Using GIS for Confined Space Safety

ESRI Water Conference 2018

Kaitlin Szedlar – GIS Technician

Agenda

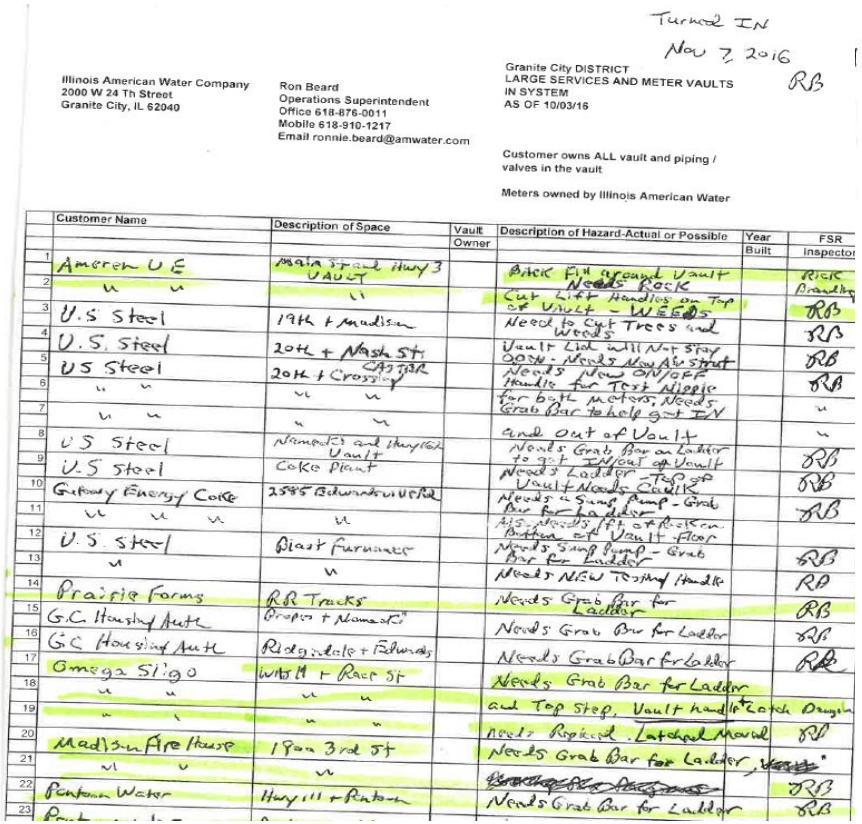
- Background
- Creation, Implementation, Management, & Continuous Improvement
- Confined Space Data : Current State vs Confined Space Safety Application
- Questions

Background

- Southern Division Health & Safety Committee
- Issue introduced by field crew members, district supervisors, & safety professionals:

- **At Illinois American Water large customer vaults are not company owned. However, we are required to enter the vaults & perform meter testing on an annual basis. Because we do not own and therefore are not responsible for the maintenance of these vaults, the condition of many of them has deteriorated in ways that present safety concerns to our employees.**

