Using the Emergency Response Guide Widget

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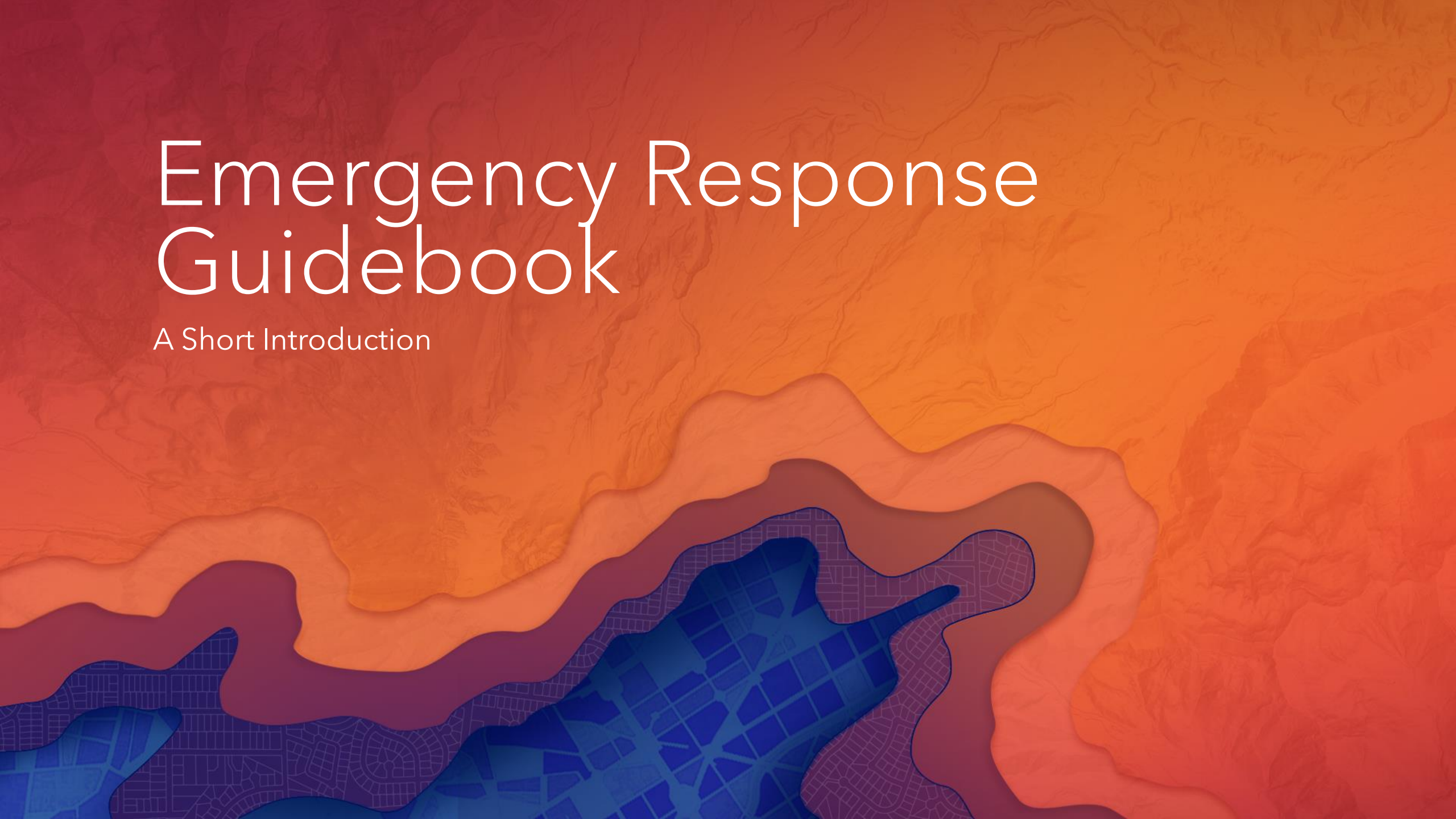
Agenda

- Emergency Response Guidebook
  - History
  - Components
- Emergency Response Guide Widget
  - Development
  - Updates
- Demonstration
- Upcoming
- Questions

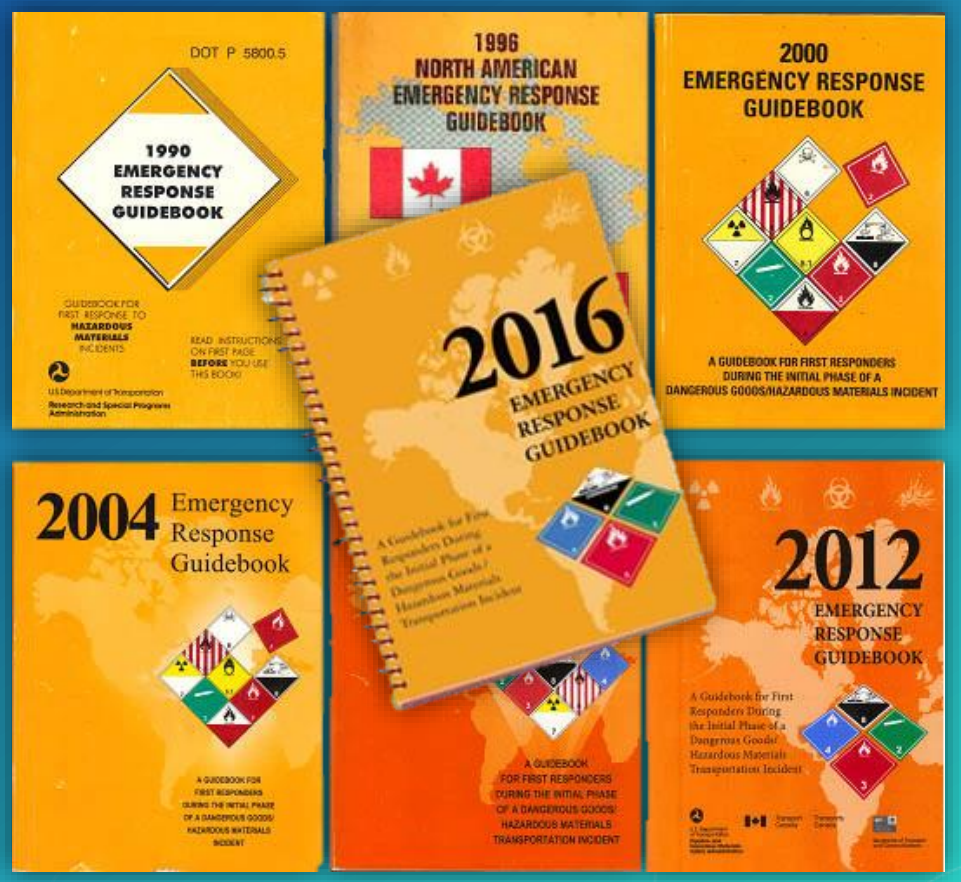
Emergency Response Guidebook

A Short Introduction



History

- First published in 1978
- Updated every four years
- Developed by US Department of Transportation
- Joint effort between:
  - United States
  - Canada
  - Mexico
  - Argentina



