COMPLETING FIRE EQUIPMENT INSPECTIONS WITH FIELD MAPS

Overview and Tutorial

SOUTHERN AFRICAN WILDLIFE COLLEGE
TRAINING BEYOND BOUNDARIES

FLEMING

June 2023

Southern African Wildlife College

Prepared by students of Sir Sanford Fleming College in partial fulfilment of academic requirements

SOUTHERN AFRICAN WILDLIFE COLLEGE
TRAINING BEYOND BOUNDARIES

Contents

Introduction

This documentation serves as a tutorial for preparing and using Field Maps to conduct equipment inspections in the field, and how to complete inspections in the field. This approach differs from the one outlined in the *Field Surveys with Field Update Layers* instruction package, where Field Update layers are recommended as an intermediary for quality assurance and control purposes. Alternatively, copies of the data can be used as intermediaries if desired.

This document also includes an overview of the status of fire equipment spatial data and what is still required to complete it. Once the fire equipment spatial data is in a ready state, this documentation should be revised to reflect, making a simpler training package for new users.

Use Cases:

- Conducting in-field updates directly to datasets, without the use of Field Update layers.
- Conducting and monitoring annual fire equipment inspections for fire extinguishers, fire hydrants, fire hoses, and fire horns.

Instruction Overview:

These instructions will cover:

- An overview of the existing fire equipment data status.
- Preparing for inspections using Field Maps.
- Conducting an inspection and updating the fire equipment data in field using Field Maps.
- Monitoring inspection progress in ArcGIS Online (AGOL) Map Viewer.
- Printing evidence and updating the SAWC File Geodatabase Library (SAWC FGDB Library).

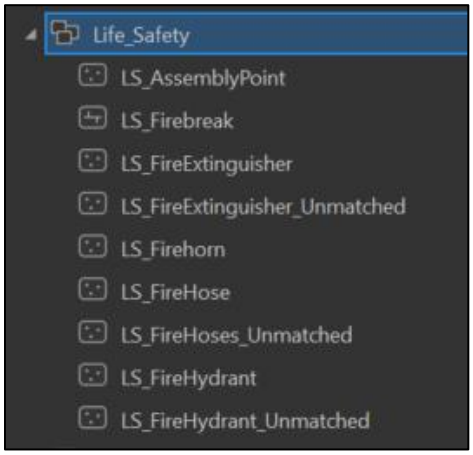
An overview of the existing fire equipment data

At the time of this document's creation, the fire equipment spatial data is incomplete. The schema has been created, which includes the equipment codes found in the OHS Equipment Register, and the questions provided in the sample inspection forms; both of which was provided by Operations. However, most of the records do not have a spatial location on campus, and most data columns related to the inspection are currently null, as the Fleming development team did not have access to the entire inspection record.

As each equipment type has different inspection questions on the Fire Inspection Form, fire equipment data was split into individual feature classes for fire extinguishers, fire hydrants and fire hoses. Each of these feature classes is found in the Life Safety feature dataset, within the Staff File Geodatabase (Staff FGDB). Fire horns are also included in this dataset; however, they are not

listed in the OHS equipment list. Also included in the data set, but not linked to the OHS Equipment table, are fire breaks, emergency assembly points, and unmatched equipment (more information coming on unmatched equipment features).

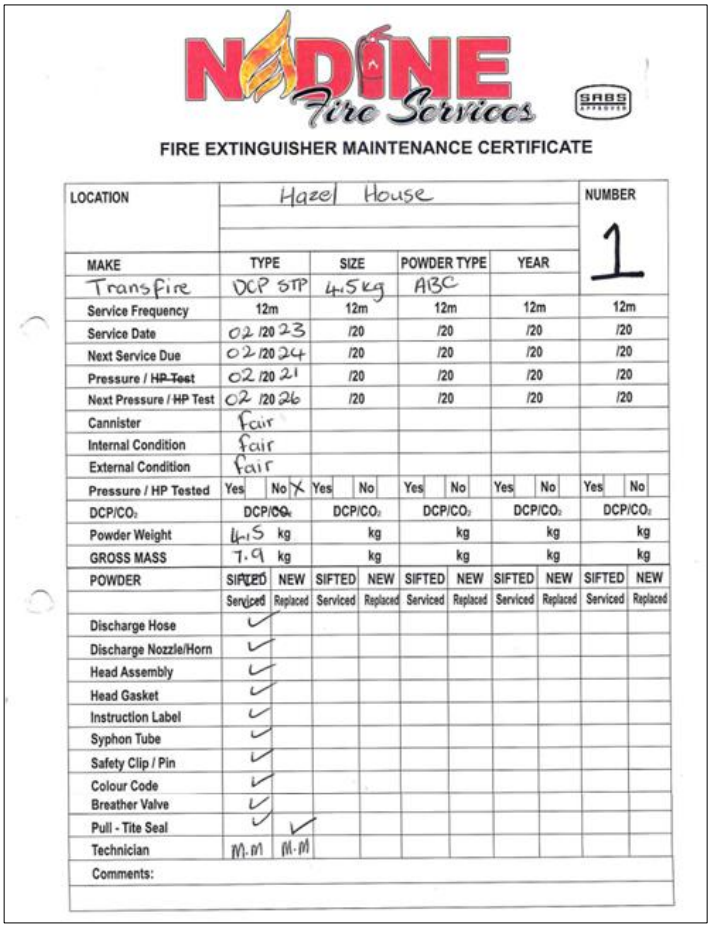
Life Safety Feature Dataset in the Staff FGDB:



Screenshot of section of the Fire Extinguisher Fields Schema in ArcGIS Pro

Field Name	Alias	Data Type	Allow NULL	Domain	Default	Length
OBJECTID	ObjectID	Object ID				
Shape	Shape	Geometry	✓			
Comments	Comments	Text	✓			255
NumCode	Number Code	Text	✓			5
SizeKG	Size (kg)	Float	✓			
ServiceFreqM	Service Frequency (months)	Short	✓		12	
MakeYear	MakeYear	Date	✓			
InsepectionDue	Inspection Due? (Y/N)	Text	✓	Y/N		1
ServiceDate	ServiceDate	Date	✓			
NextServiceDate	Next Service Date	Date	✓			
PressureHPTestDate	Pressure/HP Test Date	Date	✓			
NextPressureHPTestDate	Next Pressure/HP Test Date	Date	✓			
PowderWeight	PowderWeight (kg)	Float	✓			
GrossMass	Gross Mass (kg)	Float	✓			
Equipment	Equipment	Text	✓			20
Make	Make	Text	✓	FireEquipMake		20
Type	Type	Text	✓			20
PowderType	PowderType	Text	✓			20
CannisterCondition	CannisterCondition	Text	✓	EquipmentCondition		10
InternalCondition	InternalCondition	Text	✓	EquipmentCondition		10
ExternalCondition	External Condition	Text	✓	EquipmentCondition		10
PressureHPTestSession	Pressure/HP Test This Session	Text	✓	Yes/No		4
DCPorCO2	DCP or CO2	Text	✓	DCP/CO2		4
PowderSiftedOrNew	Powder Sifted Or New	Text	✓	Sifted/New		7
DischargeHose	Discharge Hose	Text	✓	Serviced/Replaced		9
DischargeNozzleHorn	Discharge Nozzle Horn	Text	✓	Serviced/Replaced		9
HeadAssembly	Head Assembly	Text	✓	Serviced/Replaced		9
HeadGasket	Head Gasket	Text	✓	Serviced/Replaced		9
InstructionLabel	Instruction Label	Text	✓	Serviced/Replaced		9
SyphonTube	Syphon Tube	Text	✓	Serviced/Replaced		9
SafetyClipPin	Safety Clip Pin	Text	✓	Serviced/Replaced		9
ColourCode	Colour Code	Text	✓	Serviced/Replaced		9
BreatherValve	Breather Valve	Text	✓	Serviced/Replaced		9
PullTiteSeal	Pull Tite Seal	Text	✓	Serviced/Replaced		9
TechInitials	Technician Initials	Text	✓			4
Location	Location	Text	✓			100
FID	FID	Short	✓			
GlobalID	GlobalID	Global ID				

