

Increasing Efficiency Through Implementing Field Technologies in a 93 Lot Phase I Environmental Site Assessment in Northern Alberta

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Key Topics

- Project Scope
- Field Preparation
- Software
- Data Analysis
- Functionalities and Client Benefits
- Final Outcomes and Efficiencies

Project Scope

Retained to conduct Phase I ESA's for 93 lots in a remote First Nation's community in Northern Alberta

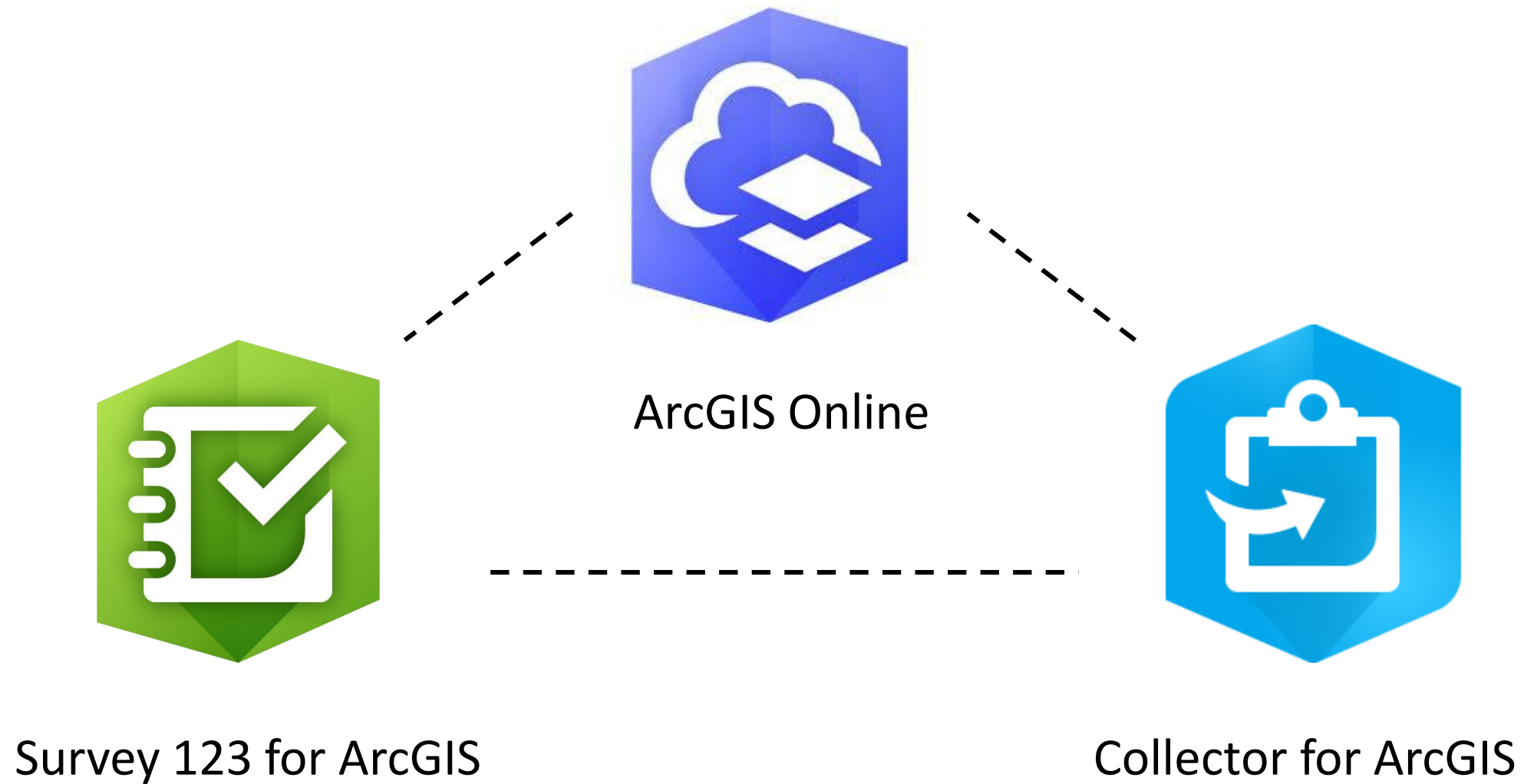
- 93 lots of mixed land use (residential, commercial and vacant)
 - ✓ **Logistics** (remote community with lots located across the community)
 - ✓ **Efficiency** (maximum number of sites per day)

