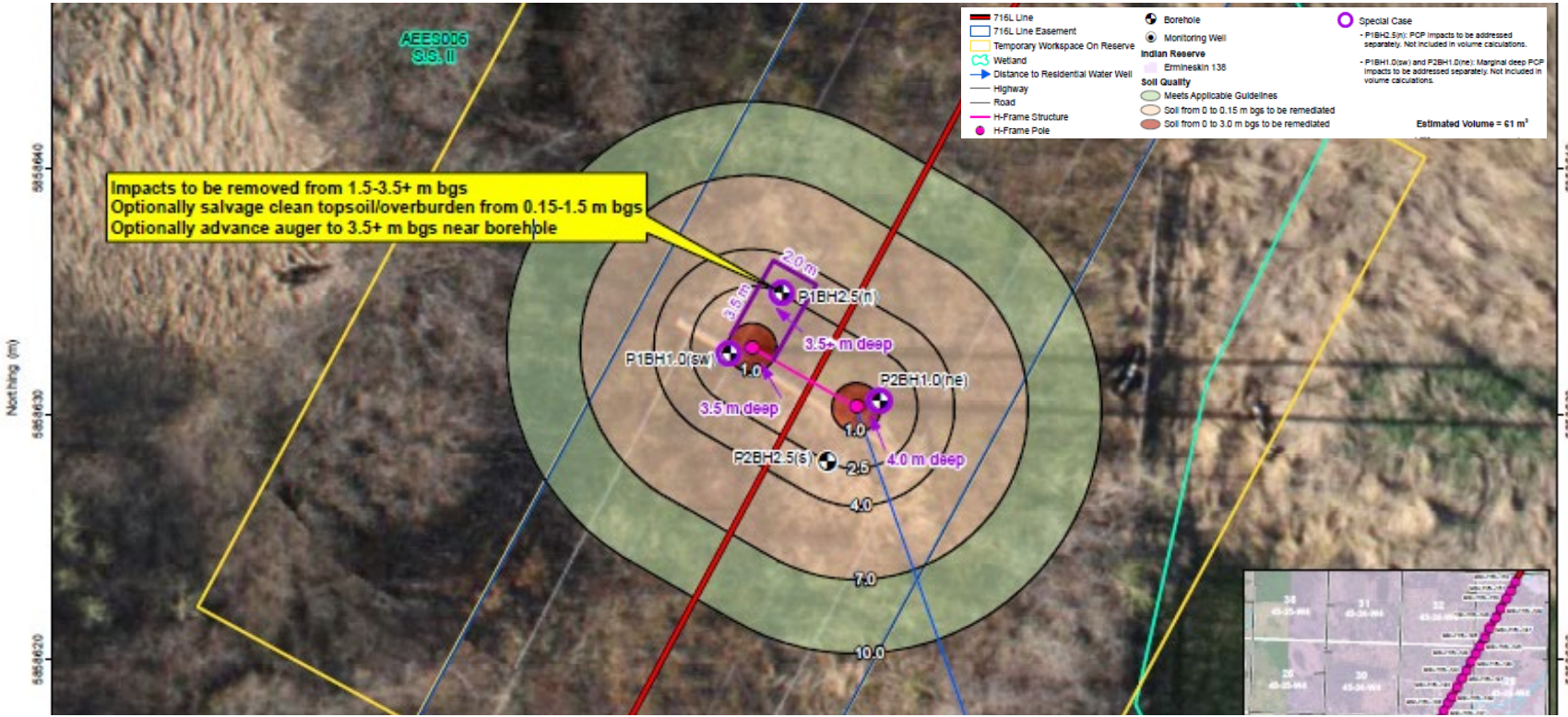
How Do We Want To Map This?



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Semi-Automated Reporting

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SOIL TESTING FORM

Revision: 2.0

Company: Matrix Solutions Incorporated **Abbreviation:** MSI **Date:** 10/21/2023 (MM/DD/YYYY)

Structure

Line #:	716L	Structure #:	125	# of Poles:	2
Year Installed (AltaLink):	1951 (YYYY)	Year Installed (Field):	1951 (YYYY)	Year Line Constructed:	1951 (YYYY)
Land Use:	Natural Area - Wildlands	Treatment (Field Verifed):	Creosote		
GPS Location:					
Latitude:	52.880699	Longitude:	-113.46673		
Drainage:	South	DUA Pathway:	Yes	FAL Pathway:	Yes
Distance to Waterbody:	358 (m)	Soil Granularity:	Fine Grain	Set Within Watertable :	No

Comments: Distance to nearest water well not field verified, measured to nearest residence. Fine-grained clay overlies silt at approximately 1.5 m. Structure

Notes:

1) Leave Orientation Blank for Composite Samples
2) Leave Cells Blank if no data
3) SampleID must be unique
4) North direction is facing the ahead structure.
5) Sample Land use = The exact land use at the location where the sample was collected, which may differ from structure land use.