Sample Fire Inspection Form for a Fire Extinguisher



NODINE Fire Services

FIRE EXTINGUISHER MAINTENANCE CERTIFICATE

LOCATION	Hazel House				NUMBER 1
MAKE	TYPE	SIZE	POWDER TYPE	YEAR	
Transfire	DCP STP	4.5kg	ABC		
Service Frequency	12m	12m	12m	12m	12m
Service Date	02 /20 23	/20	/20	/20	/20
Next Service Due	02 /20 24	/20	/20	/20	/20
Pressure / ~~HP Test~~	02 /20 21	/20	/20	/20	/20
Next Pressure / HP Test	02 /20 26	/20	/20	/20	/20
Cannister	fair				
Internal Condition	fair				
External Condition	fair				
Pressure / HP Tested	Yes No X	Yes No	Yes No	Yes No	Yes No
DCP/CO_2	DCP/~~CO_2~~	DCP/CO_2	DCP/CO_2	DCP/CO_2	DCP/CO_2
Powder Weight	4.5 kg	kg	kg	kg	kg
GROSS MASS	7.9 kg	kg	kg	kg	kg

POWDER	SIFTED	NEW	SIFTED	NEW	SIFTED	NEW	SIFTED	NEW	SIFTED	NEW
	Serviced	Replaced	Serviced	Replaced	Serviced	Replaced	Serviced	Replaced	Serviced	Replaced
Discharge Hose	✓									
Discharge Nozzle/Horn	✓									
Head Assembly	✓									
Head Gasket	✓									
Instruction Label	✓									
Syphon Tube	✓									
Safety Clip / Pin	✓									
Colour Code	✓									
Breather Valve	✓									
Pull - Tite Seal	✓	✓								
Technician	M.M	M.M								
Comments:										

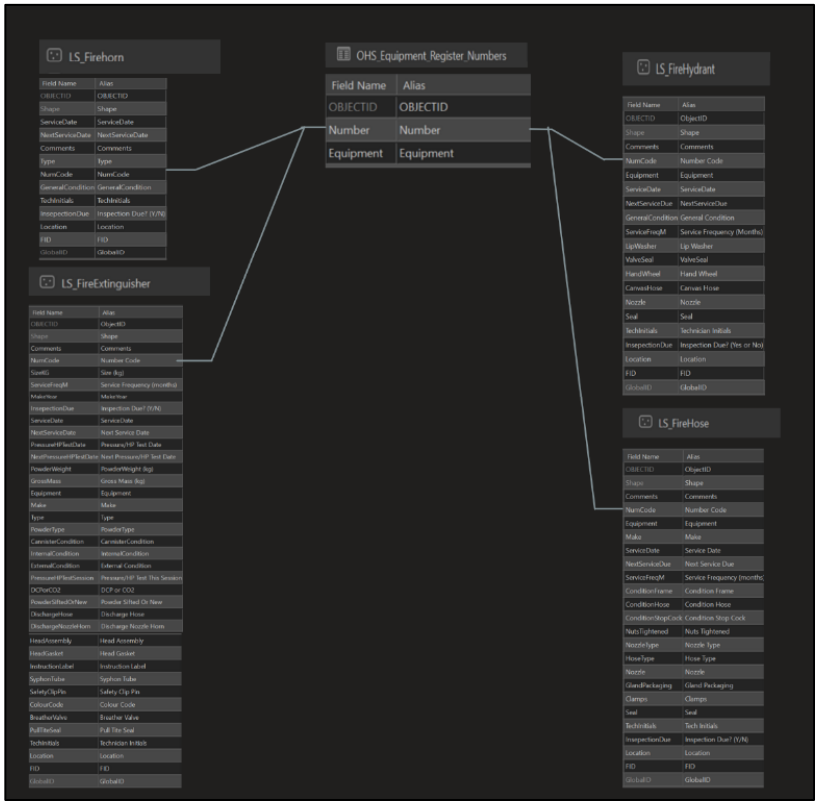
Section of the Fire Equipment attribute table in ArcGIS Pro

	ObjectID *	Shape *	Comments	Number Code	Size (kg)	Service Frequ...
1	1	Point	Listed as Haz...	001	4.5	12
2	2	Point	<Null>	002	4.5	12
3	3	Point	<Null>	004	4.5	12
4	4	Point	<Null>	005	4.5	12
5	5	Point	<Null>	006	4.5	12
6	6	Point	<Null>	007	4.5	12
7	7	Point	<Null>	008	4.5	12
8	8	Point	<Null>	009	9	12
9	9	Point	<Null>	010	4.5	12
10	10	Point	<Null>	011	9	12
11	11	Point	<Null>	012	4.5	12
12	12	Point	<Null>	013	2	12
13	13	Point	<Null>	014	4.5	12
14	14	Point	<Null>	015	4.5	12
15	15	Point	<Null>	016	4.5	12
16	16	Point	<Null>	017	4.5	12
17	17	Point	<Null>	019	9	12
18	18	Point	<Null>	020	9	12
19	19	Point	<Null>	021	9	12
20	20	Point	<Null>	023	4.5	12
21	21	Point	<Null>	024	4.5	12
22	22	Point	<Null>	026	4.5	12
23	23	Point	<Null>	027	4.5	12
24	24	Point	<Null>	028	4.5	12
25	25	Point	<Null>	029	4.5	12

Section of the OHS Equipment List including the number code

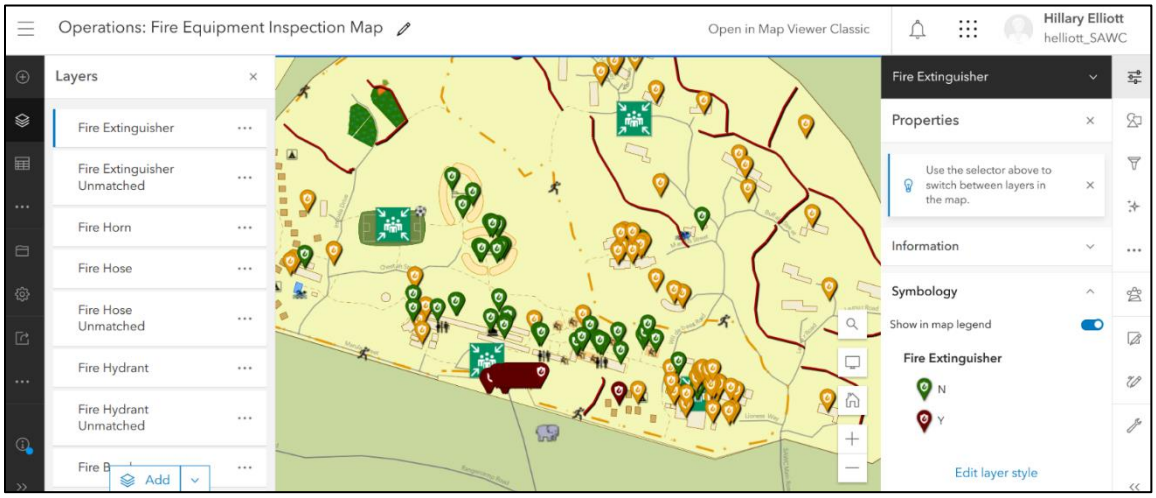
OHS Equipment Register		
Number	**Equipment**	**Location**
1	Fire Extinguisher	House D
2	Fire Extinguisher	Workshop Generator
3	Fire Hydrant	Workshop Generator
4	Fire Extinguisher	Infrastructure
5	Fire Extinguisher	Infrastructure
6	Fire Extinguisher	Diesel tank
7	Fire Extinguisher	Diesel tank
8	Fire Extinguisher	Champion's Corner
9	Fire Extinguisher	Welding
10	Fire Extinguisher	Welding
11	Fire Extinguisher	Old Daimler
12	Fire Extinguisher	Old Daimler
13	Fire Extinguisher	IT Store Room (WS)
14	Fire Extinguisher	IT Store Room (WS)
15	Fire Extinguisher	Workshop
16	Fire Extinguisher	Workshop
17	Fire Extinguisher	Workshop
18	Hose Reel	Workshop
19	Fire Extinguisher	Workshop
20	Fire Extinguisher	Store Room
21	Fire Extinguisher	Store Room
22	Hose Reel	Store Room
23	Fire Extinguisher	Maintenance Toilets
24	Fire Extinguisher	Maintenance Toilets
25	Hose Reel	Maintenance Toilets
26	Fire Extinguisher	Square Davel
27	Fire Extinguisher	Square Davel
28	Fire Extinguisher	Square Davel
29	Fire Extinguisher	RRM
30A	Fire Extinguisher	RRM
30B	Fire Extinguisher	RRM
31	Fire Extinguisher	Conference Hall
32	Fire Extinguisher	ALRD
33	Fire Extinguisher	Big Classroom

Relationship classes joining the OHS Equipment Register Numbers to each fire equipment piece.