Technology

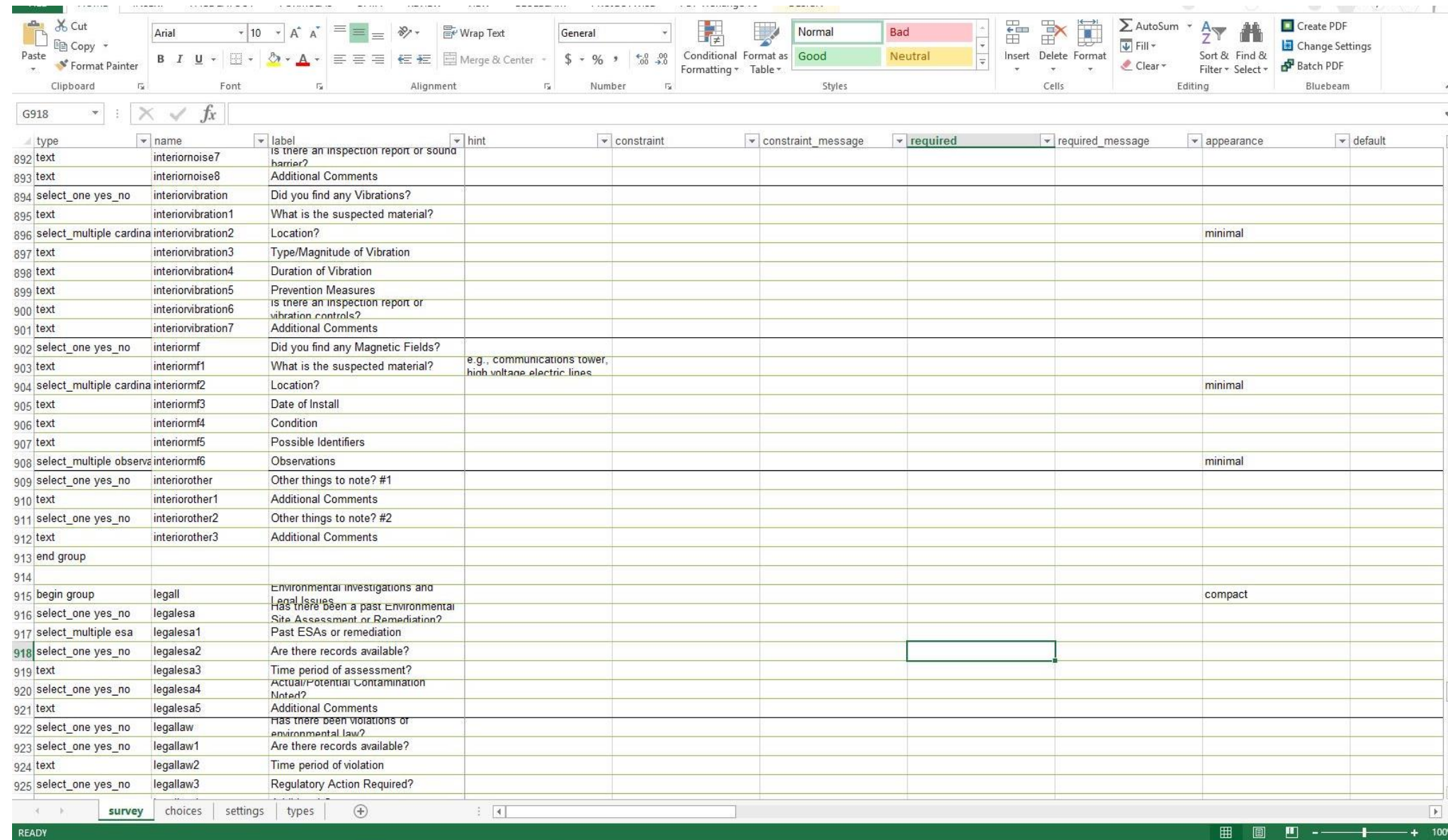
Field Preparation



Software



Software



The screenshot shows an Excel spreadsheet with a ribbon at the top containing tabs for Clipboard, Font, Alignment, Number, Styles, Cells, Editing, and Bluebeam. The spreadsheet contains a survey form with the following data:

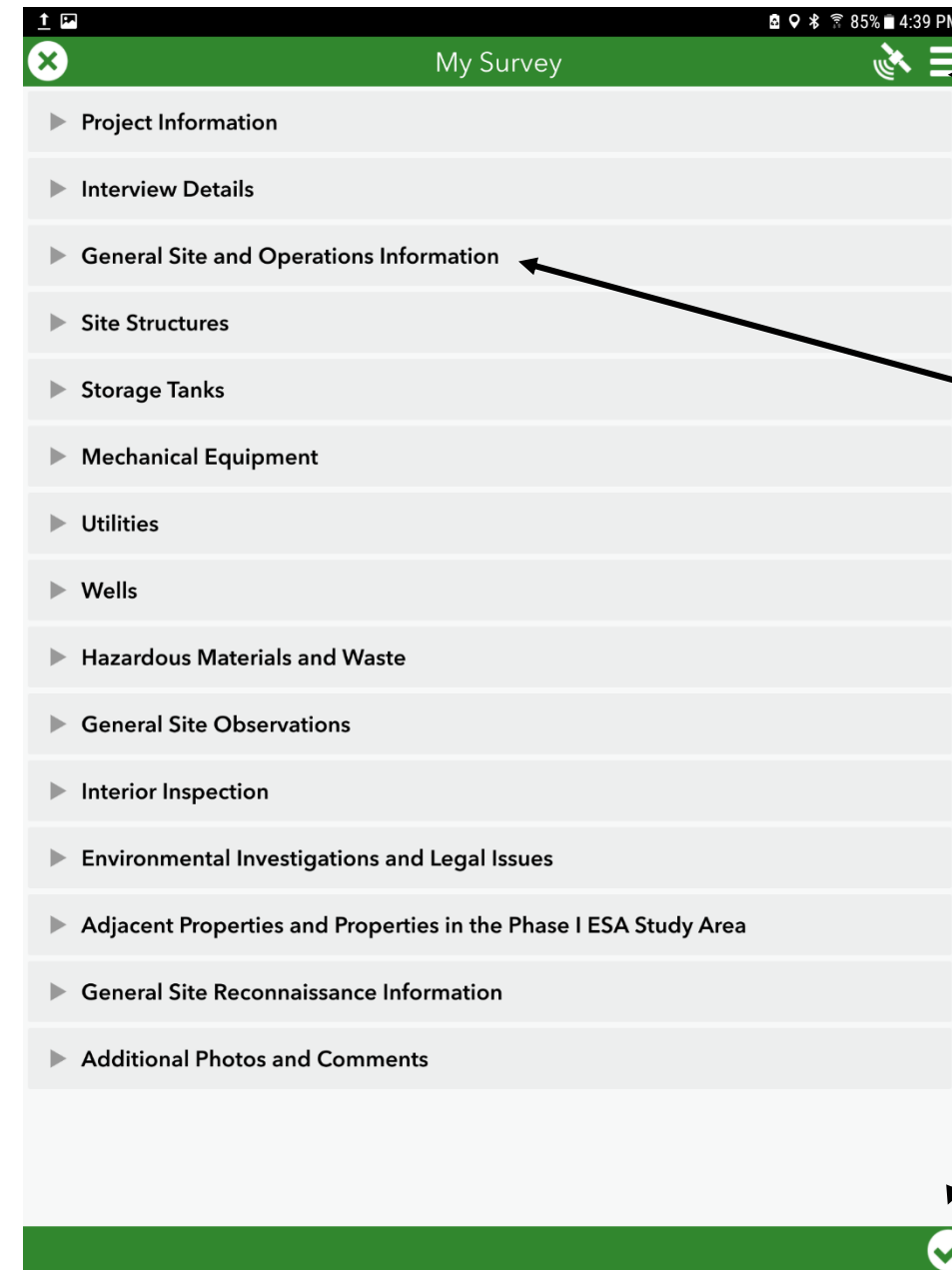
	type	name	label	hint	constraint	constraint_message	required	required_message	appearance	default
892	text	interiornoise7	Is there an inspection report or sound hammer?							
893	text	interiornoise8	Additional Comments							
894	select_one yes_no	interiorvibration	Did you find any Vibrations?							
895	text	interiorvibration1	What is the suspected material?							
896	select_multiple cardinal	interiorvibration2	Location?						minimal	
897	text	interiorvibration3	Type/Magnitude of Vibration							
898	text	interiorvibration4	Duration of Vibration							
899	text	interiorvibration5	Prevention Measures							
900	text	interiorvibration6	Is there an inspection report or vibration controls?							
901	text	interiorvibration7	Additional Comments							
902	select_one yes_no	interiormf	Did you find any Magnetic Fields?							
903	text	interiormf1	What is the suspected material?	e.g., communications tower, high voltage electric lines						
904	select_multiple cardinal	interiormf2	Location?						minimal	
905	text	interiormf3	Date of Install							
906	text	interiormf4	Condition							
907	text	interiormf5	Possible Identifiers							
908	select_multiple observed	interiormf6	Observations						minimal	
909	select_one yes_no	interiorother	Other things to note? #1							
910	text	interiorother1	Additional Comments							
911	select_one yes_no	interiorother2	Other things to note? #2							
912	text	interiorother3	Additional Comments							
913	end group									
914										
915	begin group	legall	Environmental Investigations and Legal Issues						compact	
916	select_one yes_no	legalesa	Has there been a past Environmental Site Assessment or Remediation?							
917	select_multiple esa	legalesa1	Past ESAs or remediation							
918	select_one yes_no	legalesa2	Are there records available?							
919	text	legalesa3	Time period of assessment?							
920	select_one yes_no	legalesa4	Actual/Potential Contamination Noted?							
921	text	legalesa5	Additional Comments							
922	select_one yes_no	legallaw	Has there been violations or environmental law?							
923	select_one yes_no	legallaw1	Are there records available?							
924	text	legallaw2	Time period of violation							
925	select_one yes_no	legallaw3	Regulatory Action Required?							