Paper Forms



Turned IN
Nov 7, 2016
RB

Illinois American Water Company
2000 W 24 Th Street
Granite City, IL 62040

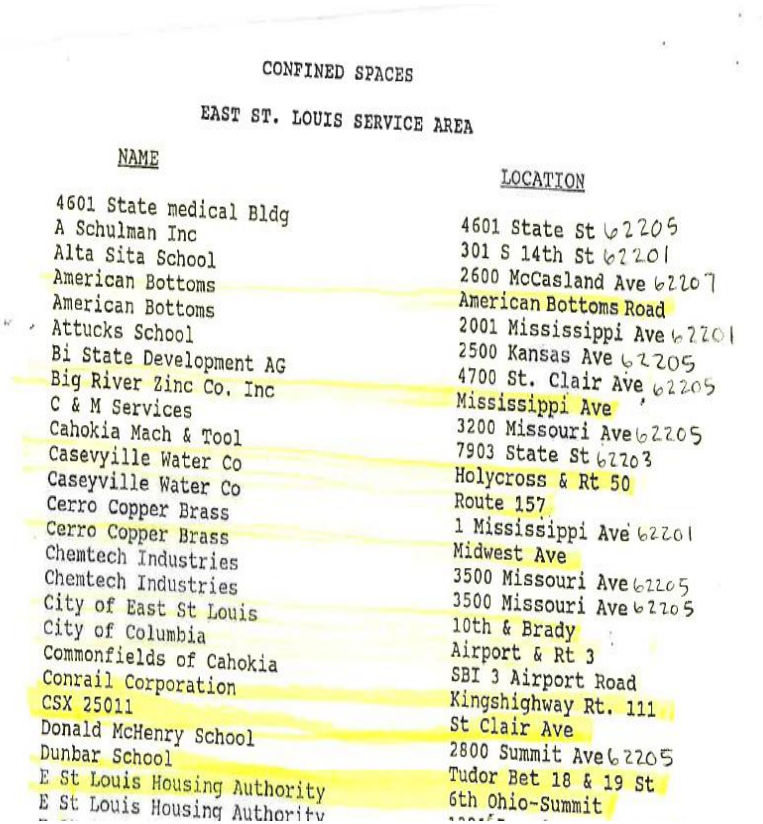
Ron Beard
Operations Superintendent
Office 618-876-0011
Mobile 618-910-1217
Email ronnie.beard@amwater.com

Granite City DISTRICT
LARGE SERVICES AND METER VAULTS
IN SYSTEM
AS OF 10/03/16

Customer owns ALL vault and piping / valves in the vault

Meters owned by Illinois American Water

	Customer Name	Description of Space	Vault Owner	Description of Hazard-Actual or Possible	Year Built	FSR Inspector
1	Ameren U E	Main St and Hwy 3 VAULT		Back Fill around Vault Needs Rock		Rick Brandling
2	" "	"		Cut Lift Handles on Top of Vault - WEEDS		RB
3	U.S Steel	19th + Madison		Need to Cut Trees and Weeds		RB
4	U.S. Steel	20th + Nash St		Vault Lid will Not Stay OPEN - Needs New Air Strut		RB
5	US Steel	20th + Crossing CASTER		Needs New ON/OFF Handle for Test Nipple		RB
6	" "	" "		for both meters, Needs Grab Bar to help get IN		"
7	" "	" "		and Out of Vault		"
8	U S Steel	Nameoki and Hwy 16th Vault		Needs Grab Bar on Ladder to get IN/out of Vault		RB
9	U.S Steel	Coke Plant		Needs Ladder - Top of Vault Needs Caulk		RB
10	Gateway Energy Coke	2585 Edwards Ave Rd		Needs a Sump Pump - Grab Bar for Ladder		RB
11	" " "	"		Air Needs 1 ft of Rock on Bottom of Vault Floor		
12	U.S. Steel	Blast Furnace		Needs Sump Pump - Grab Bar for Ladder		RB
13	"	"		Needs NEW Testing Handle		RB
14	Prairie Forms	RR Tracks		Needs Grab Bar for Ladder		RB
15	G.C. Housing Auth	Propes + Nameoki		Needs Grab Bar for Ladder		RB
16	G.C Housing Auth	Ridgedale + Edwards		Needs Grab Bar for Ladder		RB
17	Omega Sligo	WASH + Race St		Needs Grab Bar for Ladder		RB
18	" "	" "		and Top Step, Vault handle + Latch Dangerous		
19	" "	" "		needs Replaced. Latched Moved		RB
20	Madison Fire House	1800 3rd St		Needs Grab Bar for Ladder, ~~[illegible]~~		
21	" "	"		~~[illegible]~~		RB
22	Pontoon Water	Hwy 111 + Pontoon		Needs Grab Bar for Ladder		RB
23	[illegible]	[illegible]		[illegible]		