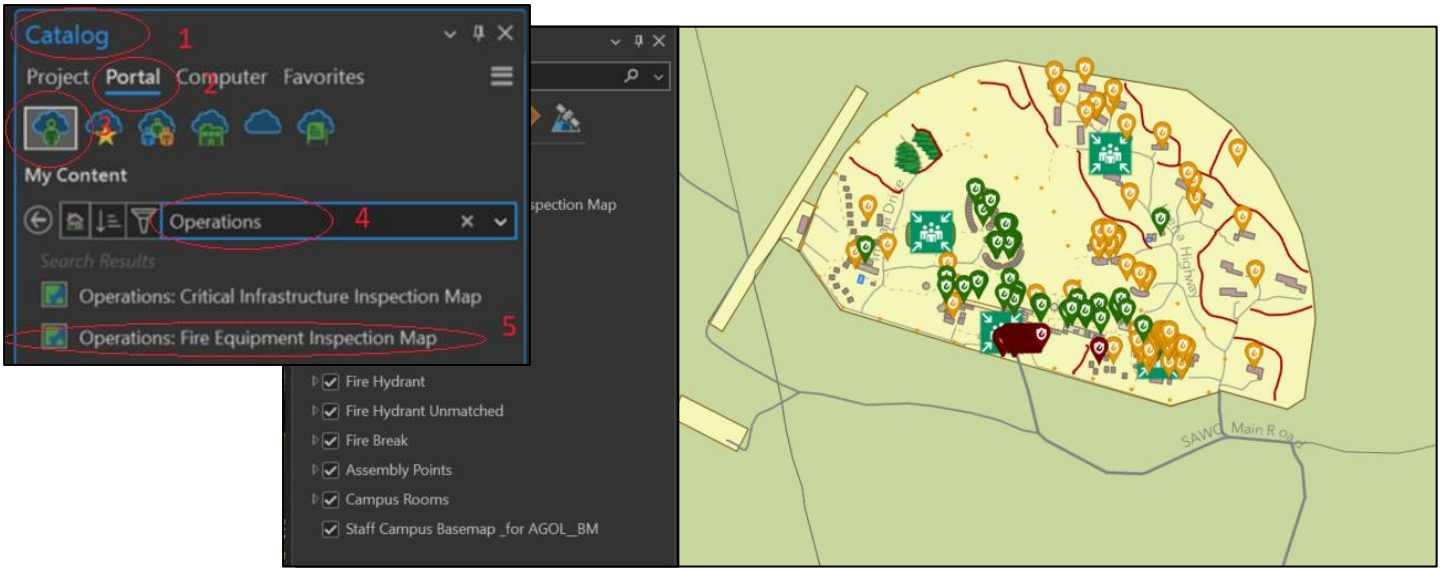


The relevant data has been uploaded to AGOL Online and can be found in the *'Operations: Fire Equipment Inspection Map'*. This can be accessed through two options:

- Viewed in *Map Viewer* in AGOL.

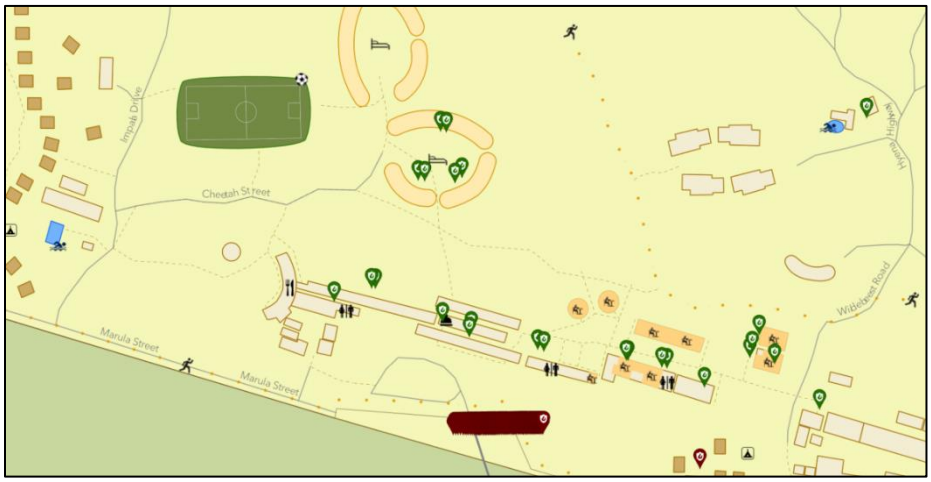


- Or added to an ArcGIS Pro project through the Catalog Pane > Portal > 'My Content' or 'My Groups' (depending on the data owner and sharing) > Search 'Operations' > Right click + 'Add and Open'



Switch off all the symbology except fire extinguishers. Note how there are green and red symbols. This symbology is currently set to the field 'InspectionDue' (field name) or 'Inspection Due? (Y/N)' (alias).

Notice that green symbology can be found around the campus, while red symbols are located at the bottom of the map, waiting for placement.

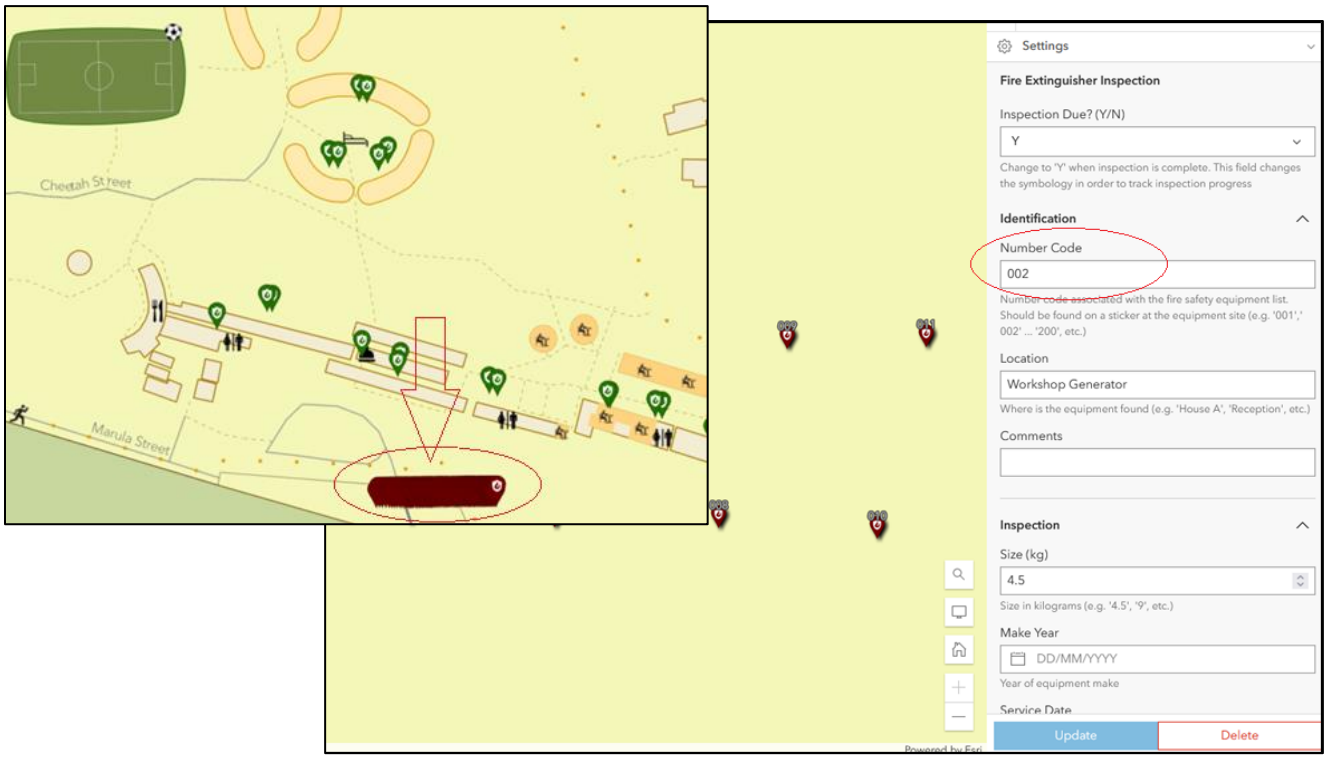


For now, all equipment on the list should be reviewed to ensure the applicable inspection results are included in the feature classes. Once this is complete, by keeping the symbology on this field, the map can be used to track the progress of inspections as they take place.