Components

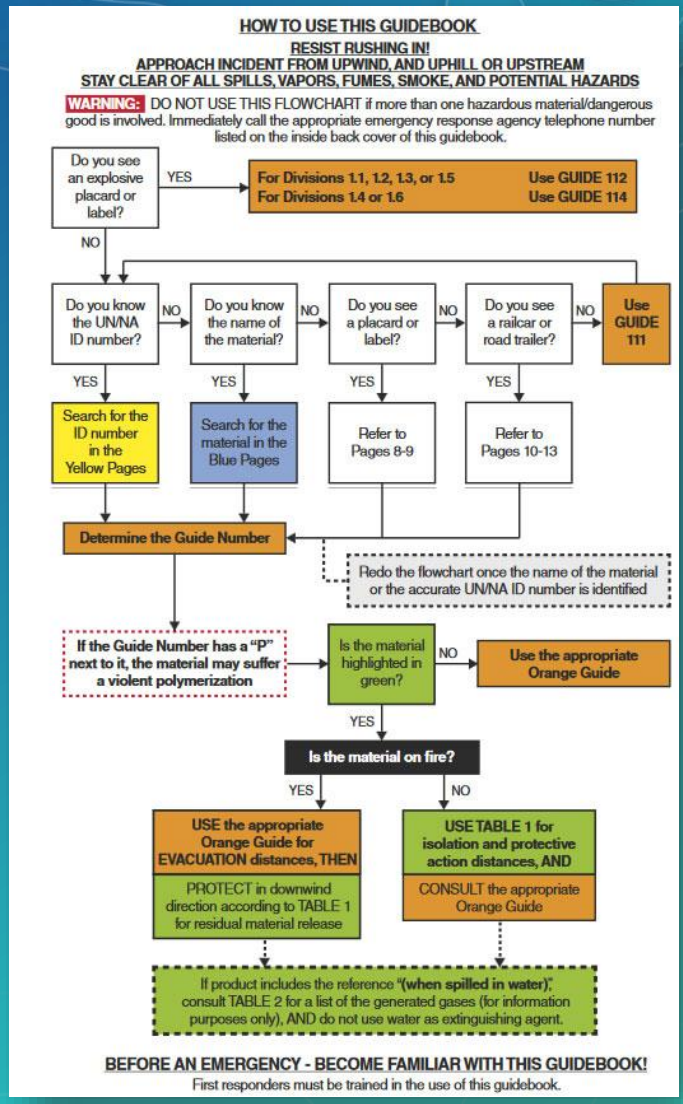
The ERG is broken into five sections:

- White – Information
- Yellow – Reference
- Blue – Reference
- Orange – Response
- Green – Distances
- White – Information (again)

Components

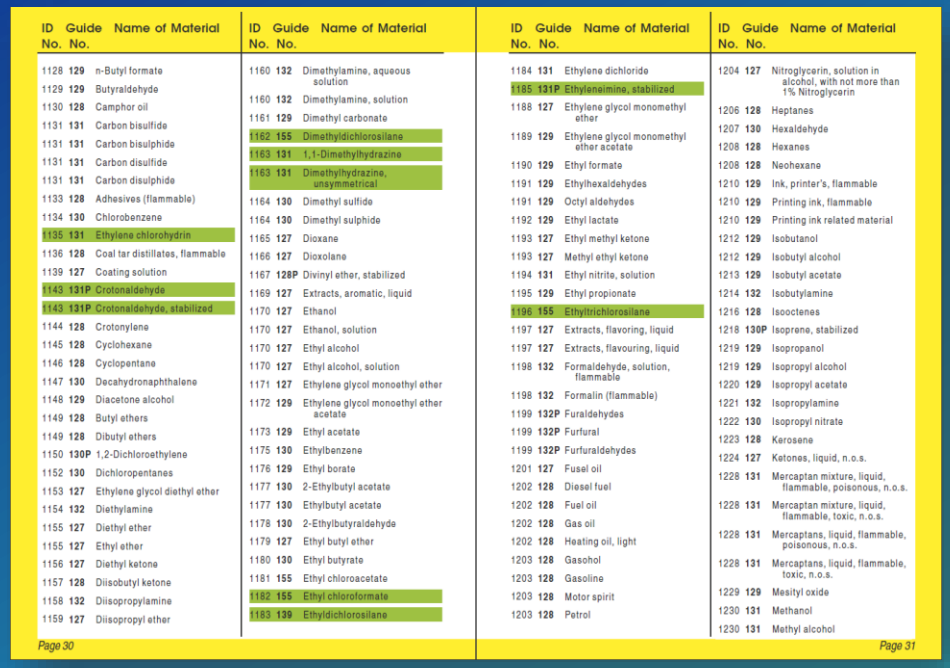
The White Section provides:

- Instructions on how to use the guidebook
- Information regarding shipping documents
- Guidance for hazardous material incident response
- Information on the hazard classification system
- General safety precautions
- … and more!



Components

The Yellow Section references the material in numerical order by assigned 4-digit UN/NA number.