Easily programmed through excel

Software



Survey 123 for ArcGIS



Satellite-enabled

Easy-to-use menus

Manual and auto save features

Software



Survey 123 for ArcGIS

Polar questions

Software



Survey 123 for ArcGIS

A screenshot of the Survey 123 mobile application interface. The app is titled "My Survey" in a green header bar. The main content area contains several survey questions with radio button and dropdown menu options. The questions are: "Are there storage tanks?" (Yes/No), "UST Tank?" (Yes/No), "AST Tank?" (Yes/No), "Where is it located?" (Outside Building/Inside Building), "Where at the site is it located?" (dropdown), "Size/Volume?" (text input), "Volume Remaining" (text input), "Contents" (text input), and "Date of Install" (text input). A green bar at the bottom contains a white checkmark icon. An arrow points to the "Where is it located?" dropdown menu with the text "Drop down menus".

Drop down menus

Software



Survey 123 for ArcGIS

A screenshot of the Survey 123 for ArcGIS mobile app interface. The app is titled "My Survey" and shows a list of survey sections: "Environmental Investigations and Legal Issues", "Adjacent Properties and Properties in the Phase I ESA Study Area", and "General Site Reconnaissance Information". Below these is a section titled "Additional Photos and Comments" which contains four rows, each with a "Photo" field (containing camera and folder icons) and a "Comment" field (a text input area). The app has a green header bar with a close button and a green footer bar with a checkmark button. The status bar at the top shows the time as 4:34 PM and battery level at 86%.