Zoom into one of the green markers and select it using the editing tab, and we see the data associated with it.

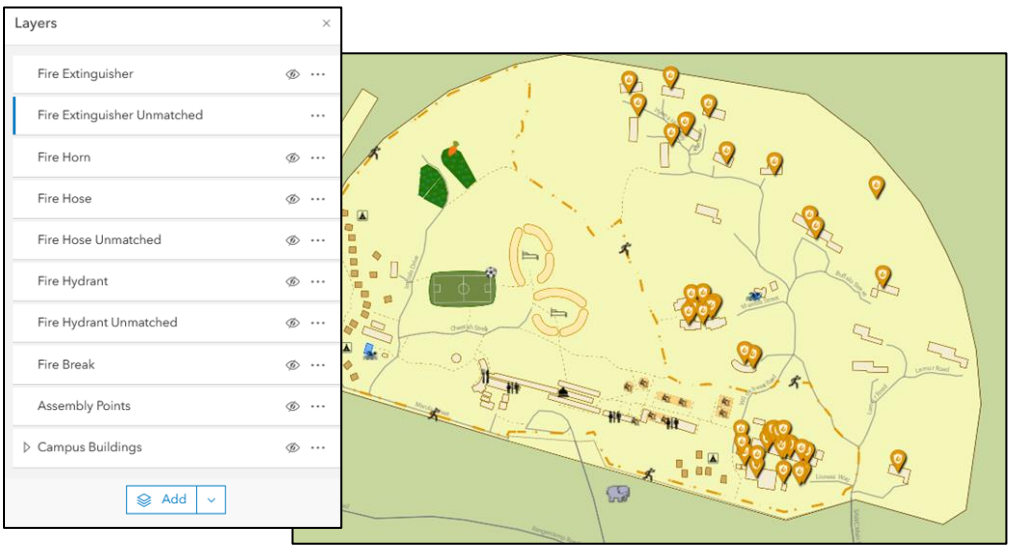
If we do this using Map Viewer in the AGOL Map viewer, the attribute data is presented as a form. This form was created in Field Maps and is the format that field technicians will see on their mobile

devices. Observe the unplaced equipment symbolized in red at the bottom of the map. Note that these still have associated number codes listing them to the OHS equipment list, and data filled in where information was available.



Field technicians can drag these points to the appropriate locations using Field Maps, as they are identified in the field (*see next section*). Alternatively, they can be dragged into their estimated location using the Map Viewer first, referencing their 'Location' field. The exact location can then be confirmed while in the field around campus, to make update process easier for field technicians.

Unmatched equipment layers are also included in this map, as well as the Life Safety Feature Dataset in the SAWC's File Geodatabase Library. These have not yet been confirmed in the field and are not representative of all the remaining unplaced fire equipment features.



Unmatched data comes from multiple sources, including the sewage and water pipe points, and an incomplete fire extinguisher .gpx file. In these instances, no provided fields in the data match the identifying code in the OHS Equipment list; requiring observation in field to confirm the associated record from the OHS equipment table.

These unmatched layers are intended for reference purposes only, to assist with the initial data preparation. They provide a reference to where fire equipment will likely be found. Once the records from the official feature classes are relocated to the appropriate locations, the unmatched data sets should be removed.

Preparing for inspections using Field Maps

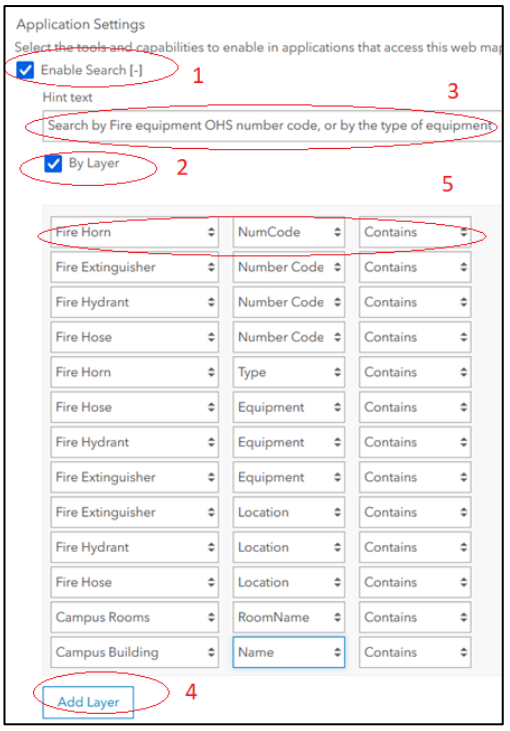
A Field Maps form for equipment inspection has been prepared in Field Maps Designer. The permissions can be set as desired.

Preparing for fire equipment inspections using Field Maps would occur in the same way as in the document *Field Surveys with Field Update Layers*, but without using intermediary 'Field Update' layers, and with some steps that are specific to the fire equipment data.

One difference with this Web map in AGOL, is that the search layers should be set to include the OHS Fire equipment number codes. This allows field technicians to quickly search for specific equipment while using Field Maps on their mobile device. To replicate this process:

- Follow the instructions in *Field Surveys with Field Update Layers* as required to create a group and ensure to update sharing appropriately.
- Click on the Settings section of the *'Operations: Fire Equipment Inspection Map' item page.*

- In the 'Application Settings' section, ensure that 'Enable Search' is selected.
- Select 'By Layer'
- Provide a hint for field technicians regarding what they can search for.
- Add each applicable layer
- Ensure the appropriate field(s) can be included in a search.
- Hit 'Save'.

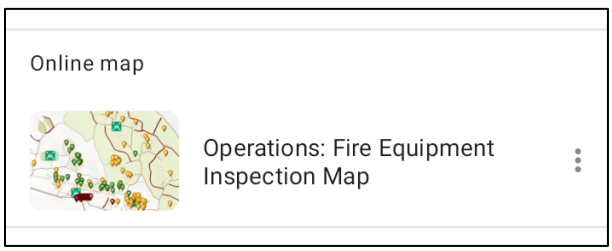


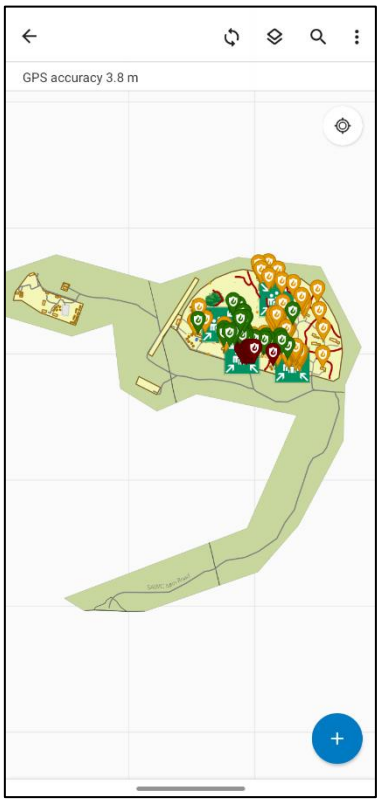
Correcting data and conducting inspections in Field Maps (*field technician*)

Accessing the Field Map

If the data owner has provided you with access to Field Maps, you can follow these instructions to update fire equipment data in field and/or complete an inspection.

- Open the 'Operations: Fire Equipment Inspection Map' in ArcGIS Field Maps on your mobile device. You can search for the map directly in your application or take a picture of the QR code below.