ID No.	Guide No.	Name of Material
1128	129	n-Butyl formate
1129	129	Butyraldehyde
1130	128	Camphor oil
1131	131	Carbon bisulfide
1131	131	Carbon bisulphide
1131	131	Carbon disulfide
1131	131	Carbon disulphide
1133	128	Adhesives (flammable)
1134	130	Chlorobenzene
1135	131	Ethylene chlorohydrin
1136	128	Coal tar distillates, flammable
1139	127	Coating solution
1143	131P	Crotonaldehyde
1143	131P	Crotonaldehyde, stabilized
1144	128	Crotonylene
1145	128	Cyclohexane
1146	128	Cyclopentane
1147	130	Decahydronaphthalene
1148	129	Diacetone alcohol
1149	128	Butyl ethers
1149	128	Dibutyl ethers
1150	130P	1,2-Dichloroethylene
1152	130	Dichloropentanes
1153	127	Ethylene glycol diethyl ether
1154	132	Diethylamine
1155	127	Diethyl ether
1155	127	Ethyl ether
1156	127	Diethyl ketone
1157	128	Diisobutyl ketone
1158	132	Diisopropylamine
1159	127	Diisopropyl ether
1160	132	Dimethylamine, aqueous solution
1160	132	Dimethylamine, solution
1161	129	Dimethyl carbonate
1162	155	Dimethyldichlorosilane
1163	131	1,1-Dimethylhydrazine
1163	131	Dimethylhydrazine, unsymmetrical
1164	130	Dimethyl sulfide
1164	130	Dimethyl sulphide
1165	127	Dioxane
1166	127	Dioxolane
1167	128P	Divinyl ether, stabilized
1169	127	Extracts, aromatic, liquid
1170	127	Ethanol
1170	127	Ethanol, solution
1170	127	Ethyl alcohol
1170	127	Ethyl alcohol, solution
1171	127	Ethylene glycol monoethyl ether
1172	129	Ethylene glycol monoethyl ether acetate
1173	129	Ethyl acetate
1175	130	Ethylbenzene
1176	129	Ethyl borate
1177	130	2-Ethylbutyl acetate
1177	130	Ethylbutyl acetate
1178	130	2-Ethylbutyraldehyde
1179	127	Ethyl butyl ether
1180	130	Ethyl butyrate
1181	155	Ethyl chloroacetate
1182	155	Ethyl chloroformate
1183	139	Ethyldichlorosilane

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ID No.	Guide No.	Name of Material
1184	131	Ethylene dichloride
1185	131P	Ethyleneimine, stabilized
1188	127	Ethylene glycol monomethyl ether
1189	129	Ethylene glycol monomethyl ether acetate
1190	129	Ethyl formate
1191	129	Ethylhexaldehydes
1191	129	Octyl aldehydes
1192	129	Ethyl lactate
1193	127	Ethyl methyl ketone
1193	127	Methyl ethyl ketone
1194	131	Ethyl nitrite, solution
1195	129	Ethyl propionate
1196	155	Ethyltrichlorosilane
1197	127	Extracts, flavoring, liquid
1197	127	Extracts, flavouring, liquid
1198	132	Formaldehyde, solution, flammable
1198	132	Formalin (flammable)
1199	132P	Furaldehydes
1199	132P	Furfural
1199	132P	Furfuraldehydes
1201	127	Fusel oil
1202	128	Diesel fuel
1202	128	Fuel oil
1202	128	Gas oil
1202	128	Heating oil, light
1203	128	Gasohol
1203	128	Gasoline
1203	128	Motor spirit
1203	128	Petrol
1204	127	Nitroglycerin, solution in alcohol, with not more than 1% Nitroglycerin
1206	128	Heptanes
1207	130	Hexaldehyde
1208	128	Hexanes
1208	128	Neohexane
1210	129	Ink, printer's, flammable
1210	129	Printing ink, flammable
1210	129	Printing ink related material
1212	129	Isobutanol
1212	129	Isobutyl alcohol
1213	129	Isobutyl acetate
1214	132	Isobutylamine
1216	128	Isooctenes
1218	130P	Isoprene, stabilized
1219	129	Isopropanol
1219	129	Isopropyl alcohol
1220	129	Isopropyl acetate
1221	132	Isopropylamine
1222	130	Isopropyl nitrate
1223	128	Kerosene
1224	127	Ketones, liquid, n.o.s.
1228	131	Mercaptan mixture, liquid, flammable, poisonous, n.o.s.
1228	131	Mercaptan mixture, liquid, flammable, toxic, n.o.s.
1228	131	Mercaptans, liquid, flammable, poisonous, n.o.s.
1228	131	Mercaptans, liquid, flammable, toxic, n.o.s.
1229	129	Mesityl oxide
1230	131	Methanol
1230	131	Methyl alcohol

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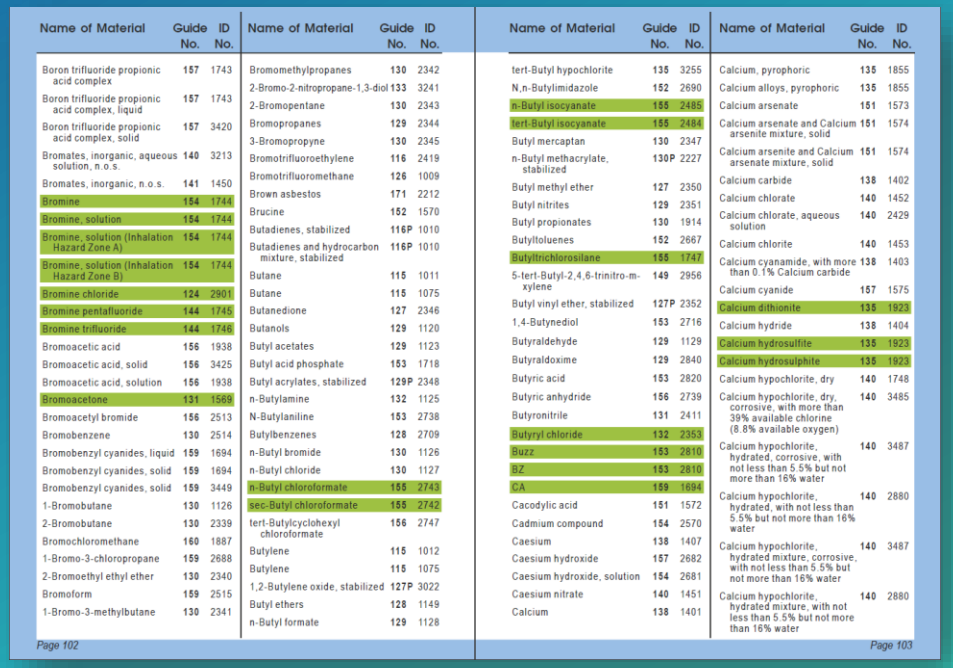
The Blue Section references the material in alphabetical order by name.