CONFINED SPACES

EAST ST. LOUIS SERVICE AREA

NAME	LOCATION
4601 State medical Bldg	4601 State St 62205
A Schulman Inc	301 S 14th St 62201
Alta Sita School	2600 McCasland Ave 62207
American Bottoms	American Bottoms Road
American Bottoms	2001 Mississippi Ave 62201
Attucks School	2500 Kansas Ave 62205
Bi State Development AG	4700 St. Clair Ave 62205
Big River Zinc Co. Inc	Mississippi Ave
C & M Services	3200 Missouri Ave 62205
Cahokia Mach & Tool	7903 State St 62203
Casevyille Water Co	Holycross & Rt 50
Caseyville Water Co	Route 157
Cerro Copper Brass	1 Mississippi Ave 62201
Cerro Copper Brass	Midwest Ave
Chemtech Industries	3500 Missouri Ave 62205
Chemtech Industries	3500 Missouri Ave 62205
City of East St Louis	10th & Brady
City of Columbia	Airport & Rt 3
Commonfields of Cahokia	SBI 3 Airport Road
Conrail Corporation	Kingshighway Rt. 111
CSX 25011	St Clair Ave
Donald McHenry School	2800 Summit Ave 62205
Dunbar School	Tudor Bet 18 & 19 St
E St Louis Housing Authority	6th Ohio-Summit
E St Louis Housing Authority	

Excel Spreadsheets

	A	B	C	D	E	F	G	H	I	J	K
956	2" and larger	9090064293	15 Judith Ln	Cahokia	Domestic Water	East St Louis	4	7000040423	#N/A	#N/A	
957	2" and larger	9090064278	0 Mississippi Ave	Sauget	Master/Battery w/al	East St Louis	4	7000040324	210000922655	Solutia Inc	
958	2" and larger	9090064266	7 Mobile Ave	Sauget	Master/Battery w/al	East St Louis	4	7000040264	210004455775	Trade Waste Incineration	
959	2" and larger	9090064265	10 Mobile Ave	Sauget	Domestic Water	East St Louis	4	7000040256	210004455348	Sauget Sewerage	Vault
960	2" and larger	9090064262	2401 Mississippi Ave	Sauget	Master/Battery w/al	East St Louis	4	7000040209	220010412985	Jet Enterprises and Holding LL	Vault
961	2" and larger	9090064229	0 Van Buren Ave	East Saint Louis	Domestic Water	East St Louis	4	7000033453	210004122167	E St Louis Housing Authority	
962	2" and larger	9090060109	9400 Lebanon Rd	East Saint Louis	Domestic Water	East St Louis	4	7000191096	210002820380	Call For Help	Vault
963	2" and larger	9090056769	4901 State St	East Saint Louis	Domestic Water	East St Louis	4	7000217152	210003054384	E St Louis School Dist #189	Vault
964	2" and larger	9090055939	2901 St Clair Ave	East Saint Louis	Domestic Water	East St Louis	4	7000114224	210001820271	Bi State Development Agency	Vault
965	2" and larger	9090043713	220 S Front St	East Saint Louis	Domestic Water	East St Louis	4	7000204143	210002167621	Casino Queen Hotel	Vault
966	2" and larger	9090043583	6400 Collinsville Rd	FAIRMONT CITY	Domestic Water	East St Louis	4	7000167870	210001749747	Petra Industries Inc	Vault
967	2" and larger	9090039754	737 Locust St	East Saint Louis	Domestic Water	East St Louis	4	7000121543	220008406925	Progressive Treatment Solution	
968	2" and larger	5000020383	1021 W E St	Belleville	Domestic Water	Belleville	4	7003414189	220007231296	St Pauls Home For The Aged	Vault
970	2" and larger	9090331803	3700 Round Hill Rd	Swansea	Domestic Water	Belleville	6	7000269203	220000664154	Crystal Lake Partners Llc	Vault
971	2" and larger	9090304542	704 N Green Mount Rd	Shiloh	Domestic Water	Belleville	6	7000273054	210000923849	Faith Family Church	Vault
972	2" and larger	9090065592	6627 State Route 158	Millstadt	Domestic Water	Belleville	6	7000191108	210002533686	Millstadt Greenhouse	Vault
977	2" and larger	9090064270	3300 Mississippi Ave	East Saint Louis	Domestic Water	East St Louis	6	7000040293	210004457924	Conoco Phillips Pipe Line	Vault
978	2" and larger	9090064268	1 American Bottom Rd	Sauget	Master/Battery w/al	East St Louis	6	7000040283	210001186179	American Bottoms Sewer Auth	Vault
979	2" and larger	5000020211	2500 Carlyle Ave	Belleville	Domestic Water	Belleville	8	7003414016	220003678503	Southwestern Illinois College	Vault
980	2" and larger	9090065802	9601 St Clair Ave	Fairview Hts	Domestic Water	East St Louis	.675	7000212313	210004017678	IL Dept of Transportation	
987	2" and larger	9090064279	0 Falling Springs Rd	Sauget	Master/Battery w/al	East St Louis	.675	7000040345	210002064654	Afton Chemical Corporation	
988	2" and larger	9090064275	1 Mississippi Ave	East Saint Louis	Master/Battery w/al	East St Louis	.675	7000040310	210004532535	Cerro Flow Products Inc	