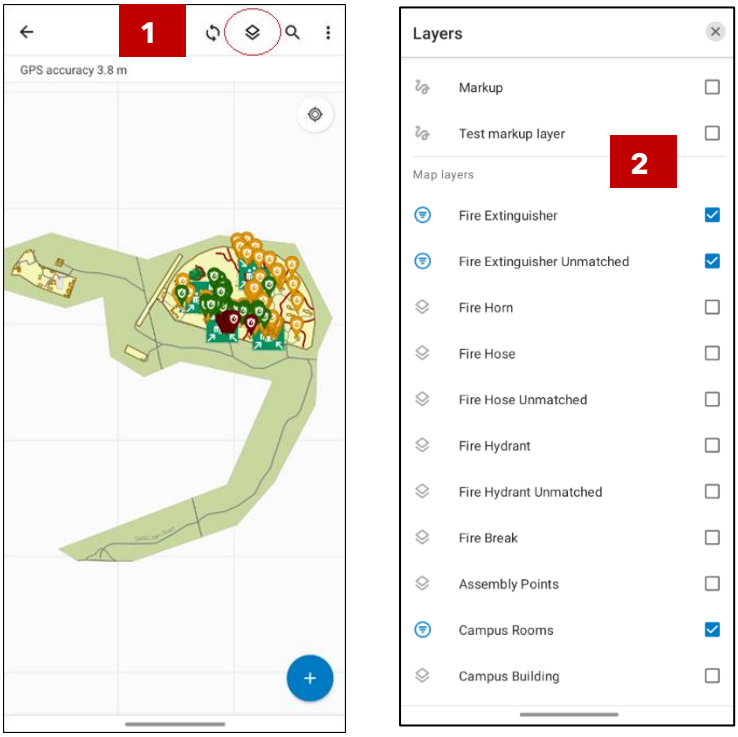




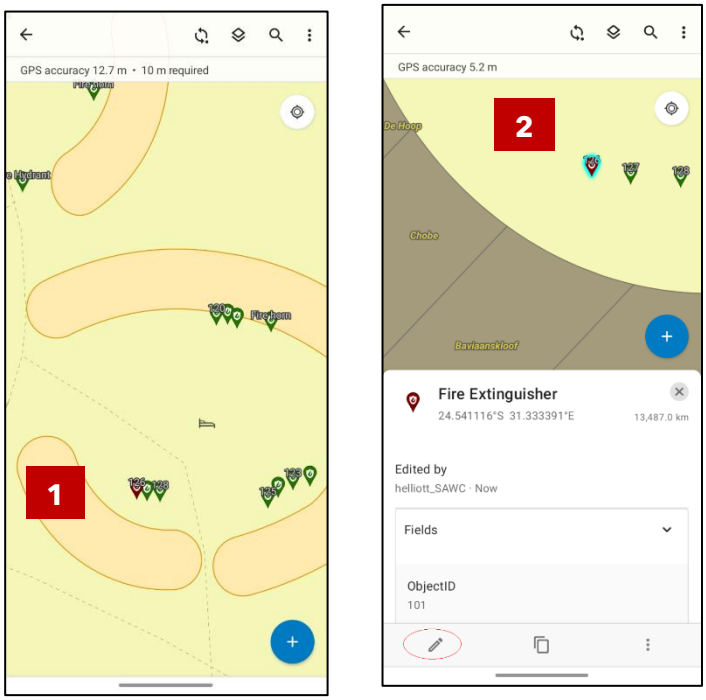
- Familiarize yourself with the map that shows up. An offline extent has been set for this area.

Conducting an inspection

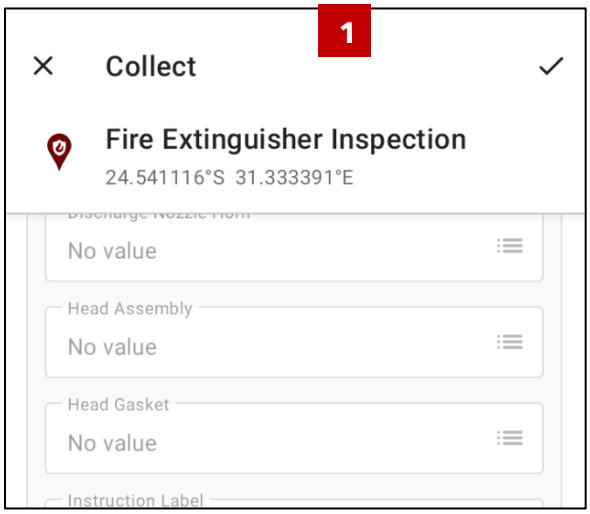
- *Optional:* Filter the data to the equipment you are interested in updating or conducting an inspection on. For this example, we are going to focus on fire extinguishers.

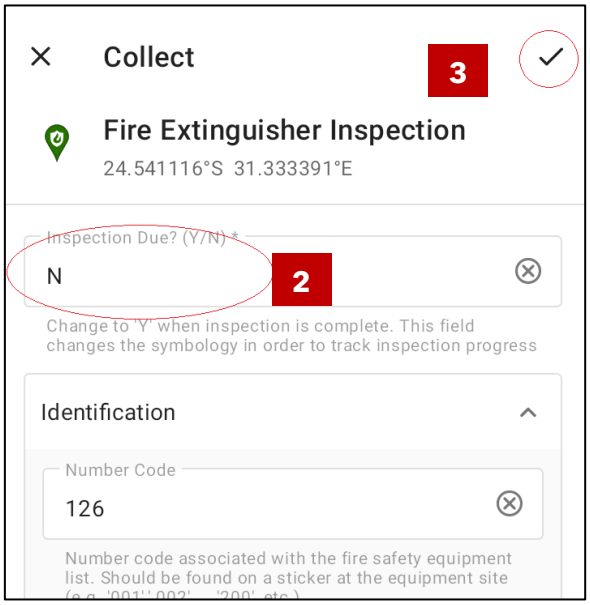


- Explore a fire extinguisher near you, then reference it in the Field Maps application. In this example, we are interested in inspecting fire extinguisher number 126, which should be found in Yellow Block.
- Click on the marker for this fire extinguisher (it should be labelled). Observe the attribute table that pops up.
- We know we want to inspect this extinguisher, so click on the pencil in the bottom left-hand corner.



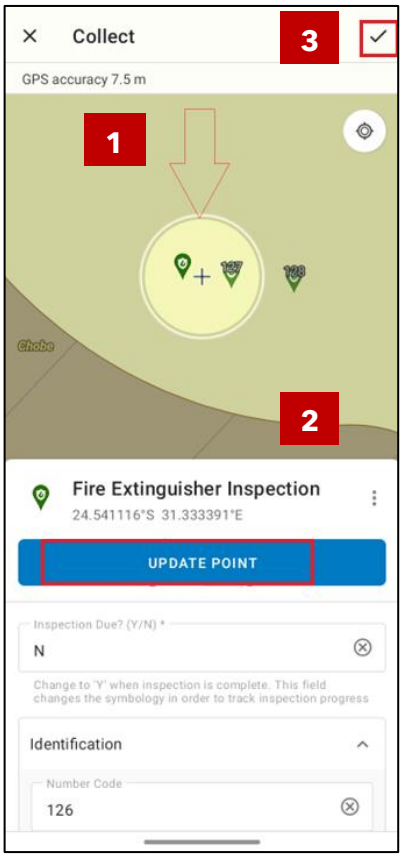
- Fill in the inspection form.
- Changing 'Inspection Due' from Y (short for yes) to N (short for no) changes the colour of the symbol from red to green.
- Once you are finished making updates, click the checkmark on the top right corner.





Moving a record

- If the marker does not appear to be in the correct position, select the feature and edit it just like in the last step.
- This time, drag the cross hair so that it is over the correct position.
- Click 'Update Point', and then the checkmark in the top right-hand corner.