Name of Material	Guide No.	ID No.
Boron trifluoride propionic acid complex	157	1743
Boron trifluoride propionic acid complex, liquid	157	1743
Boron trifluoride propionic acid complex, solid	157	3420
Bromates, inorganic, aqueous solution, n.o.s.	140	3213
Bromates, inorganic, n.o.s.	141	1450
Bromine	154	1744
Bromine, solution	154	1744
Bromine, solution (Inhalation Hazard Zone A)	154	1744
Bromine, solution (Inhalation Hazard Zone B)	154	1744
Bromine chloride	124	2901
Bromine pentafluoride	144	1745
Bromine trifluoride	144	1746
Bromoacetic acid	156	1938
Bromoacetic acid, solid	156	3425
Bromoacetic acid, solution	156	1938
Bromoacetone	131	1569
Bromoacetyl bromide	156	2513
Bromobenzene	130	2514
Bromobenzyl cyanides, liquid	159	1694
Bromobenzyl cyanides, solid	159	1694
Bromobenzyl cyanides, solid	159	3449
1-Bromobutane	130	1126
2-Bromobutane	130	2339
Bromochloromethane	160	1887
1-Bromo-3-chloropropane	159	2688
2-Bromoethyl ethyl ether	130	2340
Bromoform	159	2515
1-Bromo-3-methylbutane	130	2341
Bromomethylpropanes	130	2342
2-Bromo-2-nitropropane-1,3-diol	133	3241
2-Bromopentane	130	2343
Bromopropanes	129	2344
3-Bromopropyne	130	2345
Bromotrifluoroethylene	116	2419
Bromotrifluoromethane	126	1009
Brown asbestos	171	2212
Brucine	152	1570
Butadienes, stabilized	116P	1010
Butadienes and hydrocarbon mixture, stabilized	116P	1010
Butane	115	1011
Butane	115	1075
Butanedione	127	2346
Butanols	129	1120
Butyl acetates	129	1123
Butyl acid phosphate	153	1718
Butyl acrylates, stabilized	129P	2348
n-Butylamine	132	1125
N-Butylaniline	153	2738
Butylbenzenes	128	2709
n-Butyl bromide	130	1126
n-Butyl chloride	130	1127
n-Butyl chloroformate	155	2743
sec-Butyl chloroformate	155	2742
tert-Butylcyclohexyl chloroformate	156	2747
Butylene	115	1012
Butylene	115	1075
1,2-Butylene oxide, stabilized	127P	3022
Butyl ethers	128	1149
n-Butyl formate	129	1128

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Name of Material	Guide No.	ID No.
tert-Butyl hypochlorite	135	3255
N,n-Butylimidazole	152	2690
n-Butyl isocyanate	155	2485
tert-Butyl isocyanate	155	2484
Butyl mercaptan	130	2347
n-Butyl methacrylate, stabilized	130P	2227
Butyl methyl ether	127	2350
Butyl nitrites	129	2351
Butyl propionates	130	1914
Butyltoluenes	152	2667
Butyltrichlorosilane	155	1747
5-tert-Butyl-2,4,6-trinitro-m-xylene	149	2956
Butyl vinyl ether, stabilized	127P	2352
1,4-Butynediol	153	2716
Butyraldehyde	129	1129
Butyraldoxime	129	2840
Butyric acid	153	2820
Butyric anhydride	156	2739
Butyronitrile	131	2411
Butyryl chloride	132	2353
Buzz	153	2810
BZ	153	2810
CA	159	1694
Cacodylic acid	151	1572
Cadmium compound	154	2570
Caesium	138	1407
Caesium hydroxide	157	2682
Caesium hydroxide, solution	154	2681
Caesium nitrate	140	1451
Calcium	138	1401
Calcium, pyrophoric	135	1855
Calcium alloys, pyrophoric	135	1855
Calcium arsenate	151	1573
Calcium arsenate and Calcium arsenite mixture, solid	151	1574
Calcium arsenite and Calcium arsenate mixture, solid	151	1574
Calcium carbide	138	1402
Calcium chlorate	140	1452
Calcium chlorate, aqueous solution	140	2429
Calcium chlorite	140	1453
Calcium cyanamide, with more than 0.1% Calcium carbide	138	1403
Calcium cyanide	157	1575
Calcium dithionite	135	1923
Calcium hydride	138	1404
Calcium hydrosulfite	135	1923
Calcium hydrosulphite	135	1923
Calcium hypochlorite, dry	140	1748
Calcium hypochlorite, dry, corrosive, with more than 39% available chlorine (8.8% available oxygen)	140	3485
Calcium hypochlorite, hydrated, corrosive, with not less than 5.5% but not more than 16% water	140	3487
Calcium hypochlorite, hydrated, with not less than 5.5% but not more than 16% water	140	2880
Calcium hypochlorite, hydrated mixture, corrosive, with not less than 5.5% but not more than 16% water	140	3487
Calcium hypochlorite, hydrated mixture, with not less than 5.5% but not more than 16% water	140	2880

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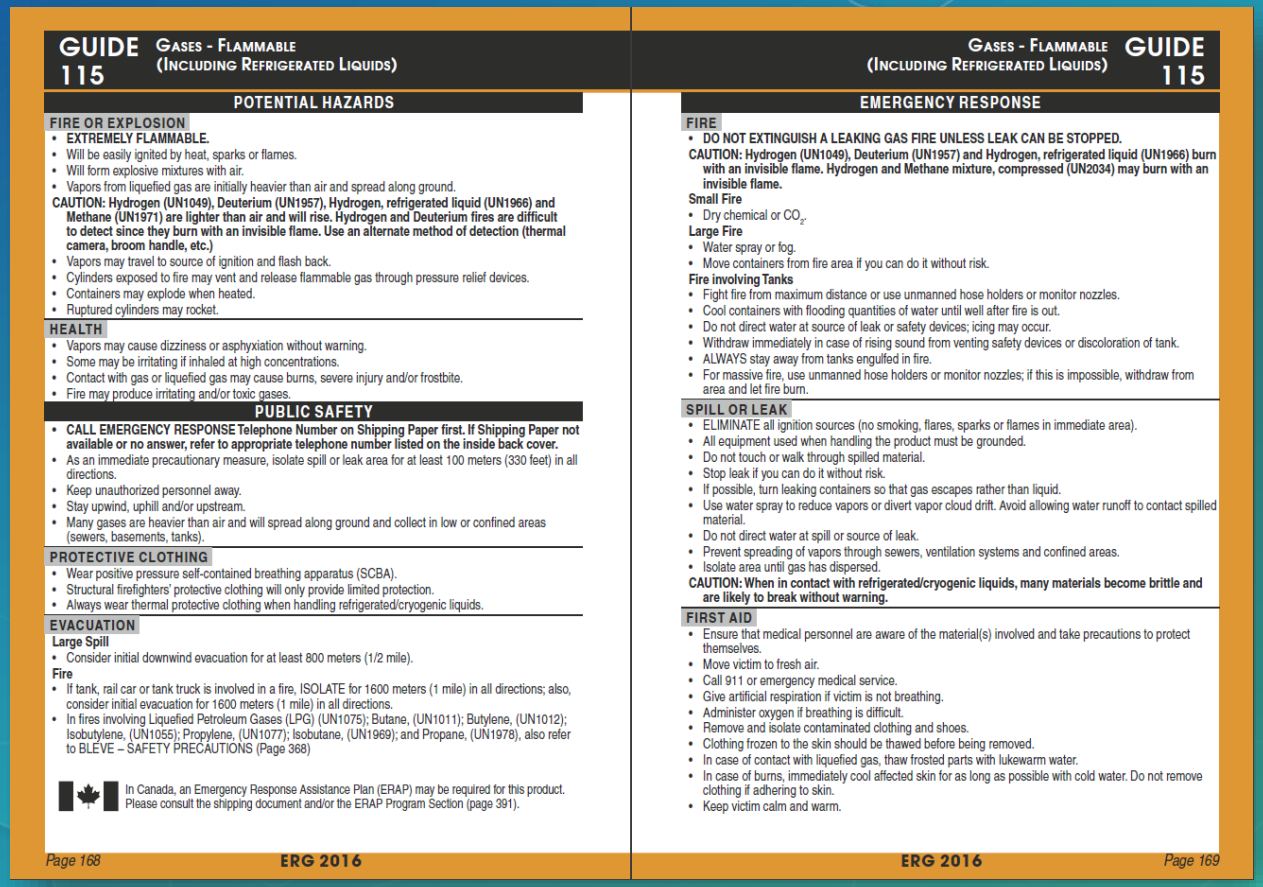
Components