Employee Experience/Knowledge

Creation

- **Acquire current state data and standardize as much as possible**
- **Geocode addresses of confined spaces (when possible)**
  - **Geocoding** : Input addresses, GIS generates a point for each address
  - This provided a starting point
  - The rest of the data will be created by end users

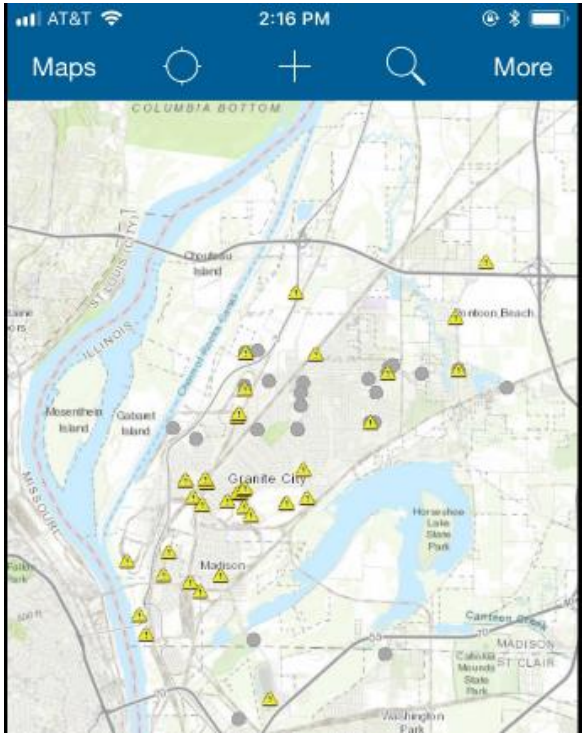
Creation

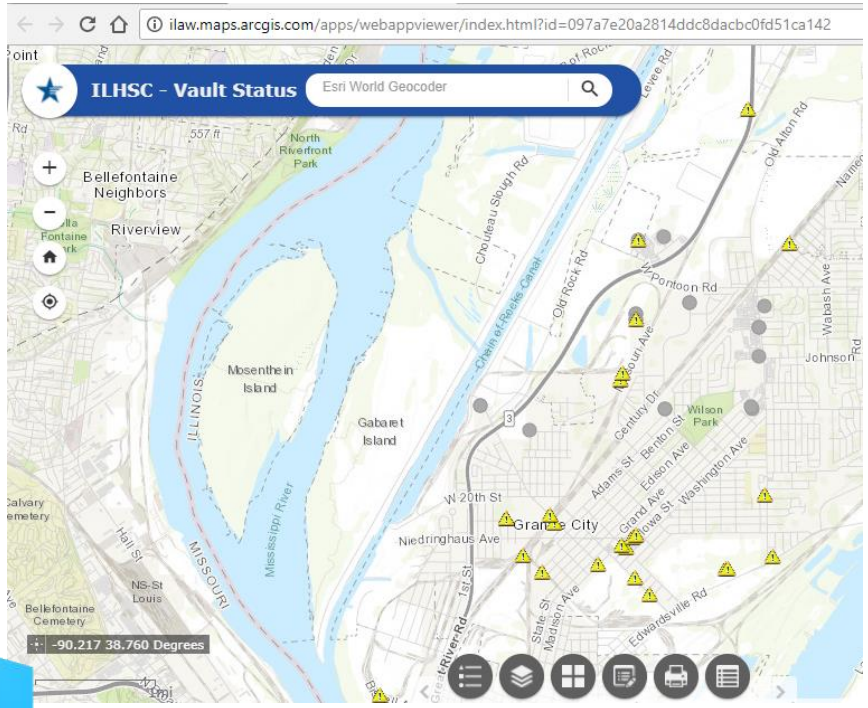
- **Work with safety professionals, managers, supervisors, and field crews to determine what attribute information is needed**