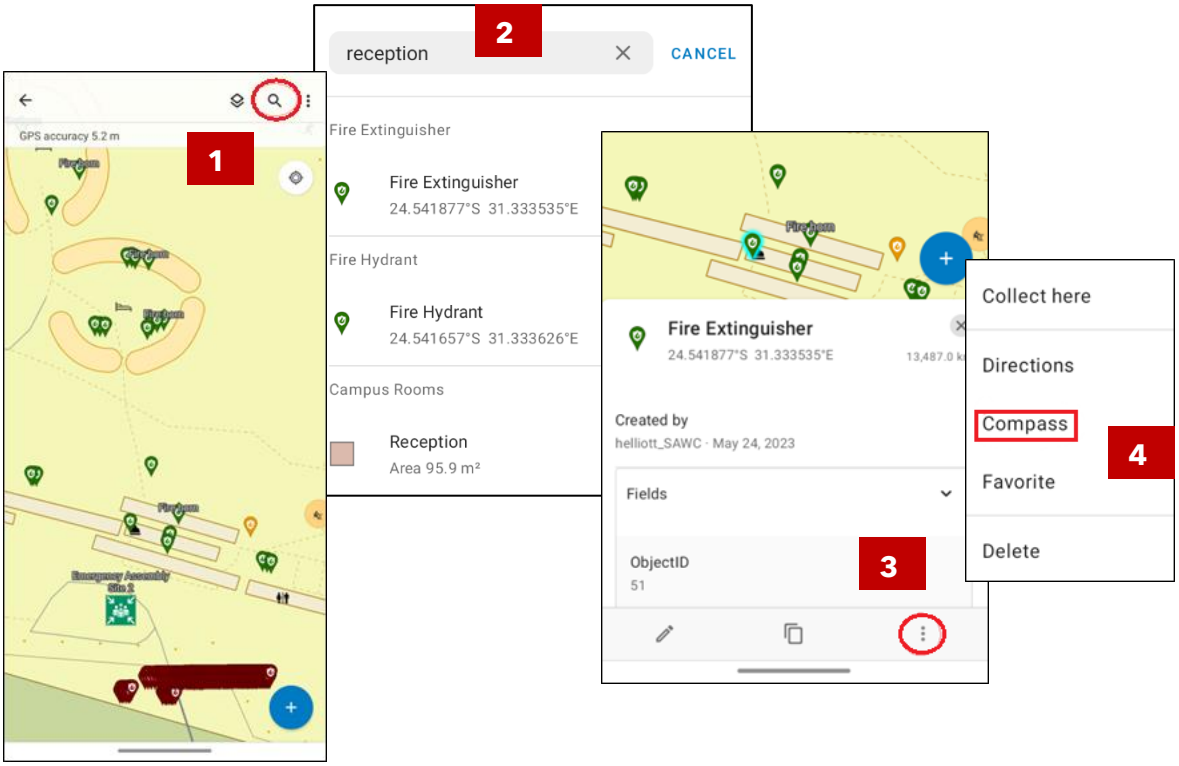


Searching in Field Maps

Now that we have updated the inspection form for one of the extinguishers, we are interested in updating the extinguisher at reception. But hypothetically, what if we did not know how to find this record? To save time, you could use the search bar.

- Select the magnifying glass in the top right corner, and search for "reception".

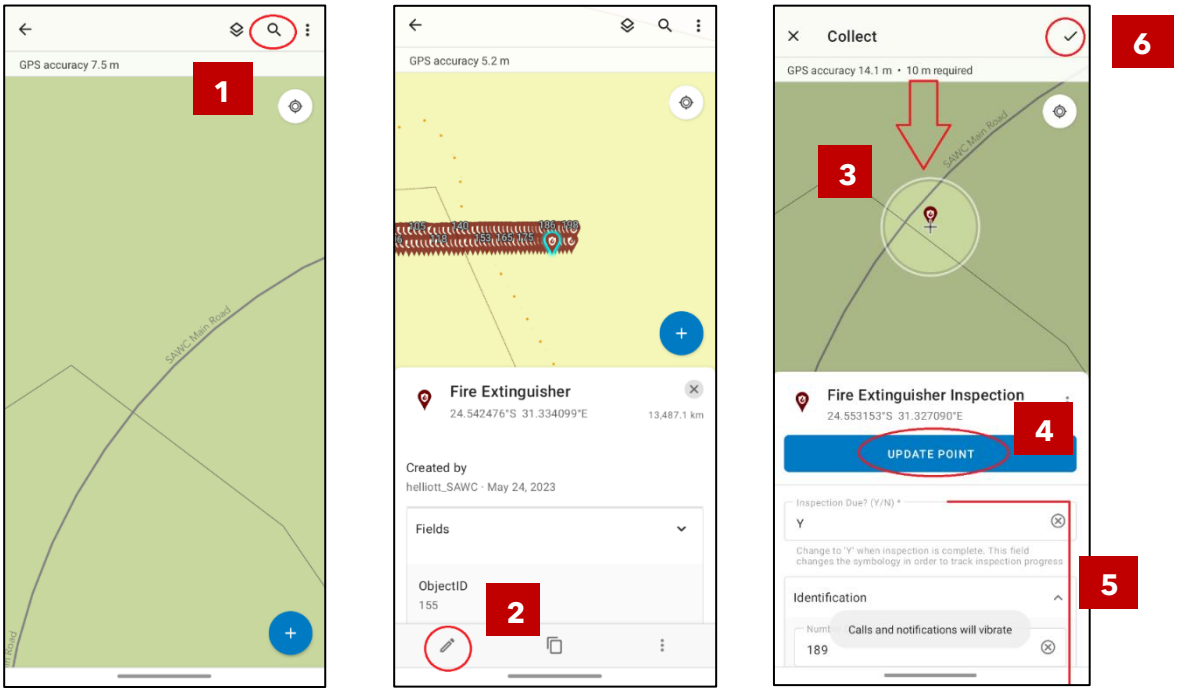
- Observe the results, a fire extinguisher, a fire hose, and a room have all shown up in the search results. Select the fire extinguisher, and it will be highlighted on your map.
- If you need help orienting yourself to it, select the ellipses button, and then select 'Compass'.



Moving unplaced equipment to the correct location

Next, we will cover moving unplaced equipment to the correct location once it has been observed in the field.

- Navigate to the SAWC Main Gate front entrance and find the fire extinguisher. It should have a sticker with a number on it. In this case, we may see that the fire extinguisher is number 189.
- Click the search button in the top right corner, and search for "189". Field Maps should find this fire extinguisher if it exists in the OHS equipment list.
- Click the edit button in the bottom left corner.
- Place the cross hairs over where the extinguisher is located, then click 'Update Point'.
- Fill in the rest of the inspection form.
- Click the checkmark in the top right-hand corner.

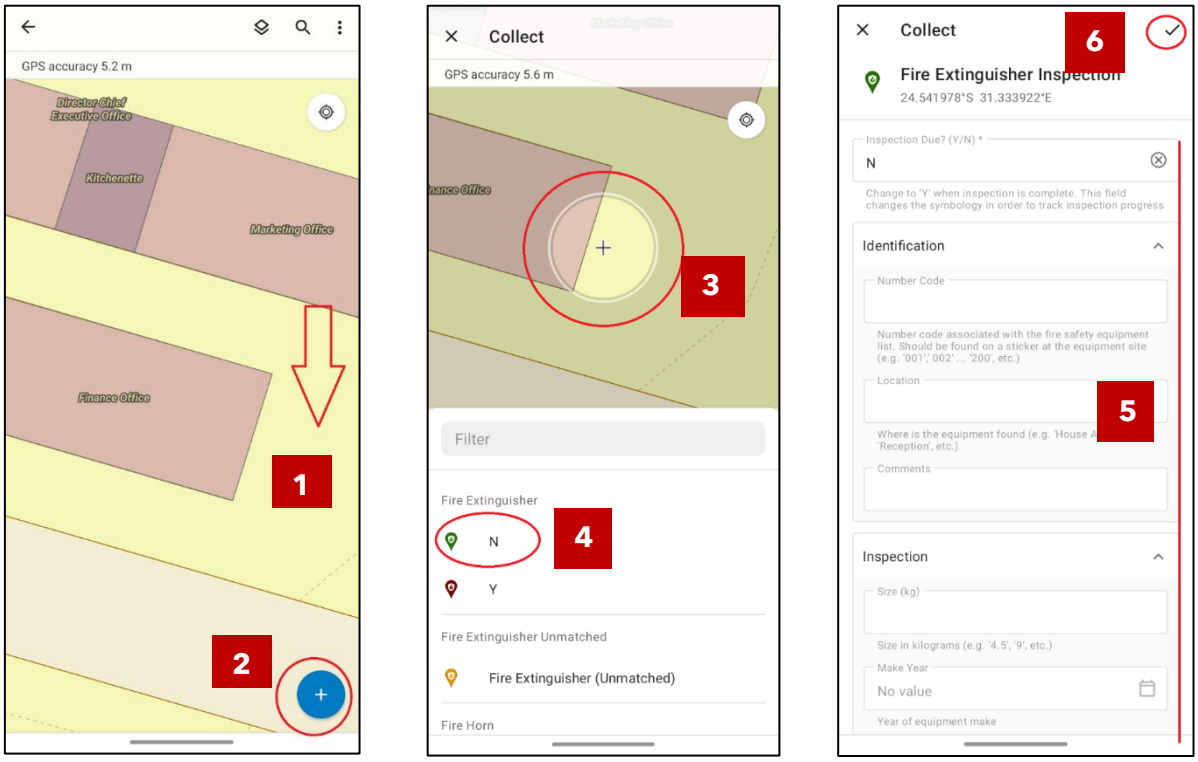


Creating a new record

If you discover a fire extinguisher that is not accounted for in the existing dataset or if this is a brand-new piece of equipment, you may need to add a new record.