The Orange Section provides safety recommendations and directions during the initial response phase. It includes:

- Potential Hazards
  - Health
  - Fire or Explosion
- Public Safety
  - Protective Clothing
  - Evacuation
- Emergency Response
  - Fire
  - Spill or Leak
  - First Aid



GUIDE 115 GASES - FLAMMABLE (INCLUDING REFRIGERATED LIQUIDS)

POTENTIAL HAZARDS

FIRE OR EXPLOSION
- **EXTREMELY FLAMMABLE.**
- Will be easily ignited by heat, sparks or flames.
- Will form explosive mixtures with air.
- Vapors from liquefied gas are initially heavier than air and spread along ground.

CAUTION: Hydrogen (UN1049), Deuterium (UN1957), Hydrogen, refrigerated liquid (UN1966) and Methane (UN1971) are lighter than air and will rise. Hydrogen and Deuterium fires are difficult to detect since they burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)
- Vapors may travel to source of ignition and flash back.
- Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

HEALTH
- Vapors may cause dizziness or asphyxiation without warning.
- Some may be irritating if inhaled at high concentrations.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Fire may produce irritating and/or toxic gases.

PUBLIC SAFETY
- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).

PROTECTIVE CLOTHING
- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.
- Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

EVACUATION

Large Spill
- Consider initial downwind evacuation for at least 800 meters (1/2 mile).

Fire
- If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.
- In fires involving Liquefied Petroleum Gases (LPG) (UN1075); Butane, (UN1011); Butylene, (UN1012); Isobutylene, (UN1055); Propylene, (UN1077); Isobutane, (UN1969); and Propane, (UN1978), also refer to BLEVE – SAFETY PRECAUTIONS (Page 368)

In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

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GASES - FLAMMABLE (INCLUDING REFRIGERATED LIQUIDS) GUIDE 115

EMERGENCY RESPONSE

FIRE
- **DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.**

CAUTION: Hydrogen (UN1049), Deuterium (UN1957) and Hydrogen, refrigerated liquid (UN1966) burn with an invisible flame. Hydrogen and Methane mixture, compressed (UN2034) may burn with an invisible flame.

Small Fire
- Dry chemical or CO_2.

Large Fire
- Water spray or fog.
- Move containers from fire area if you can do it without risk.

Fire involving Tanks
- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Do not direct water at spill or source of leak.
- Prevent spreading of vapors through sewers, ventilation systems and confined areas.
- Isolate area until gas has dispersed.

CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.

FIRST AID
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Clothing frozen to the skin should be thawed before being removed.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.

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Components

The Green Section provides initial evacuation or protective action distances, and specific guidance for:

- Materials that are Toxic-by-Inhalation (TIH)
- Toxic gases that are produced on contact with water
- Six materials commonly transported in bulk