Address	City	District	Comments	Install Date	Vault Status
Vault ID	Name	Hyperlink	Company Owned	Creator	Edit Date
# of meters	Valve/Meter Size	Correction Request Letter Sent?	Permit Required?	Data Source Type	Safety Hazard Notes

Creation

- **Accessible on the web or a free app (mobile device or tablet)**



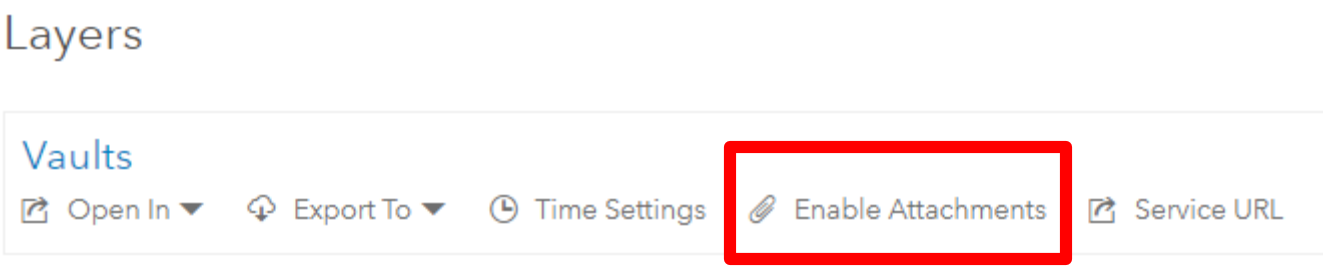


- **Create a web map in ArcGIS Online – No coding required**

Creation

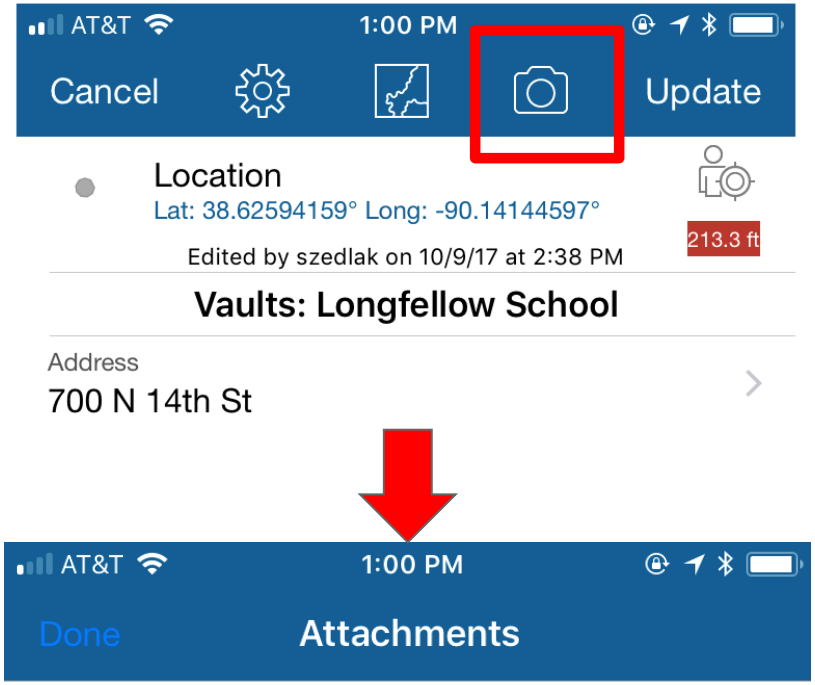
- **Enable Attachments**
- **Done in ArcGIS Online**
  - Hosted Feature service
  - View Item Details
  - “Enable Attachments”