Prefix SampleID: MSI716L125

	SampleID Unique #	Date (MM/DD/YYYY)	Lab company	Lab report #	Orientation (Composite is left Blank)	Sample Method	Sample Type	Distance From Pole (m)	Sample increment Top (m)	Sample increment Bottom (m)	Sample Land Use	Soil Saturation	D&F (ng TEQ/kg)	PCP (mg/kg)	Acenapthene	Acridine	Anthracene	Benz[a]anthracene	Benzo[a]pyrene	Benzo[b]fluoranthene	Benzo[b+j]fluoranthene	Benzo[e]pyrene	Benzo[g,h,i]perylene
1	MSI-716L-125-HA1.0(C)(0-0.1	10/12/2023	AGAT	23E083132		Shovel	Composite	1.0	0	0.15	Natural Area	Unsaturated	0.968	<0.005	<0.005	<0.05	0.0310	0.1100	0.1300		0.4300	0.2200	0.1000
2	MSI-716L-125-HA1.0(C)(0.15	10/12/2023	AGAT	23E083132		Shovel	Composite	1.0	0.15	0.3	Natural Area	Unsaturated	0.421	<0.005	<0.005	<0.05	0.0400	0.1000	0.1100		0.3600	0.1900	0.0900
3	MSI-716L-125-HA2.5(C)(0-0.1	10/12/2023	AGAT	23E083132		Shovel	Composite	2.5	0	0.15	Natural Area	Unsaturated	0.258	<0.005	<0.005	<0.05	<0.004	<0.02	<0.03		0.0400	<0.05	<0.05
4	MSI-716L-125-HA2.5(C)(0-0.1	10/12/2023	AGAT	23E083132		Shovel	Composite	2.5	0	0.15	Natural Area	Unsaturated	0.166	<0.005	<0.005	<0.05	0.0340	0.1000	0.1200		0.3200	0.1600	0.0700
5	MSI-716L-125-HA2.5(C)(0.15	10/12/2023	AGAT	23E083132		Shovel	Composite	2.5	0.15	0.3	Natural Area	Unsaturated	0.0417										
6	MSI-716L-125-HA4.0(C)(0-0.1	10/12/2023	AGAT	23E083132		Shovel	Composite	4.0	0	0.15	Natural Area	Unsaturated	0.335	<0.005									
7	MSI-716L-125-HA7.0(C)(0-0.1	10/12/2023	AGAT	23E083132		Shovel	Composite	7.0	0	0.15	Natural Area	Unsaturated	0.216										