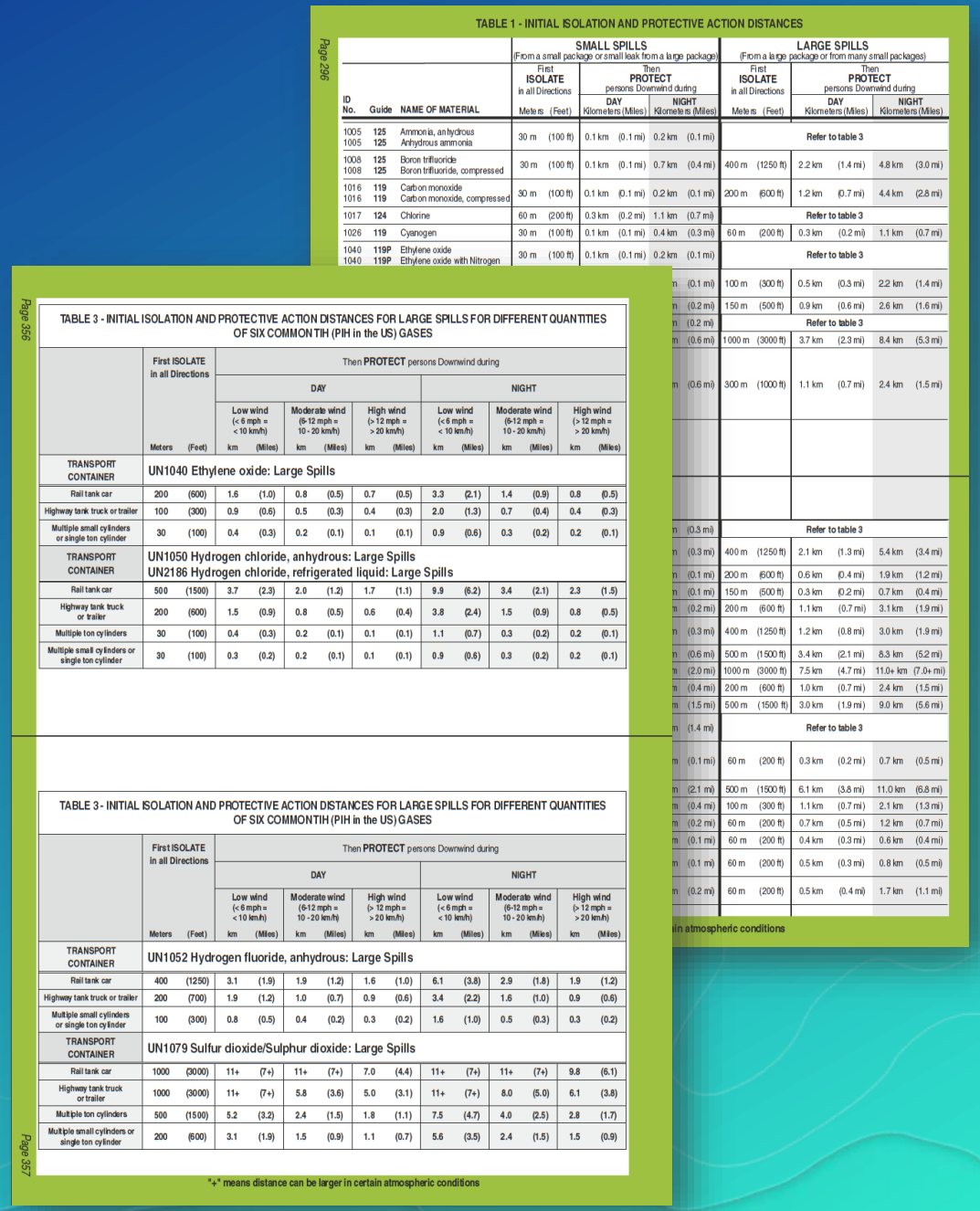

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TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

ID No.	Guide	NAME OF MATERIAL	SMALL SPILLS (From a small package or small leak from a large package) First ISOLATE in all Directions Meters (Feet)	Then PROTECT persons Downwind during DAY Kilometers (Miles)	Then PROTECT persons Downwind during NIGHT Kilometers (Miles)	LARGE SPILLS (From a large package or from many small packages) First ISOLATE in all Directions Meters (Feet)	Then PROTECT persons Downwind during DAY Kilometers (Miles)	Then PROTECT persons Downwind during NIGHT Kilometers (Miles)
1005	125	Ammonia, anhydrous	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	Refer to table 3		
1005	125	Anhydrous ammonia						
1008	125	Boron trifluoride	30 m (100 ft)	0.1 km (0.1 mi)	0.7 km (0.4 mi)	400 m (1250 ft)	2.2 km (1.4 mi)	4.8 km (3.0 mi)
1008	125	Boron trifluoride, compressed						
1016	119	Carbon monoxide	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	200 m (600 ft)	1.2 km (0.7 mi)	4.4 km (2.8 mi)
1016	119	Carbon monoxide, compressed						
1017	124	Chlorine	60 m (200 ft)	0.3 km (0.2 mi)	1.1 km (0.7 mi)	Refer to table 3		
1026	119	Cyanogen	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.3 mi)	60 m (200 ft)	0.3 km (0.2 mi)	1.1 km (0.7 mi)
1040	119P	Ethylene oxide	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	Refer to table 3		
1040	119P	Ethylene oxide with Nitrogen						

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TABLE 3 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES FOR LARGE SPILLS FOR DIFFERENT QUANTITIES OF SIX COMMON TIH (PIH in the US) GASES

	First ISOLATE in all Directions	Then PROTECT persons Downwind during DAY Low wind (< 6 mph = < 10 km/h)	DAY Moderate wind (6-12 mph = 10 - 20 km/h)	DAY High wind (> 12 mph = > 20 km/h)	NIGHT Low wind (< 6 mph = < 10 km/h)	NIGHT Moderate wind (6-12 mph = 10 - 20 km/h)	NIGHT High wind (> 12 mph = > 20 km/h)
	Meters (Feet)	km (Miles)	km (Miles)	km (Miles)	km (Miles)	km (Miles)	km (Miles)
TRANSPORT CONTAINER	UN1040 Ethylene oxide: Large Spills						
Rail tank car	200 (600)	1.6 (1.0)	0.8 (0.5)	0.7 (0.5)	3.3 (2.1)	1.4 (0.9)	0.8 (0.5)
Highway tank truck or trailer	100 (300)	0.9 (0.6)	0.5 (0.3)	0.4 (0.3)	2.0 (1.3)	0.7 (0.4)	0.4 (0.3)
Multiple small cylinders or single ton cylinder	30 (100)	0.4 (0.3)	0.2 (0.1)	0.1 (0.1)	0.9 (0.6)	0.3 (0.2)	0.2 (0.1)
TRANSPORT CONTAINER	UN1050 Hydrogen chloride, anhydrous: Large Spills UN2186 Hydrogen chloride, refrigerated liquid: Large Spills						
Rail tank car	500 (1500)	3.7 (2.3)	2.0 (1.2)	1.7 (1.1)	9.9 (6.2)	3.4 (2.1)	2.3 (1.5)
Highway tank truck or trailer	200 (600)	1.5 (0.9)	0.8 (0.5)	0.6 (0.4)	3.8 (2.4)	1.5 (0.9)	0.8 (0.5)
Multiple ton cylinders	30 (100)	0.4 (0.3)	0.2 (0.1)	0.1 (0.1)	1.1 (0.7)	0.3 (0.2)	0.2 (0.1)
Multiple small cylinders or single ton cylinder	30 (100)	0.3 (0.2)	0.2 (0.1)	0.1 (0.1)	0.9 (0.6)	0.3 (0.2)	0.2 (0.1)

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TABLE 3 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES FOR LARGE SPILLS FOR DIFFERENT QUANTITIES OF SIX COMMON TIH (PIH in the US) GASES