- **Allows users to add and view images and/or documents**



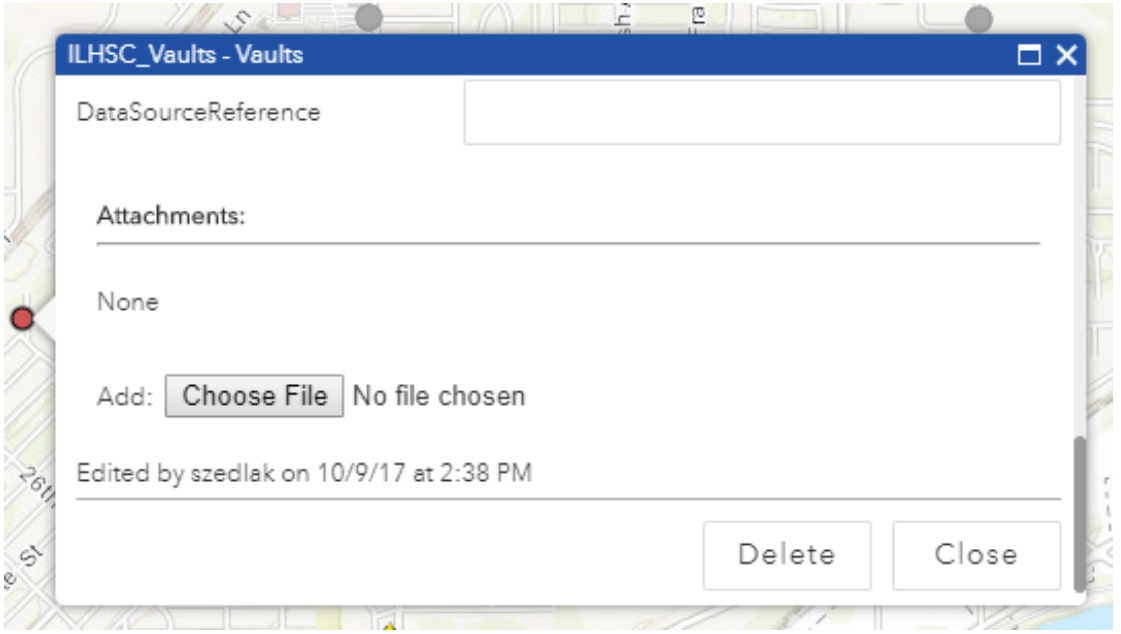
Images

- **Users can add images using the camera on their smartphone or tablet in the field**



Images

- Users can add images or documents using the web application
- Ex. Image of broken lid
- Ex. Confined space entry permit document