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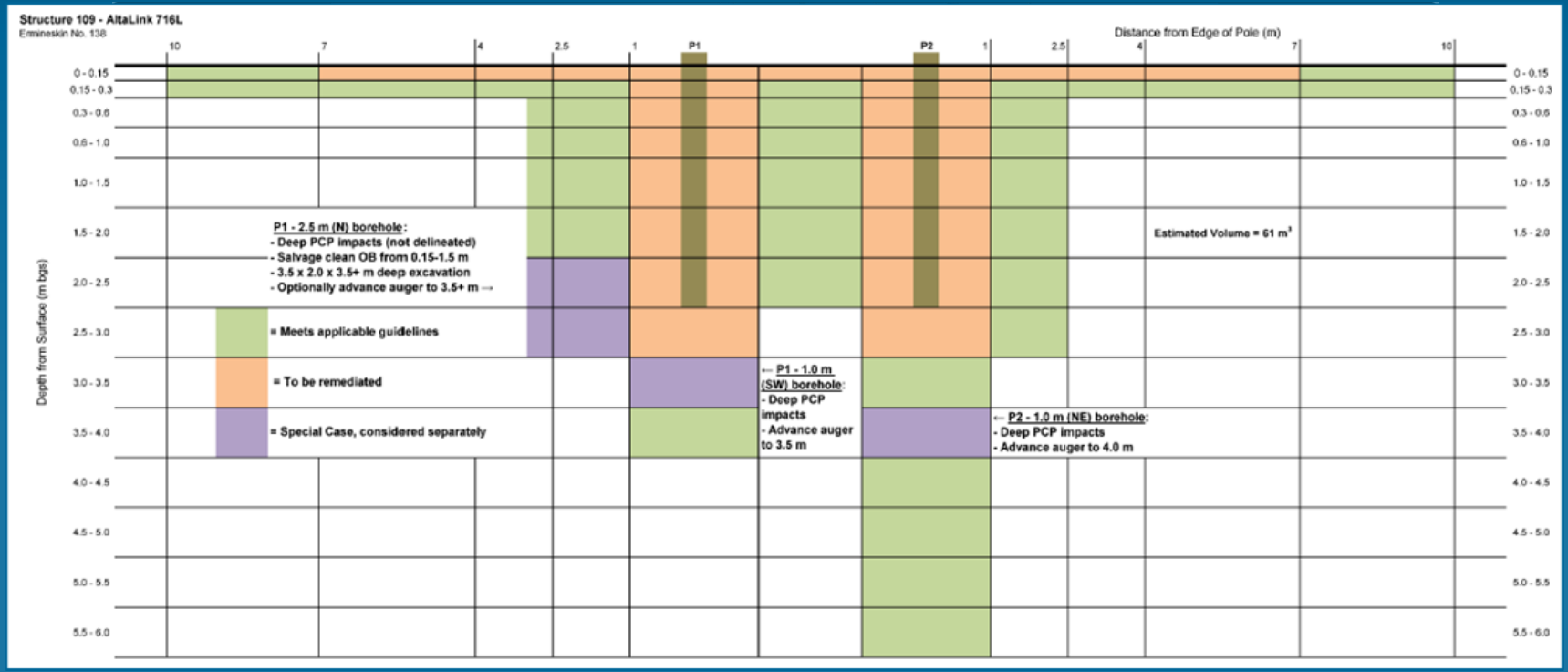