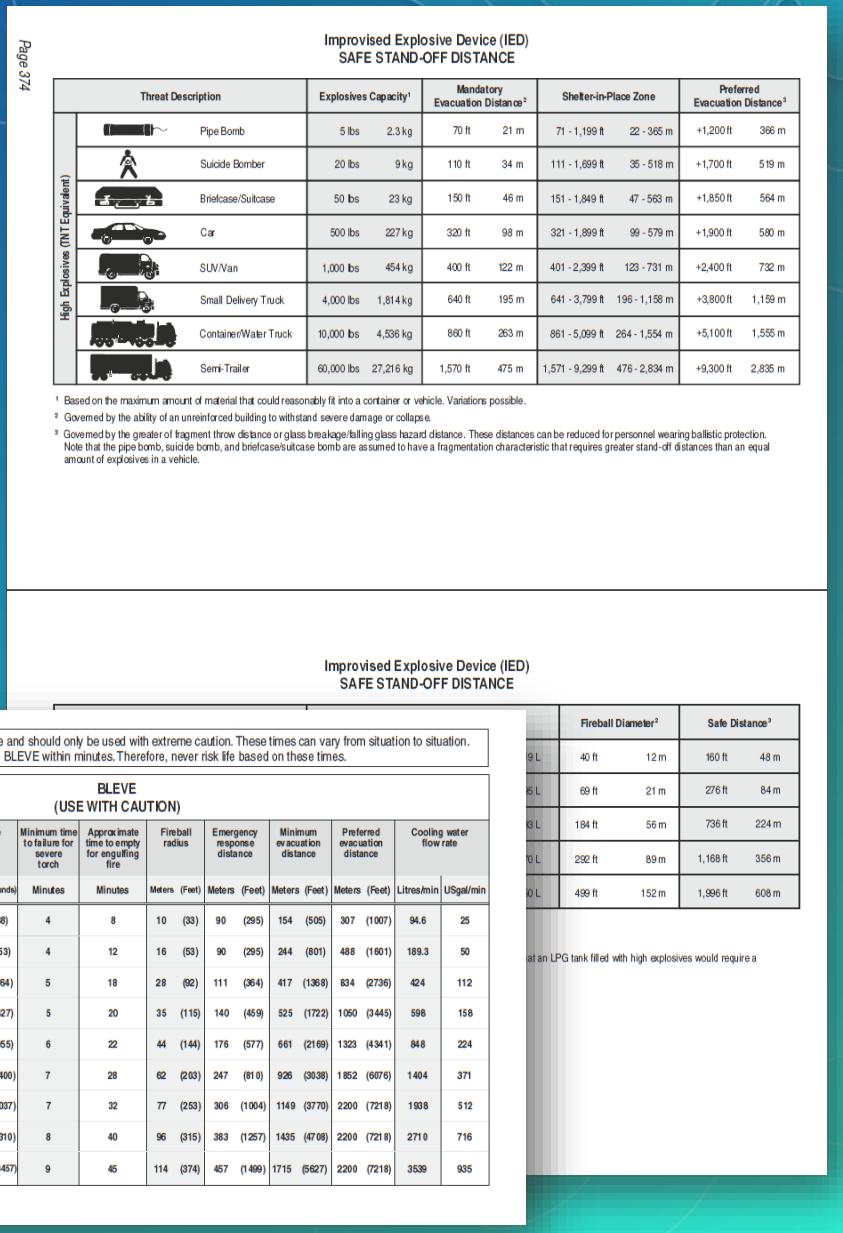
	First ISOLATE in all Directions	Then PROTECT persons Downwind during DAY Low wind (< 6 mph = < 10 km/h)	DAY Moderate wind (6-12 mph = 10 - 20 km/h)	DAY High wind (> 12 mph = > 20 km/h)	NIGHT Low wind (< 6 mph = < 10 km/h)	NIGHT Moderate wind (6-12 mph = 10 - 20 km/h)	NIGHT High wind (> 12 mph = > 20 km/h)
	Meters (Feet)	km (Miles)	km (Miles)	km (Miles)	km (Miles)	km (Miles)	km (Miles)
TRANSPORT CONTAINER	UN1052 Hydrogen fluoride, anhydrous: Large Spills						
Rail tank car	400 (1250)	3.1 (1.9)	1.9 (1.2)	1.6 (1.0)	6.1 (3.8)	2.9 (1.8)	1.9 (1.2)
Highway tank truck or trailer	200 (700)	1.9 (1.2)	1.0 (0.7)	0.9 (0.6)	3.4 (2.2)	1.6 (1.0)	0.9 (0.6)
Multiple small cylinders or single ton cylinder	100 (300)	0.8 (0.5)	0.4 (0.2)	0.3 (0.2)	1.6 (1.0)	0.5 (0.3)	0.3 (0.2)
TRANSPORT CONTAINER	UN1079 Sulfur dioxide/Sulphur dioxide: Large Spills						
Rail tank car	1000 (3000)	11+ (7+)	11+ (7+)	7.0 (4.4)	11+ (7+)	11+ (7+)	9.8 (6.1)
Highway tank truck or trailer	1000 (3000)	11+ (7+)	5.8 (3.6)	5.0 (3.1)	11+ (7+)	8.0 (5.0)	6.1 (3.8)
Multiple ton cylinders	500 (1500)	5.2 (3.2)	2.4 (1.5)	1.8 (1.1)	7.5 (4.7)	4.0 (2.5)	2.8 (1.7)
Multiple small cylinders or single ton cylinder	200 (600)	3.1 (1.9)	1.5 (0.9)	1.1 (0.7)	5.6 (3.5)	2.4 (1.5)	1.5 (0.9)

"+" means distance can be larger in certain atmospheric conditions

Components

The White Section at the back of the guide provides:

- Information regarding protective clothing and equipment
- Instructions on fire and spill control
- BLEVE (boiling liquid expanding vapor explosion) safety precautions
- Improvised Explosive Devices (IEDs) and for hazardous materials being used for terrorism
- Glossary
- Emergency Contact information
- … and more!



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Improvised Explosive Device (IED)
SAFE STAND-OFF DISTANCE

	Threat Description	Explosives Capacity[1]	Mandatory Evacuation Distance[2]	Shelter-in-Place Zone	Preferred Evacuation Distance[3]
High Explosives (TNT Equivalent)	Pipe Bomb	5 lbs 2.3 kg	70 ft 21 m	71 - 1,199 ft 22 - 365 m	+1,200 ft 366 m
	Suicide Bomber	20 lbs 9 kg	110 ft 34 m	111 - 1,699 ft 35 - 518 m	+1,700 ft 519 m
	Briefcase/Suitcase	50 lbs 23 kg	150 ft 46 m	151 - 1,849 ft 47 - 563 m	+1,850 ft 564 m
	Car	500 lbs 227 kg	320 ft 98 m	321 - 1,899 ft 99 - 579 m	+1,900 ft 580 m
	SUV/Van	1,000 lbs 454 kg	400 ft 122 m	401 - 2,399 ft 123 - 731 m	+2,400 ft 732 m
	Small Delivery Truck	4,000 lbs 1,814 kg	640 ft 195 m	641 - 3,799 ft 196 - 1,158 m	+3,800 ft 1,159 m
	Container/Water Truck	10,000 lbs 4,536 kg	860 ft 263 m	861 - 5,099 ft 264 - 1,554 m	+5,100 ft 1,555 m
	Semi-Trailer	60,000 lbs 27,216 kg	1,570 ft 475 m	1,571 - 9,299 ft 476 - 2,834 m	+9,300 ft 2,835 m

[1] Based on the maximum amount of material that could reasonably fit into a container or vehicle. Variations possible.
[2] Governed by the ability of an unreinforced building to withstand severe damage or collapse.
[3] Governed by the greater of fragment throw distance or glass breakage/falling glass hazard distance. These distances can be reduced for personnel wearing ballistic protection. Note that the pipe bomb, suicide bomb, and briefcase/suitcase bomb are assumed to have a fragmentation characteristic that requires greater stand-off distances than an equal amount of explosives in a vehicle.