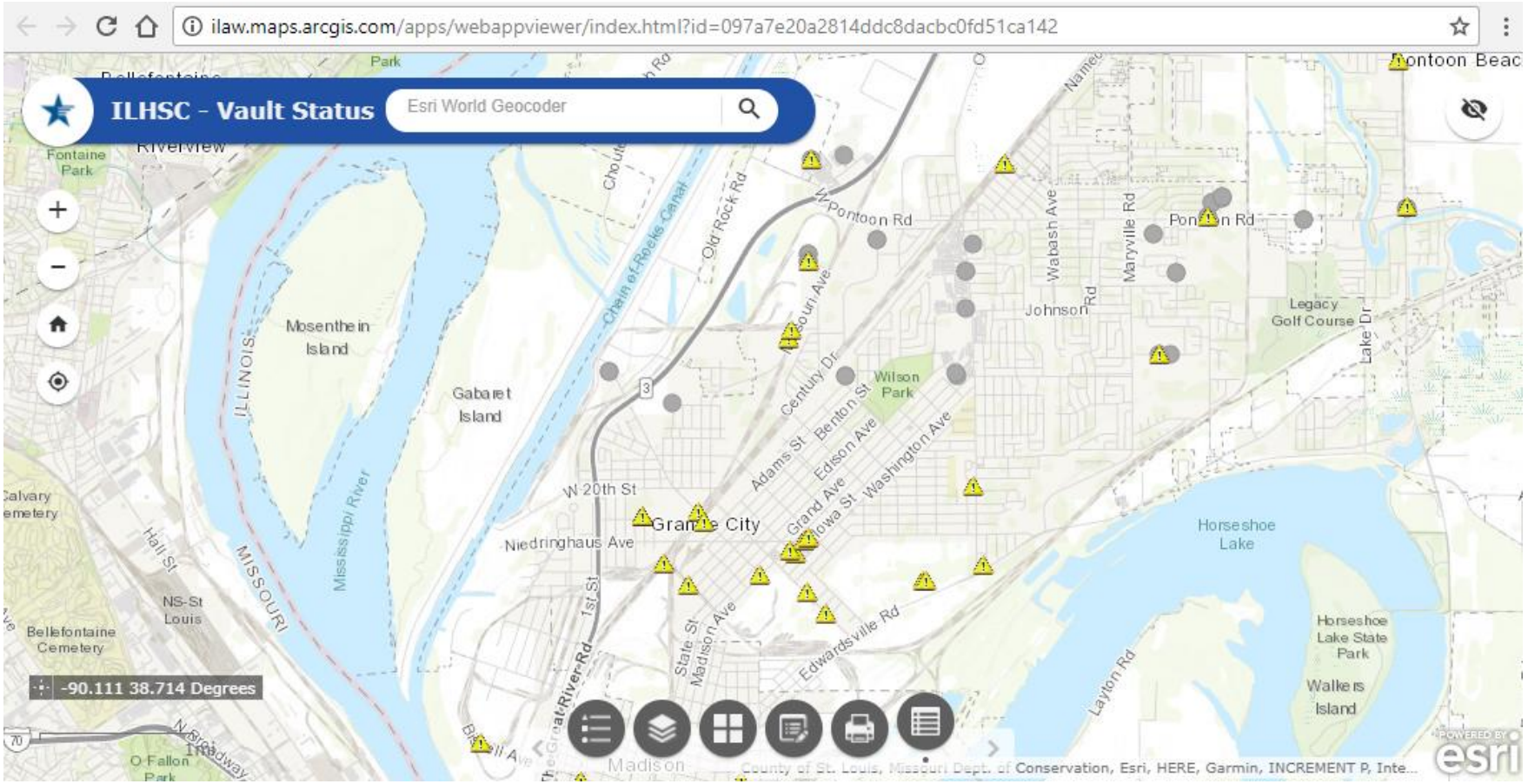
Management

- Creation, Management, and Training were all done by a single user
- Once created, data is owned by the end user and requires very little maintenance
- A backup of the data is created monthly