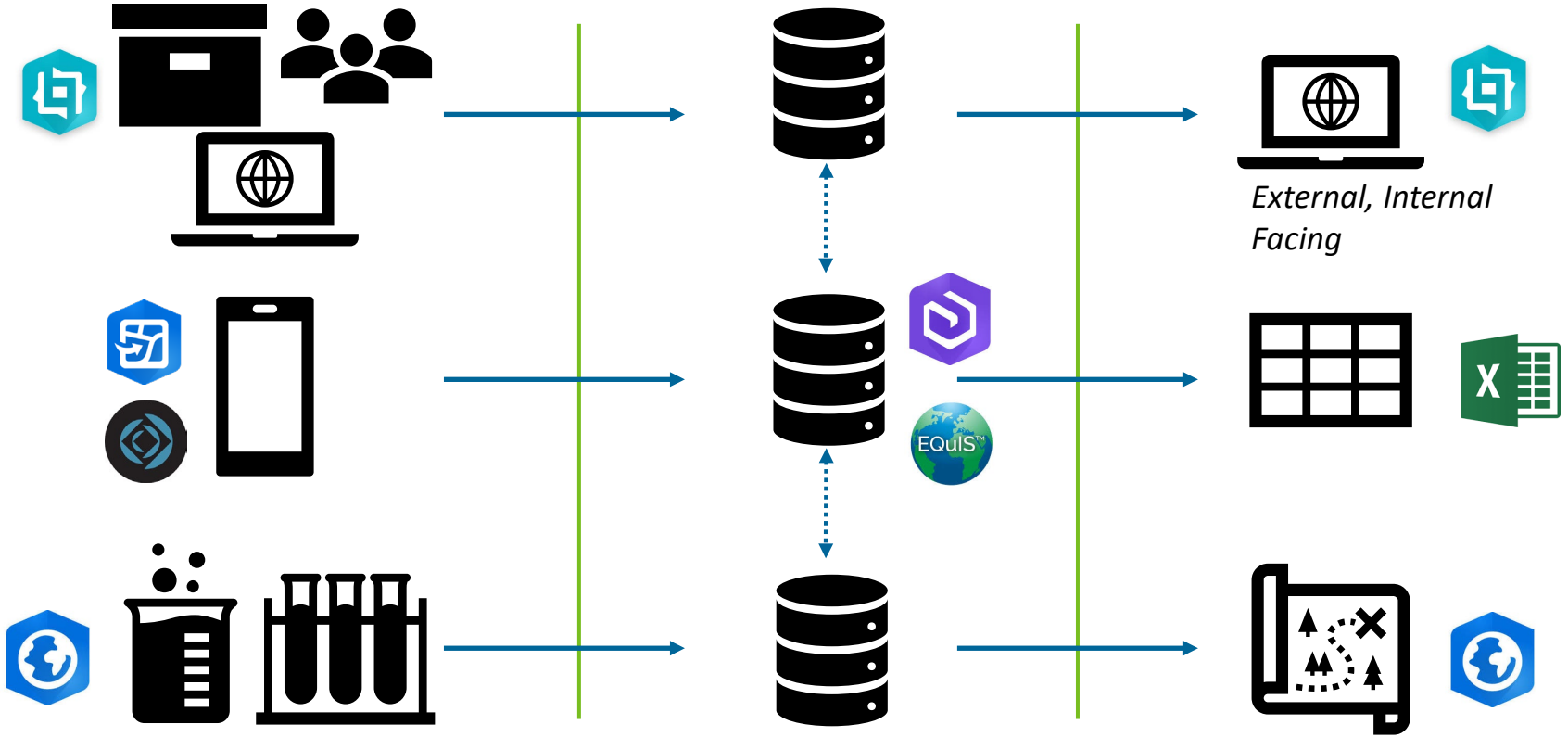
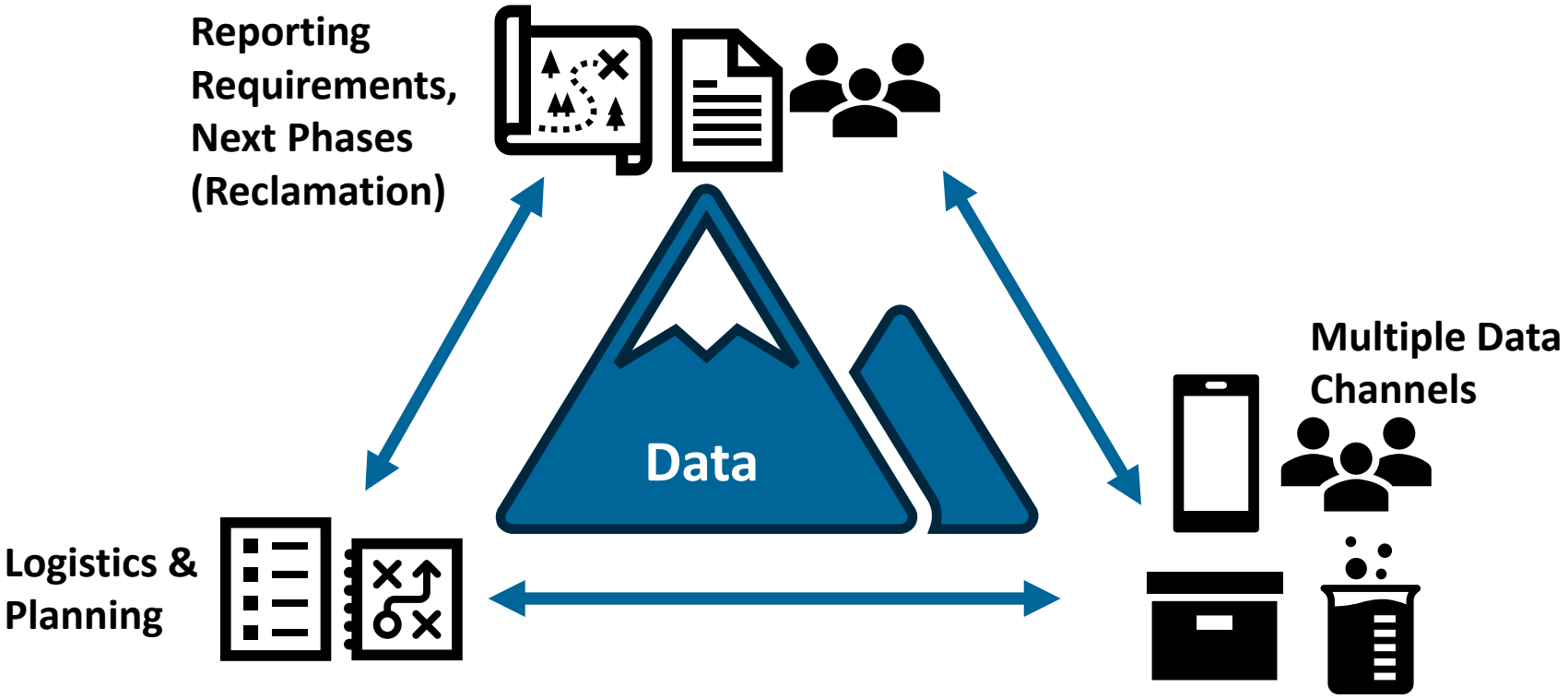
Client-Consultant Collaboration