For this example, we are placing a (fictional) new fire extinguisher outside the Finance office. You can follow along, but don't save your results unless this is for an actual new instance.

- Click on the blue button in the bottom right corner of the screen.
- Place the crosshairs over the location of the extinguisher.
- Select the correct feature to add. You may need to switch the layer to be visible if it is not otherwise.
- Fill in the inspection form, then click the checkmark in the top right corner.

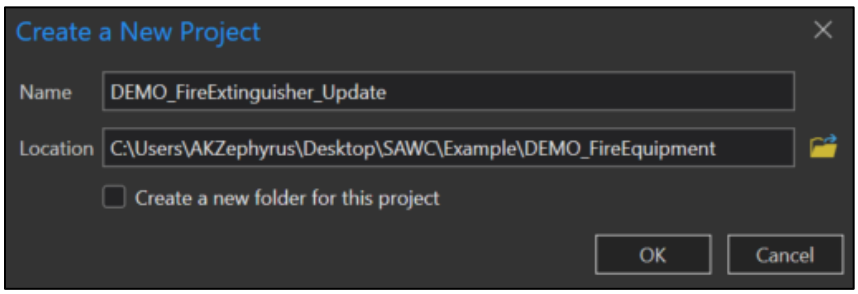


Updating the SAWC File Geodatabase Library and printing the evidence

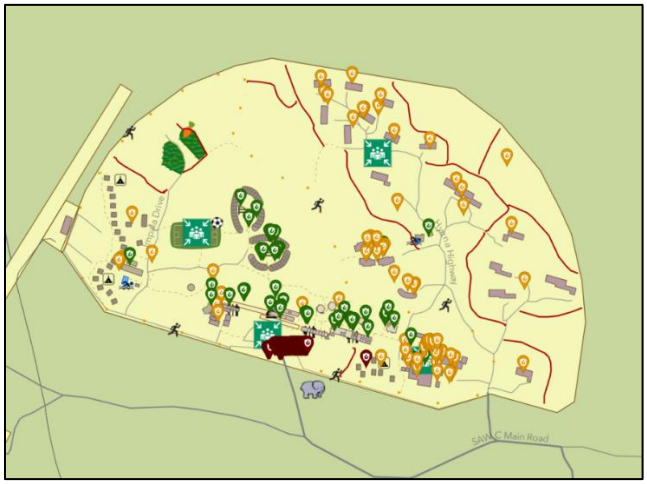
Importing the map and reviewing the inspection data

The data owner should be able to follow along with the inspection progress, by viewing the web map in Map Viewer, in AGOL. Once the inspection is complete and the data is synced, all the fire equipment symbology should be green, to reflect that no markers currently require inspection. The data should now be ready for review and exporting.

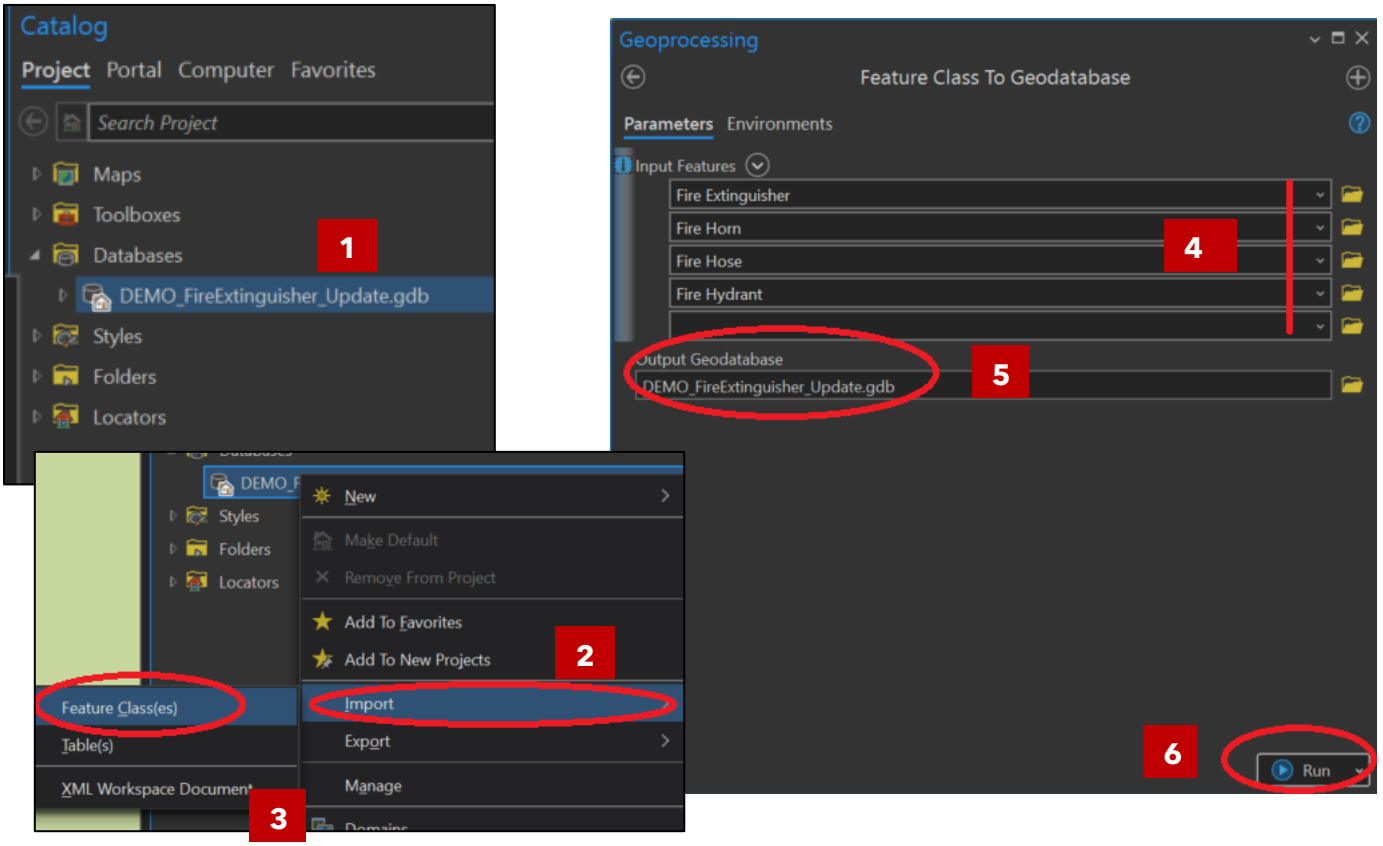
- Create a new ArcGIS Pro project or open an existing project.



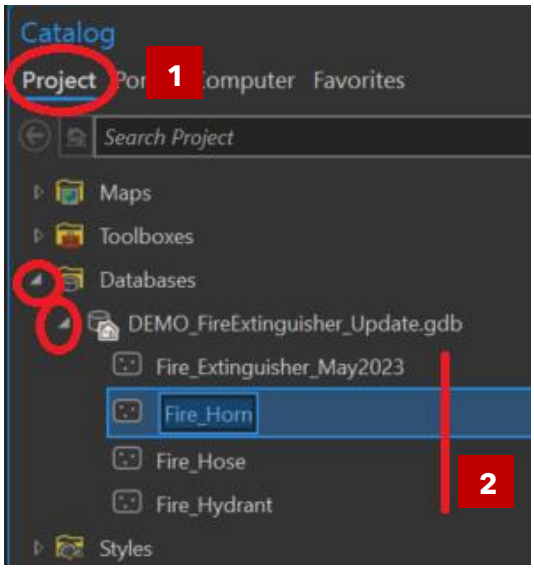
- In the Catalog pane, add the 'Operations: Fire Equipment Inspection Map', just as demonstrated in first section.
- Review the results and ensure everything looks correct and complete.
- If applicable: delete the records from the 'Unmatched' data layers, where they have been replaced by the appropriate markers. Once all markers have been located, the 'Unmatched' features can be deleted from the SAWC FGDB Database and from AGOL.