Training/Deployment

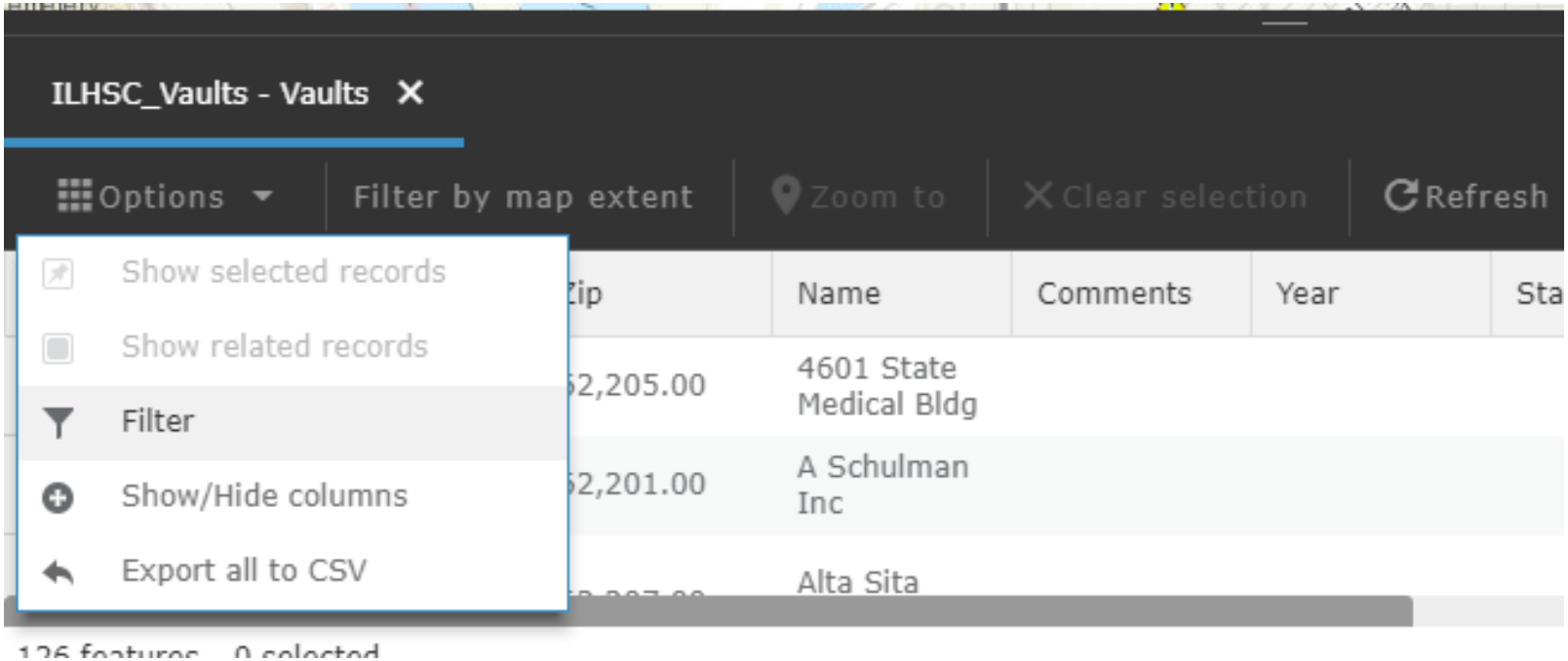
- Scheduled at the beginning of regularly scheduled annual inspections
- ½ day of training
- 30 minutes in the office reviewing the basics of the applications
- Hands on training in the field during inspection route for remainder of the session

Office Use


ilaw.maps.arcgis.com/apps/webappviewer/index.html?id=097a7e20a2814ddc8dacbc0fd51ca142
ILHSC - Vault Status
Esri World Geocoder
Fontaine Park
Riverview
Mosenthein Island
Gabaret Island
ILLINOIS
MISSOURI
Mississippi River
Chain of Rocks Canal
Old Rock Rd
Pontoon Rd
Wabash Ave
Maryville Rd
Johnson Rd
Legacy Golf Course
Lake Dr
Century Dr
Adams St
Benton St
Wilson Park
Edison Ave
Grand Ave
Iowa St
Washington Ave
W 20th St
Granite City
Niedringhaus Ave
1st St
State St
Madison Ave
Edwardsville Rd
Layton Rd
Horseshoe Lake
Horseshoe Lake State Park
Walkers Island
Hall St
NS-St Louis
Bellefontaine Cemetery
Calvary Cemetery
O'Fallon Park
Madison
-90.111 38.714 Degrees
County of St. Louis, Missouri Dept. of Conservation, Esri, HERE, Garmin, INCREMENT P, Inte...
esri

Office Use

- **State decision makers and safety professionals may want to see statewide data, while local supervisors may only be concerned with data for the specific town(s) that they manage.**



Current State

- Records stored in different formats in each district : Excel spreadsheets, paper forms, & employee knowledge
- Vulnerable to aging workforce
- Difficult for safety professionals & management to view statewide data

GIS Confined Space Safety App

- Single repository for confined space information
- Information readily available for field crews, safety professionals, & management to view or Export a report to Excel
- Crews can check notes from prior year to be more prepared for the job from a mobile phone, computer, or tablet
- Employees are empowered to add new assets or change attribute information

Benefits

Short Term

- Field employees are more aware of hazards and have a place to document new developments in real time using a computer, smartphone, or tablet

Long Term

- Office managers and safety professionals can easily generate reports within the application and leverage this information to work with vault owners toward a long term solution to the safety concerns

Continuous Improvement

- As each new district goes live we receive new attribute suggestions and other recommendations
- This platform makes these improvements simple and allows us to be responsive to our users needs

ANY
QUESTIONS
?