Data Flows



Closing Remarks (Scaling the Mountain)



Acknowledgements

- Matrix/Montrose: Adam Stark, Janet Therrien, Sue Raynard, Belinda Dang, Sandy Lam, Emma Kary, Daniel Kibrom, Cassandra McKenzie, Calista Dubois, Padraic Mahood, Gabrielle Marchand, Seanna Paul, Hugh Craig, Megan Cargill, Rob Wenzel, Kelsey Bourgeois
- AltaLink: Brent Saulnier, Richard Henschel
- Samson Cree and Ermineskin Cree Nations

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SAMSON CREE NATION

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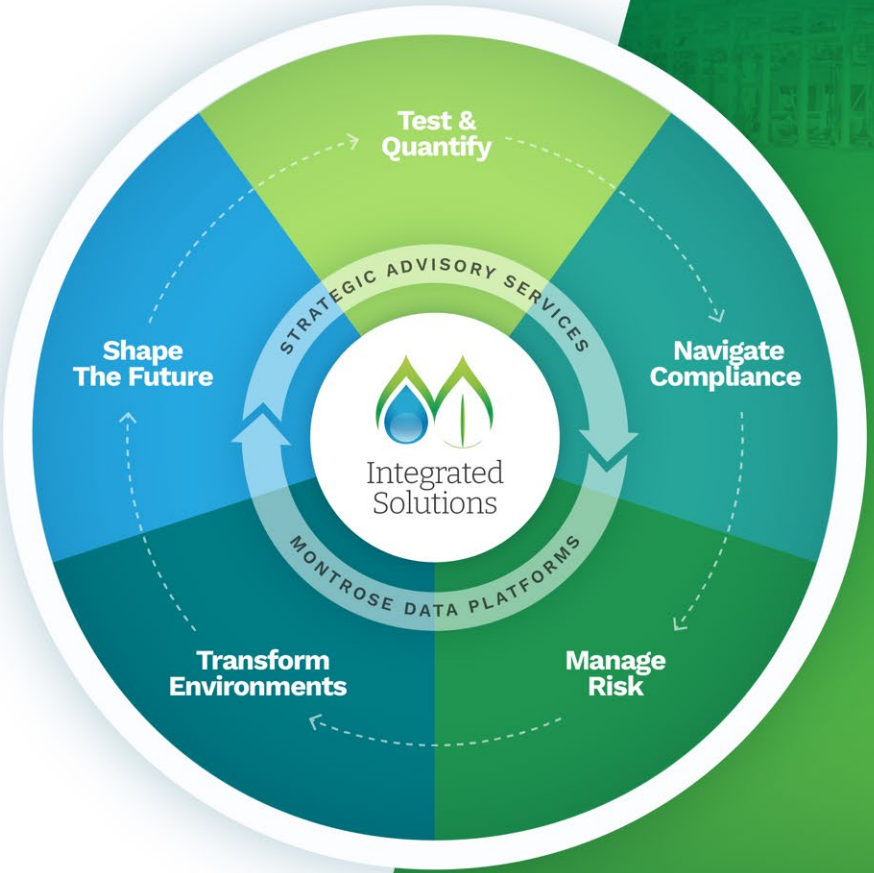

Montrose At A Glance

Montrose provides strategic, integrated solutions that guide organizations through environmental challenges, ultimately delivering business value and positively impacting our planet and society.

We implement environmental solutions that scale.

- ~3,200 employees
- ~100 locations worldwide
- ~5,600 clients from the private and public sectors
- 6 patents issued in 2022, for a total of 18 patents

MONTROSE ENVIRONMENTAL

Questions?

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