Site photos

Captions

Software

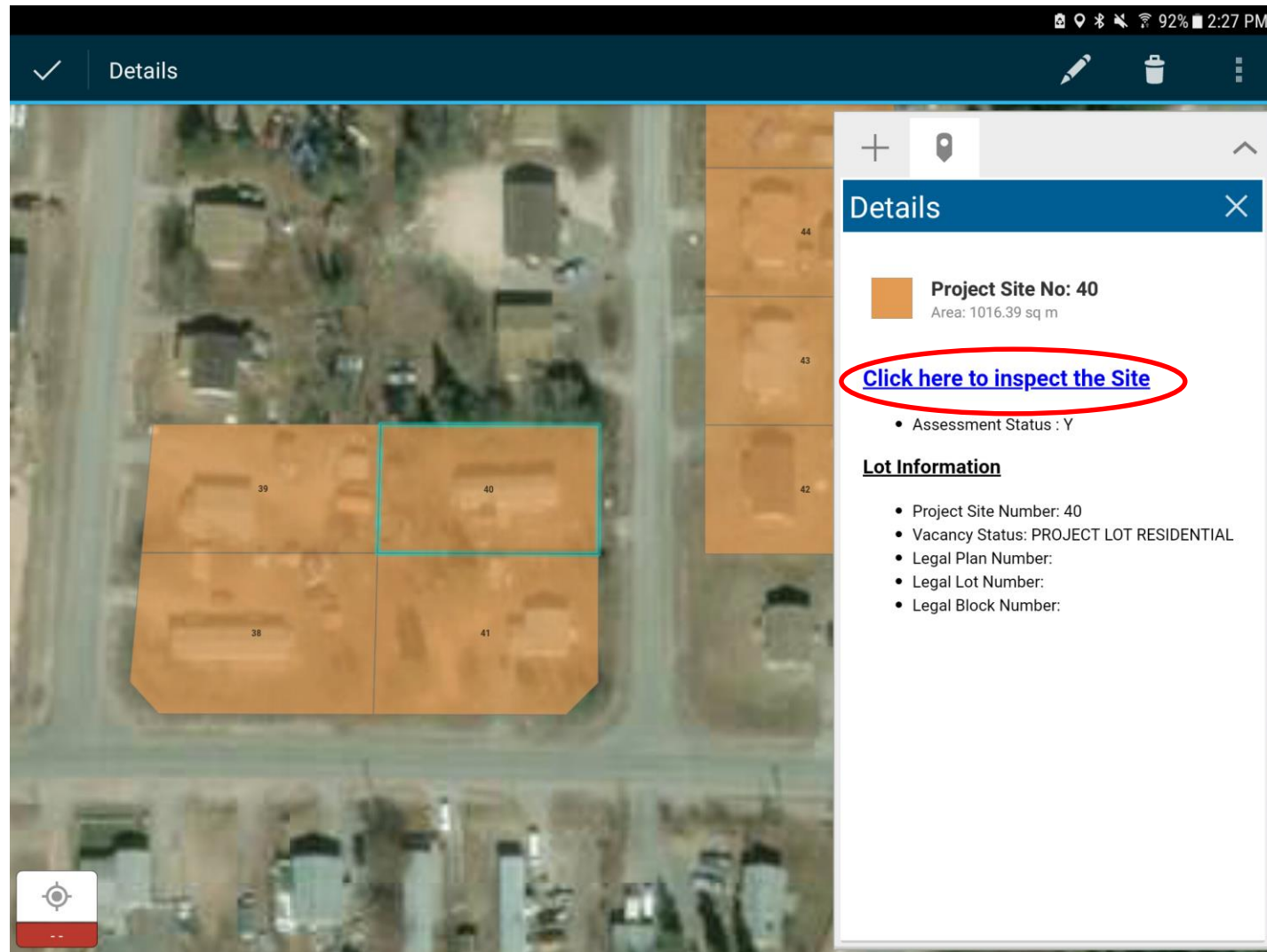


Survey 123 for ArcGIS



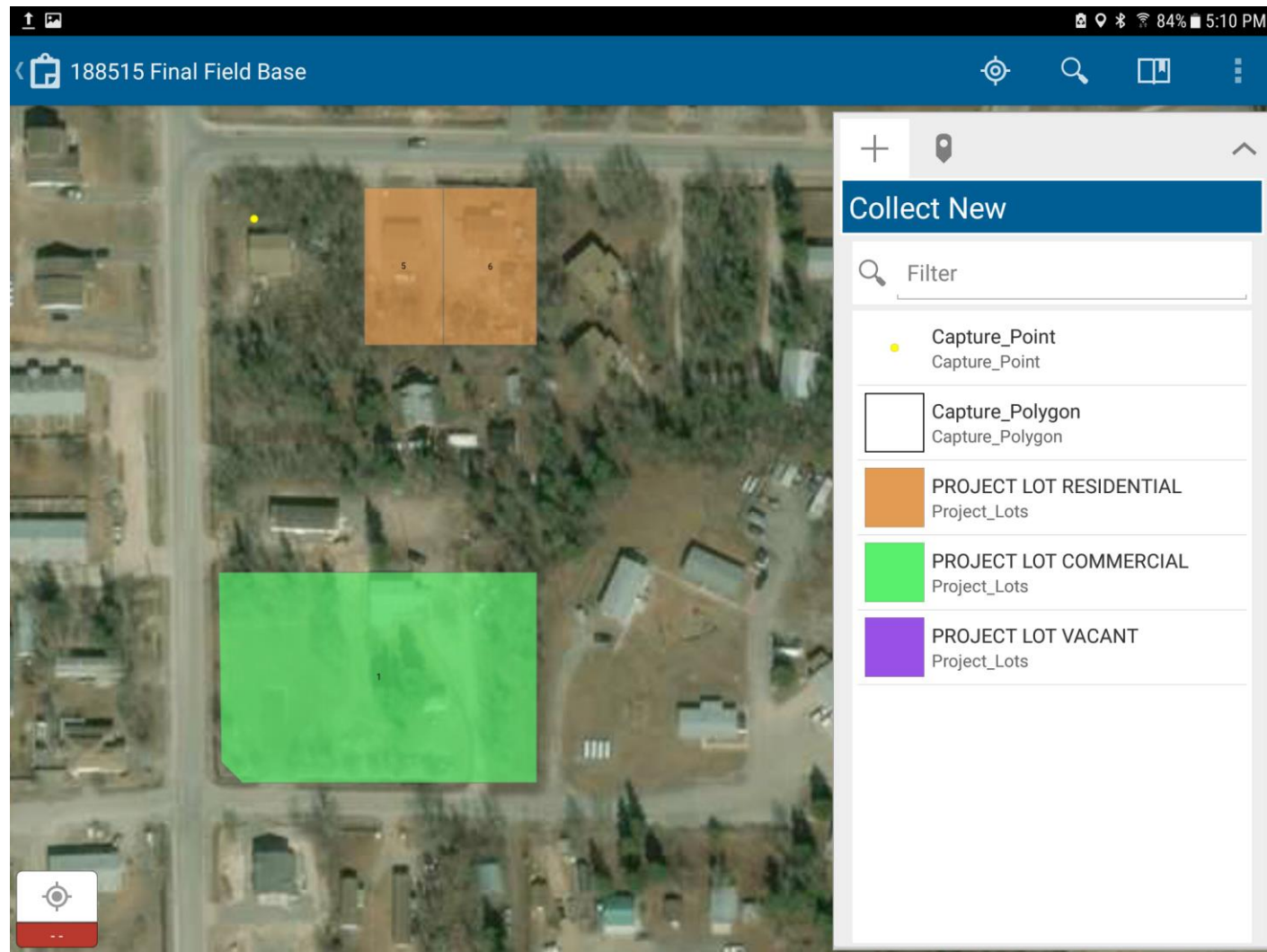
Collector for ArcGIS

Software



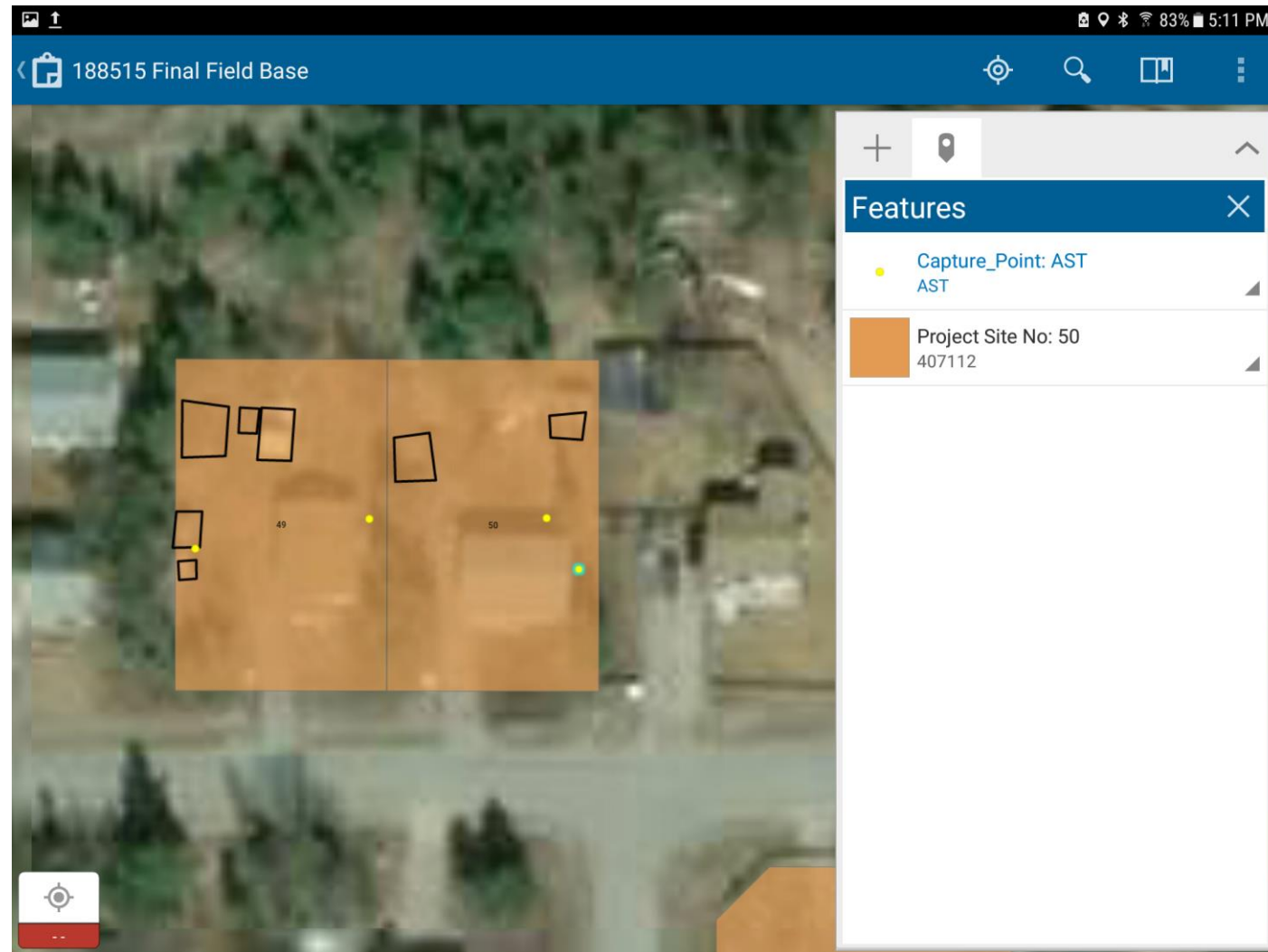
Collector for ArcGIS

Software



Collector for ArcGIS


Software



Collector for ArcGIS

Software

10/17/18 - 4/9/19 Filter Report (Beta) Export Open in Map Viewer Show individual response 104/104



Materials	Temporary or Permanent	Additional Comments	Heating Systems?	What is it?	Inside or outside the building?	Where is it located at the site?	Where in the building is it?	Owner
		Power lines run along south site boundary, power enters site at se corner and house at east wall	Yes	Fuel Oil	Outside Building	West		

Outside Building

Where at the site is it located?