- Right click on the project FGDB and import the appropriate features classes.



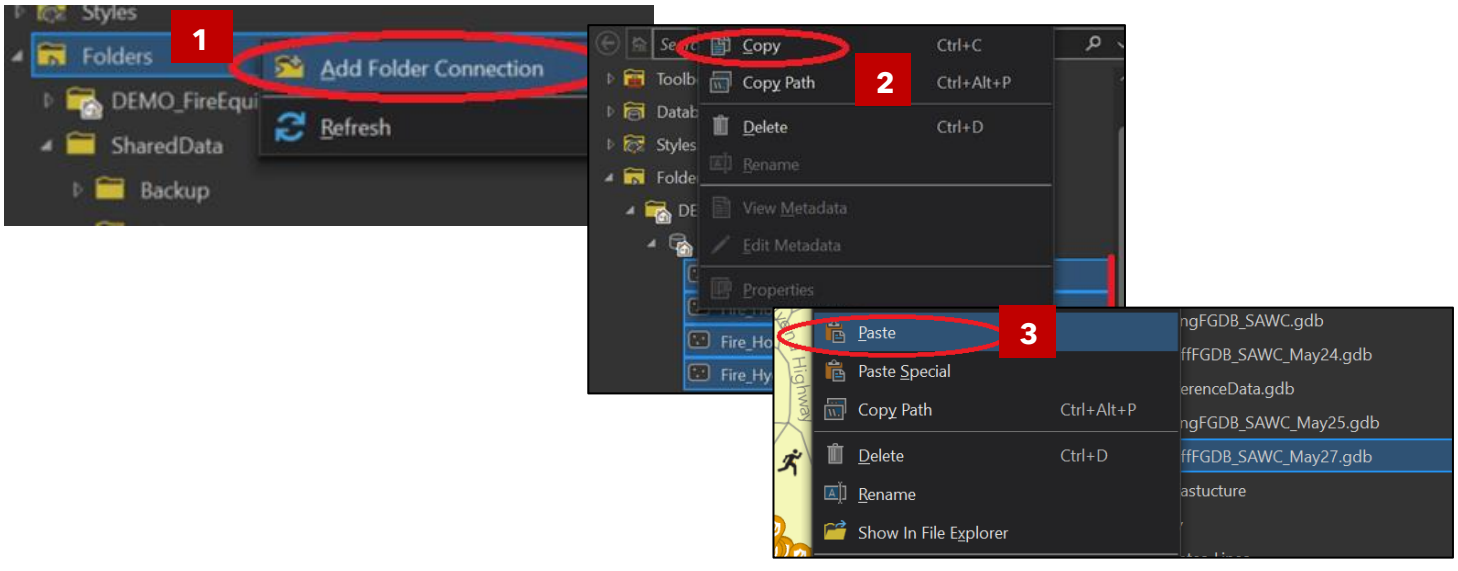
- In the Catalog Pane, expand 'Databases', and then the file geodatabase, to see the files you just imported. You may need to right click the file geodatabase and select refresh.
- Add the month and year to the name of the files, to distinguish from previous years (if auditing and demonstrating previous years data is important).



- Review the results and make any changes as required, providing quality control and assurance as the data owner.

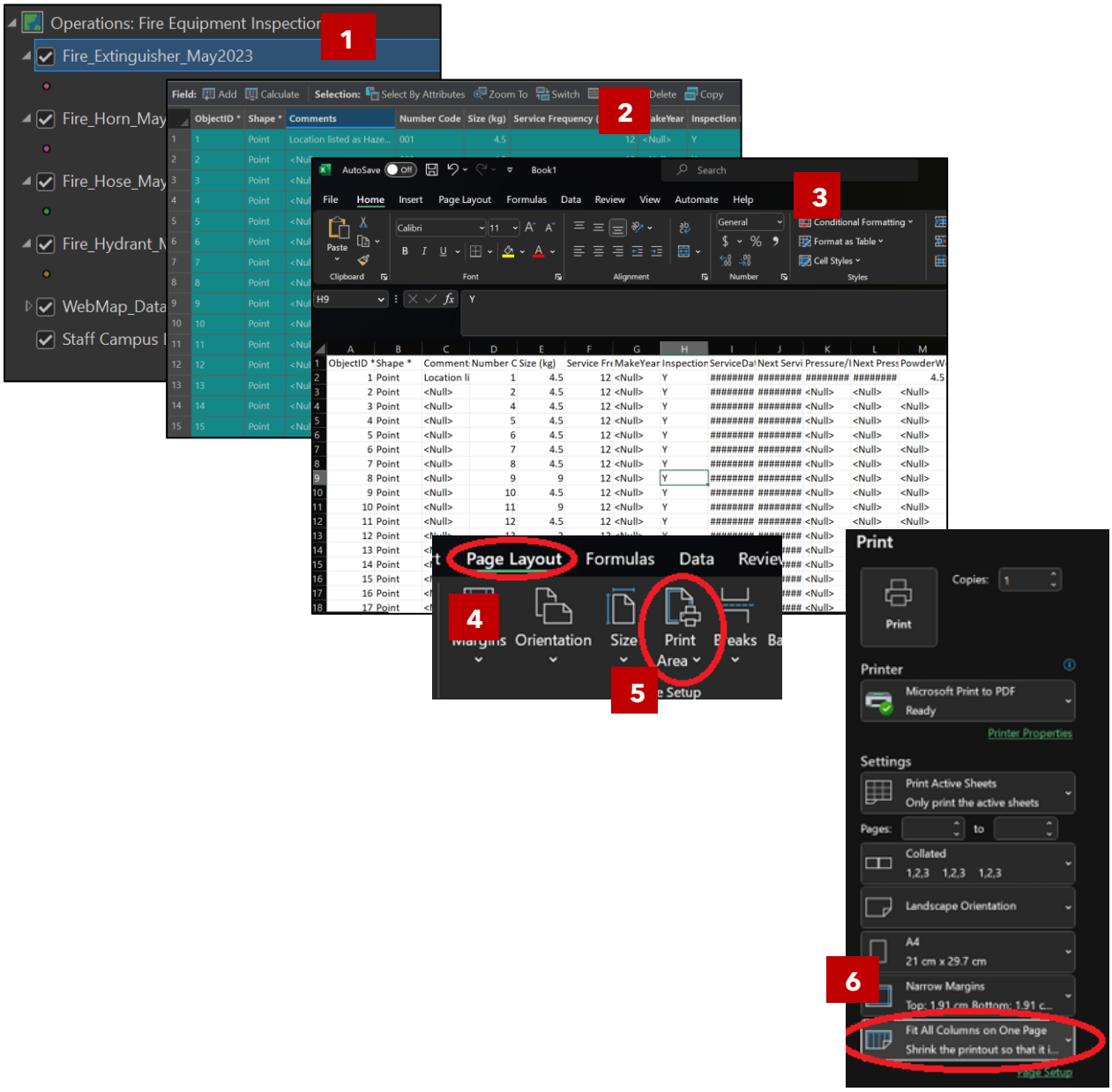
Exporting the data into SAWC FGDB Database

- In the Catalog pane, right click on 'Folders' and 'Add Folder Connection'.
- Add the path to the SAWC File Geodatabase.
- Select the new fire equipment feature classes in your project file geodatabase, right click, and Copy.
- Paste the feature classes with the naming inspection, into the Staff FGDB in the SAWC FGDB Library.



Printing a copy of the data for auditing

- Individually, open each feature classes' attribute table, select all the records, and select copy in the top right corner.
- Paste the results into an excel spreadsheet.
- Remove any unnecessary columns that aren't required for audit purposes (e.g. ObjectID).
- In Excel, select the 'Layout' tab in the top ribbon.
- Set the orientation to landscape.
- Select all the relevant data and click the 'Print Area' button.
- Press 'ctrl + p' in Excel to bring up the print menu.
- Ensure that the scale is set to fit all columns on the page.
- Print the results, and sign.



Associated project links

Fire Equipment Inspection Field Map

- *Field Maps Link (for phone)*

- *Webmap item link (SAWC AGOL)*
- *Webmap map viewer link (SAWC AGOL)*

Other resources

- SAWC Document: *Field Surveys with Field Update Layers*
- SAWC Document: *SAWC GIS Instruction Package*
- ArcGIS Documentation: *Field Maps Tutorials*