West

Size/Volume?

1000 l

Volume Remaining

Unknown

Contents

Fuel oil

Date of Install

Likely within last year

Condition

New, good

Construction Material (steel, plastic)

Non-metallic

Frequency of Use/Filling

Data Analysis

<div> <div>FILE</div> <div>HOME</div> <div>INSERT</div> <div>PAGE LAYOUT</div> <div>FORMULAS</div> <div>DATA</div> <div>REVIEW</div> <div>VIEW</div> <div>ADD-INS</div> <div>PROJECTWISE</div> <div>PDFelement</div> <div>PDF-XChange</div> <div>Thomsen, Dana</div> </div>																
<div> <div> <div>Cut</div> <div>Copy</div> <div>Paste</div> <div>Format Painter</div> </div> <div> <div>Clipboard</div> </div> </div> <div> <div> <div>Calibri</div> <div>11</div> <div>A</div> <div>A</div> </div> <div> <div>B</div> <div>I</div> <div>U</div> <div></div> <div></div> <div></div> </div> <div> <div>Font</div> </div> </div> <div> <div> <div></div> <div></div> <div></div> </div> <div> <div>Wrap Text</div> <div>Merge & Center</div> </div> <div> <div>Alignment</div> </div> </div> <div> <div> <div>General</div> <div>\$</div> <div>%</div> <div></div> <div></div> <div></div> </div> <div> <div>Number</div> </div> </div> <div> <div> <div>Normal</div> <div>Bad</div> <div>Good</div> <div>Neutral</div> <div>Calculation</div> <div>Check Cell</div> </div> <div> <div>Conditional Formatting</div> <div>Format as Table</div> </div> <div> <div>Styles</div> </div> </div> <div> <div> <div>Insert</div> <div>Delete</div> <div>Format</div> </div> <div> <div>Cells</div> </div> </div> <div> <div> <div>AutoSum</div> <div>Fill</div> <div>Clear</div> </div> <div> <div>Sort & Filter</div> <div>Find & Select</div> </div> <div> <div>Editing</div> </div> </div>																
AN4																
	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD
1	Structure Location	Current or former struc	Date Placed on-site	Operational Status	Number of Storeys	Basement Present	Number of Exterior Do	Number of Windows	Length	Width	Number of Rooms	Condition of Building	Flooring Material	Interior Ceiling/Wall M	Foundation Material	Exterior Wall Material
2																
3	Central	current										good (exterior)			Concrete	Vinyl
4	Building	current	within 2018	active	2	yes	5	12				good, brand new				
5	NE	current	2018	Operating	2	yes						New			Concrete,Wood	Other,Wood
6	Central	current	At least 70s	In use	2	yes	2	10	10	7		Currently being renovated			Wood,Concrete	Wood,Vinyl
7	SW	current	Likely 60s or 70s and	Abandoned	1	yes	2	11	13	7		Good,boarded up			Wood,Concrete	Vinyl,Other
8	NW	current	Within last year	Not in use, still being c	1	yes	3	8	13	9		Brand new			Other,Wood,Concrete	Stucco,Other
9	NE	current	Within the last ten yea	In use	1	yes	2	8	12	8		New, good condition			Wood,Concrete	Other
10	Central	current	App. 5 years ago	Inn use	1	yes	2	7	12	8		New and good from outside				Wood,Concrete
11																
12	SW	current	Within the last ten yea	In use	1	yes	2	9	12	8		New, good			Wood,Concrete	Other
13	NE	current	within last 10 years	active	1	no	2	1	7	15		good	Wood	Wood	Wood	Wood
14	SE	current		in use		no	1	2	1	3		rusting				
15																
16																
17	Central	current	about 10 years ago	vacant	1	yes	2	8	11	8		poor, in disrepair			Concrete	Vinyl
18	Central	current	10 years ago	active residential	1	no	2	8	13	9		good				Vinyl
19																
20	Central	current	Likely. Placed 15 yrs a	In use	1	no	2	9	20	4		Good			Wood	Vinyl,Wood
21	NE	current			1	no	1	0	2	2		Decent but has some holes			Wood	
22	Central	current		In use	1	no	3	9	15	2.5		Good, some warping of trailer siding			Wood	Vinyl,Wood
23																
24																
25	Central	current	30-40 years ago	active home	1	no	2	9	8	2					Concrete	Vinyl
26	NE	current		campfire hut with tarp	1	no	0	0	5	3		run down, plywood co	Other	Wood	Wood	Wood
27	SE	current		main house	1	yes	2	9	10	10		good			Concrete	Vinyl
28	NW	current		in use	1	no	2	4	18	3		rusting, in disrepair			Wood	Aluminum
29																
30																
31	Central	current	Within last year (new b	Unoccupied	1	yes	3	8	13	9		New, good			Other	Stucco,Other,Wood
32	Central	current	About 15 years old	In use	1	yes	2	9	12	8					Concrete,Wood	Other
33	Central	current	40 years ago	Not occupied	1	yes	2	8	10.5	7					Concrete	Other
34	Central	current	Similar to houses on lo	In use	1	yes	2	14	13	9		Good			Concrete,Wood	Other
35	SE	current	Unknown	In use by tenant on property south of site		no	3	5	7	7		Good			Wood	Wood
36	NE	current		active	1	yes	2	9	10	8		good			Vinyl	
37	Central	current	12-20 years ago	active house	1	yes	2	10	10	7					Concrete	Vinyl
38	NW	current	15 years ago	in use	1	yes	2	8	6	6					Concrete	Vinyl
39	NW	current		active home	1	yes	2	7	10	7		good			Concrete	Wood,Vinyl
40	NW	current		in disrepair	1	no	2	4	10	4			Wood		Aluminum	
41	Central	current		In use	1	yes	2	8	9	9		Minor exterior damage			Wood,Concrete	Other,Wood
42	Central	current	25-30 years	Unknown, possibly un	1	no	2	7	19.5	6.5		Decent,no observable structural issues			Wood	Wood,Other
43	Central	current	approximately 15 year	In use	1	yes	2	12	12	8		Good			Concrete	Wood,Other
44	Central	current	Around 10 years ago	In use	1	no	2	6	13	7		Good			Wood	Other,Wood
45	Central	current	About 10 years ago	In use	1	no	2	7	11	7		Good				Other,Wood
46	Central	current	20 years ago	in use	1	no	2	7	12	7		good			Concrete	Vinyl
47	Central	current		in use	1	no	2	8	13	8		good, one broken window			Concrete	Vinyl
48	Central	current	10-15 years ago	active house	1	no	2	7	10	7		good			Concrete	Vinyl
49	Central	current	within 2018	under construction	1	no	2	5	12	4		good			Steel	Vinyl
50	Central	current	20-30 years	active	1	no	2	9	18	4		generally good, some broken windows			Wood,Other	Vinyl
51	Central	current	15-20 years ago	Unoccupied	1		2	5	13	9		Good, renovations occurring according to Shane			Wood,Other	Other,Wood
52	Central	current	15-20 years	In use	1		1	3	12	8		Old,good			Wood,Concrete	Other,Wood
53	Central	current	15-20 years	In use	1	yes	2	9	11	7.5		Good			Wood,Concrete	Other,Wood
54																



ArcGIS Online



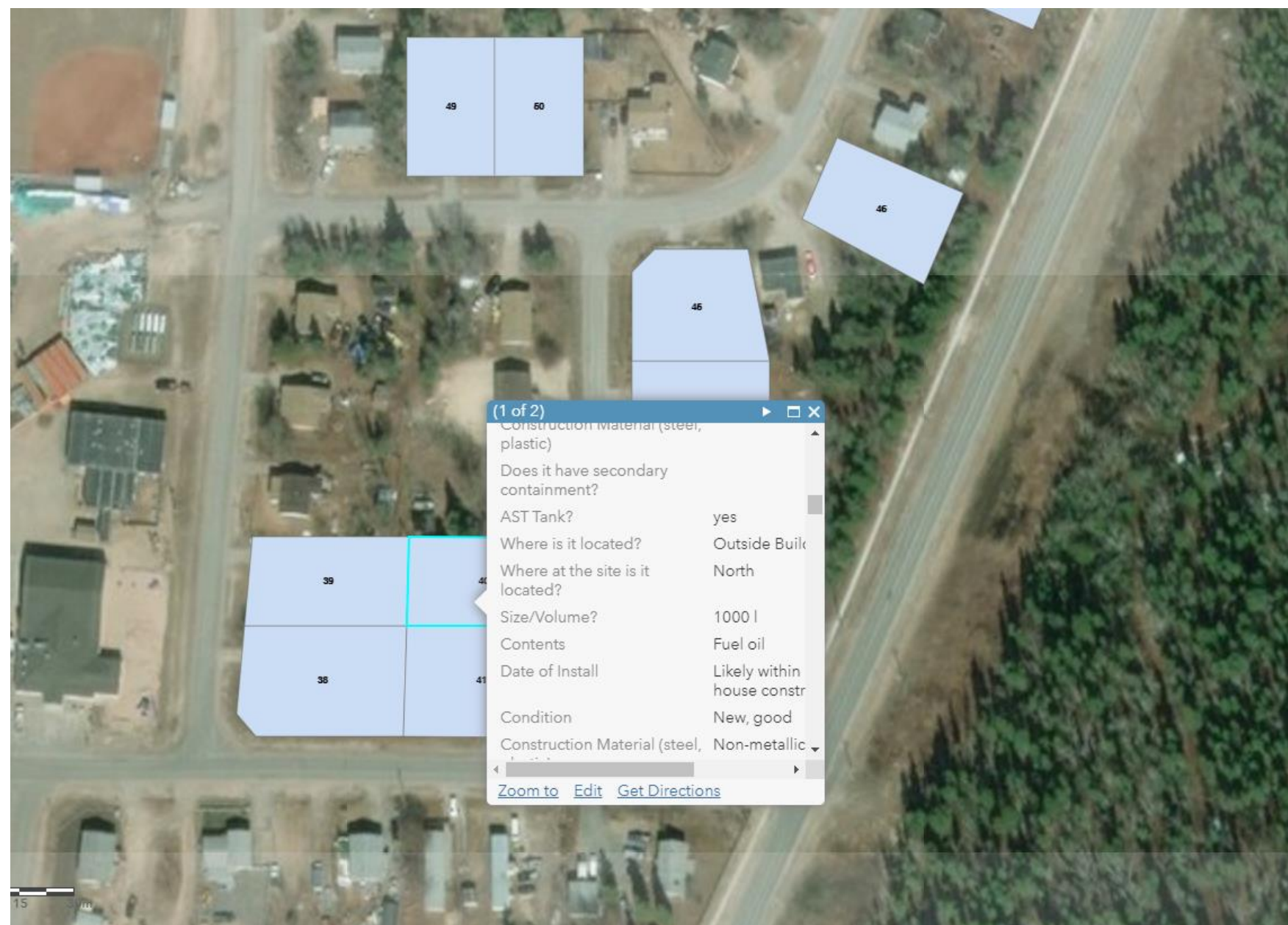


ArcGIS Online



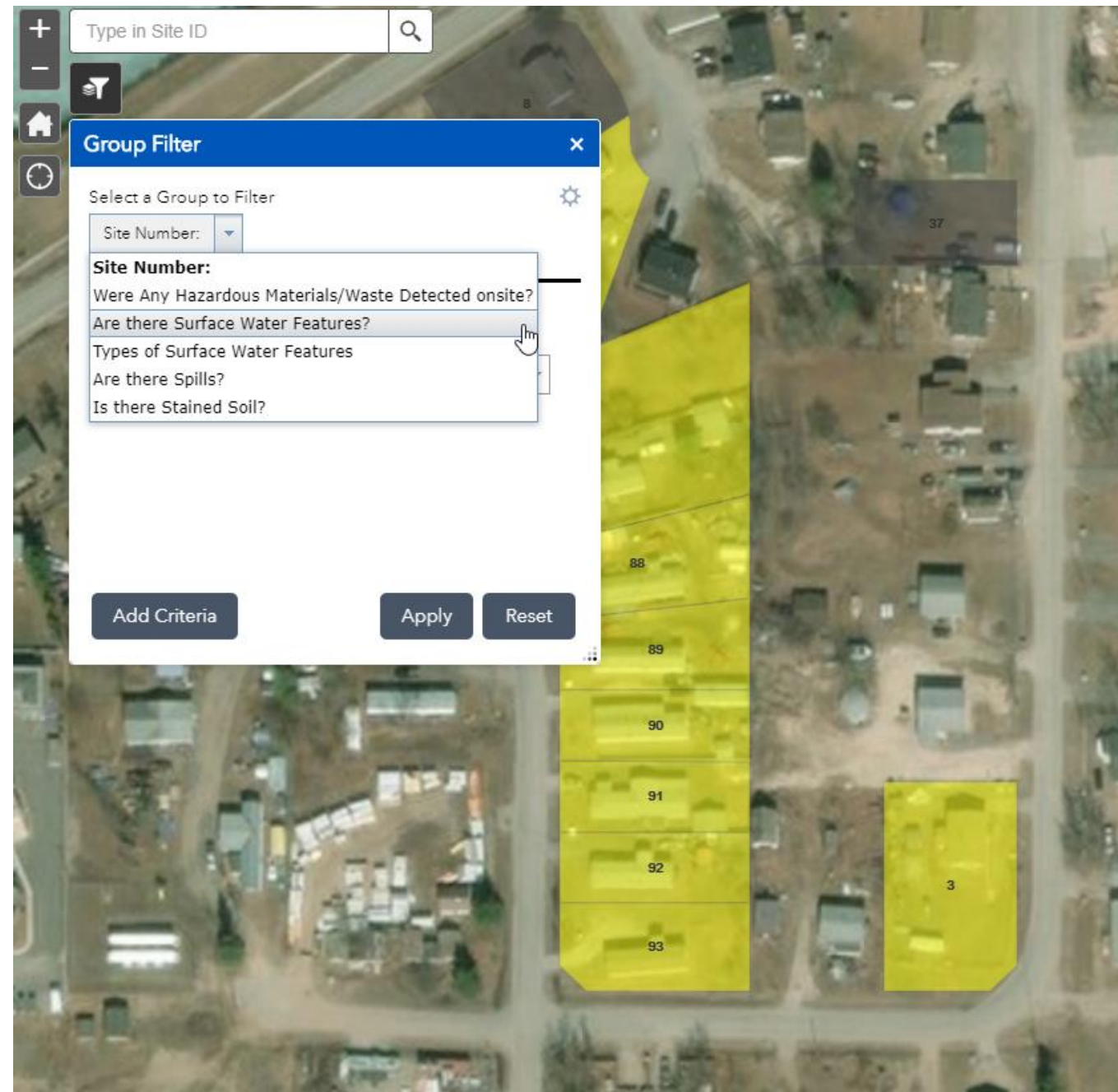


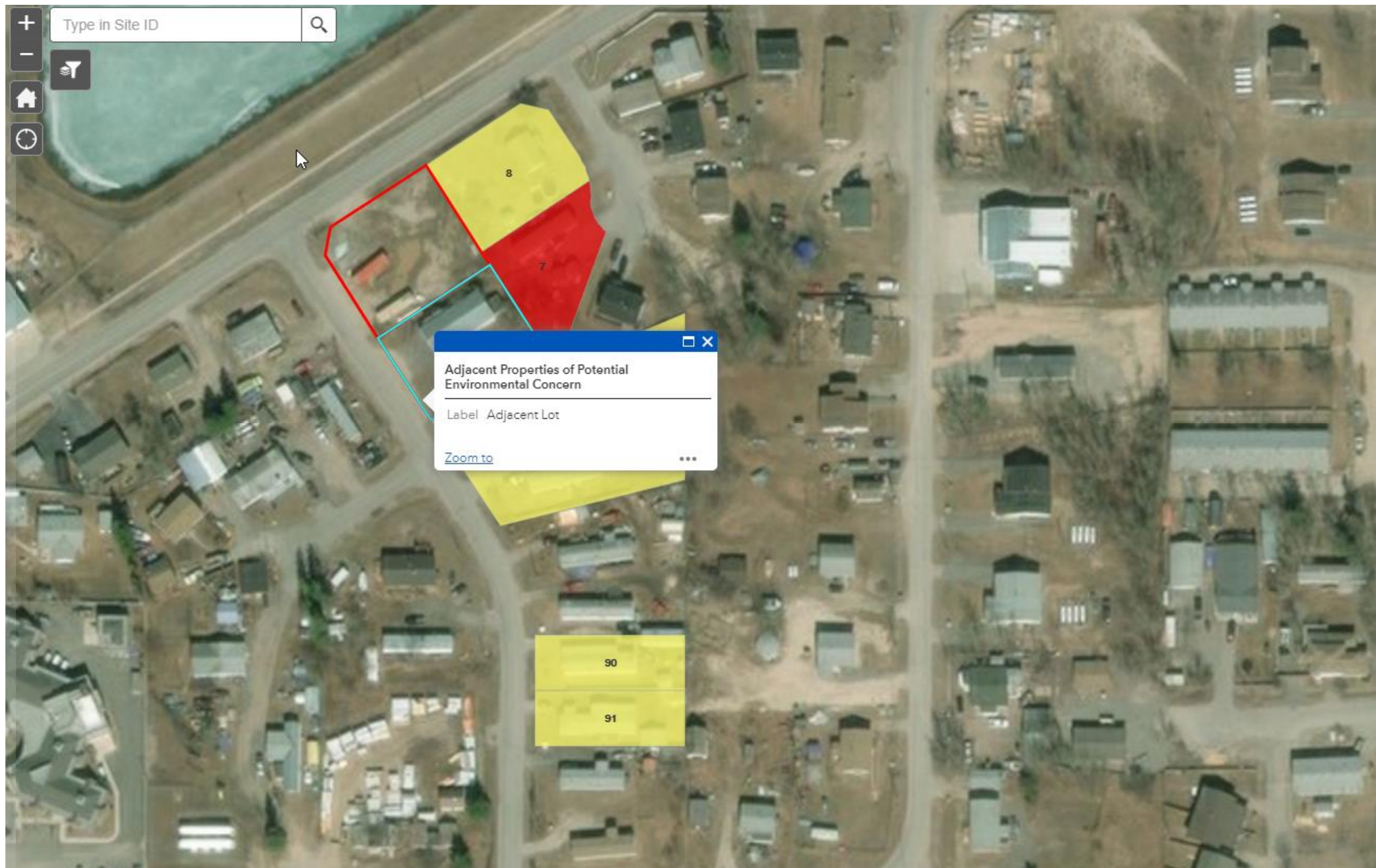
ArcGIS Online

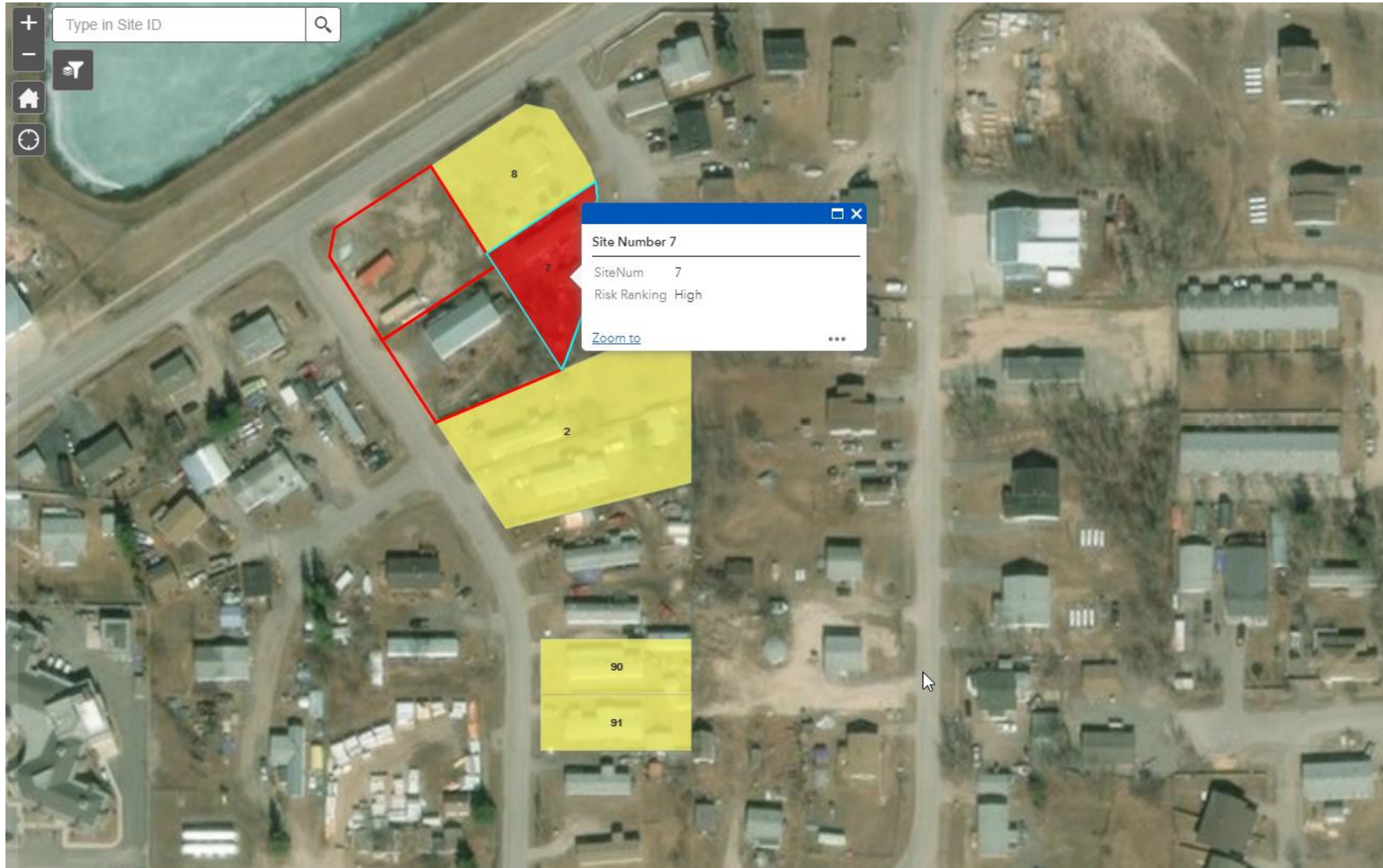




ArcGIS Online









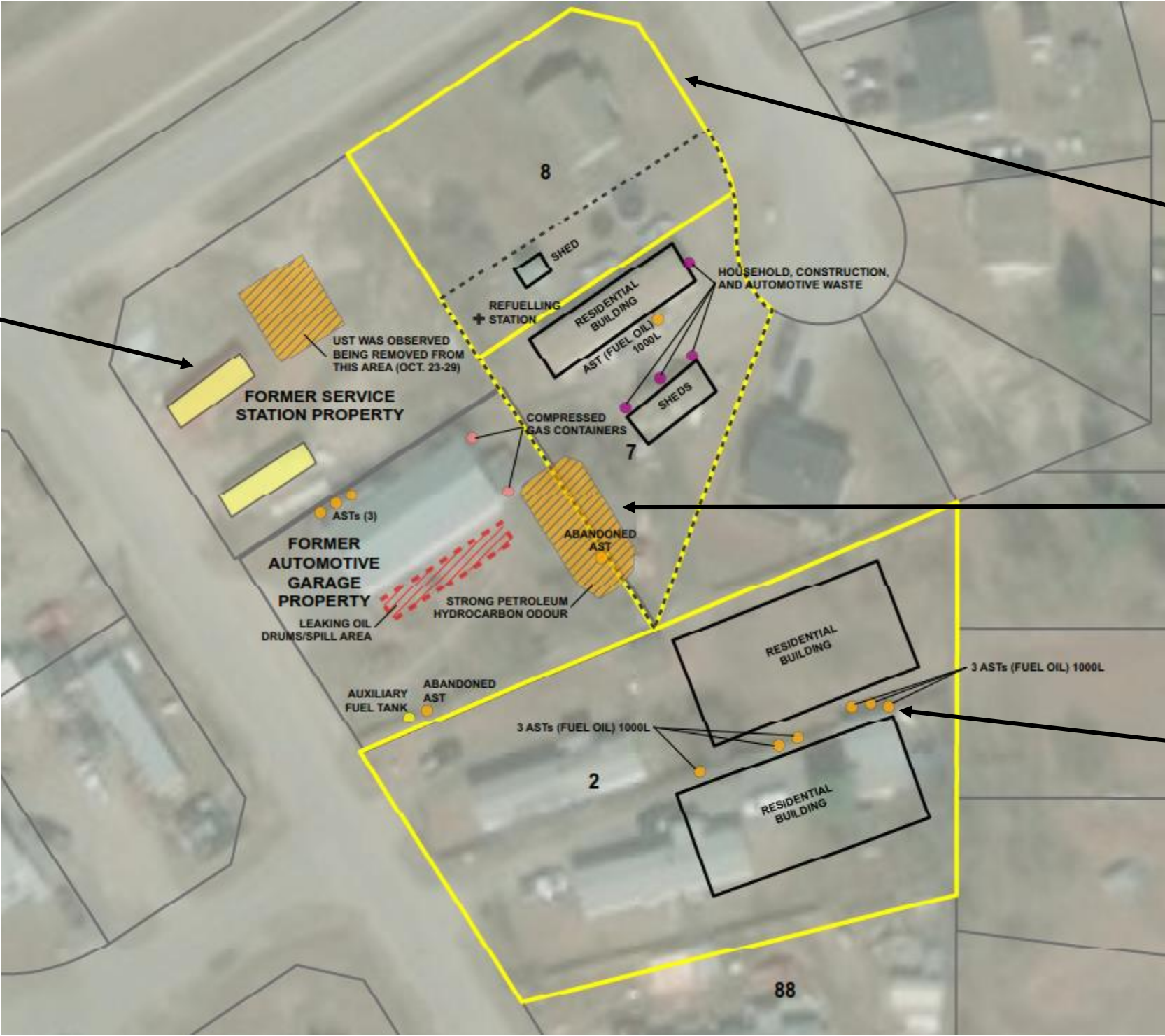
80% of the field data was directly transferrable to the interactive map and figures

Polygons from field data

Site boundary outline

Observed spill locations

Points from field data



Final Outcomes

To what extent were we able to increase our efficiency?

- Field phase
- Data analysis phase
- Reporting phase

Final Outcomes

Field Phase

- Preprogramming field tablets (~2-3 hours for a brand new assessment sheet)
- 10 sites per day (2 field technicians)
- 10-day field program
- Cloud based field note upload
- Cloud based photo upload

Final Outcomes

Data Analysis Phase

- Export field data directly into raw excel format
- Use functions and VBA statements to sort through the data
- Create a site summary table
- Assign potential environmental risk rankings to the sites

Final Outcomes

Reporting Phase

- Replaced mass text within the report with a site summary table
- Directly transfer up to 80% of our field data into our interactive map and figures

Estimated 60%
increased efficiency

Summary

- ArcGIS Online with Survey 123 and Collector for GIS
- Site summary table and risk ranking matrix
- Transfer digital data to our report figures
- Interactive GIS map with filters and multiple informative layers

Thank you!

Acknowledgements

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