Improvised Explosive Device (IED)
SAFE STAND-OFF DISTANCE

		Fireball Diameter[2]	Safe Distance[3]
	9 L	40 ft 12 m	160 ft 48 m
	5 L	69 ft 21 m	276 ft 84 m
	3 L	184 ft 56 m	736 ft 224 m
	0 L	292 ft 89 m	1,168 ft 356 m
	0 L	499 ft 152 m	1,996 ft 608 m

at an LPG tank filled with high explosives would require a

Page 369

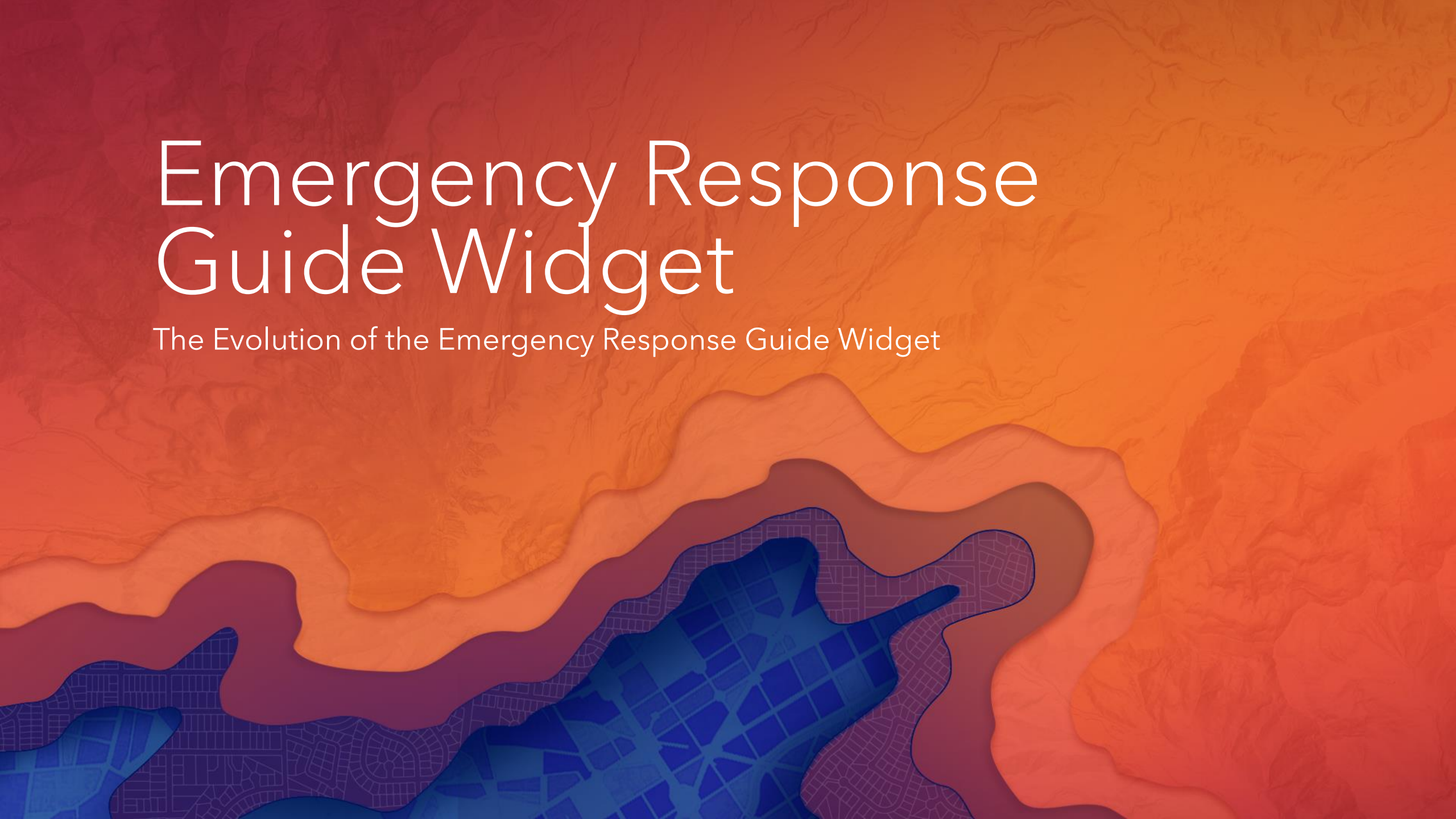
WARNING: The data given are approximate and should only be used with extreme caution. These times can vary from situation to situation. LPG tanks have been known to BLEVE within minutes. Therefore, never risk life based on these times.

BLEVE
(USE WITH CAUTION)

Capacity		Diameter		Length		Propane Mass		Minimum time to failure for severe torch	Approximate time to empty for engulfing fire	Fireball radius		Emergency response distance		Minimum evacuation distance		Preferred evacuation distance		Cooling water flow rate	
Litres	(Gallons)	Meters	(Feet)	Meters	(Feet)	Kilograms	(Pounds)	Minutes	Minutes	Meters	(Feet)	Meters	(Feet)	Meters	(Feet)	Meters	(Feet)	Litres/min	USgal/min
100	(26.4)	0.3	(1)	1.5	(4.9)	40	(88)	4	8	10	(33)	90	(295)	154	(505)	307	(1007)	94.6	25
400	(106)	0.61	(2)	1.5	(4.9)	160	(353)	4	12	16	(53)	90	(295)	244	(801)	488	(1601)	189.3	50
2000	(528)	0.96	(3.2)	3	(9.8)	800	(1764)	5	18	28	(92)	111	(364)	417	(1368)	834	(2736)	424	112
4000	(1057)	1	(3.3)	4.9	(16.1)	1600	(3527)	5	20	35	(115)	140	(459)	525	(1722)	1050	(3445)	598	158
8000	(2113)	1.25	(4.1)	6.5	(21.3)	3200	(7055)	6	22	44	(144)	176	(577)	661	(2169)	1323	(4341)	848	224
22000	(5812)	2.1	(6.9)	6.7	(22)	8800	(19400)	7	28	62	(203)	247	(810)	926	(3038)	1852	(6076)	1404	371
42000	(11095)	2.1	(6.9)	11.8	(38.7)	16800	(37037)	7	32	77	(253)	306	(1004)	1149	(3770)	2200	(7218)	1938	512
82000	(21662)	2.75	(9)	13.7	(45)	32800	(72310)	8	40	96	(315)	383	(1257)	1435	(4708)	2200	(7218)	2710	716
140000	(36984)	3.3	(10.8)	17.2	(56.4)	56000	(123457)	9	45	114	(374)	457	(1499)	1715	(5627)	2200	(7218)	3539	935

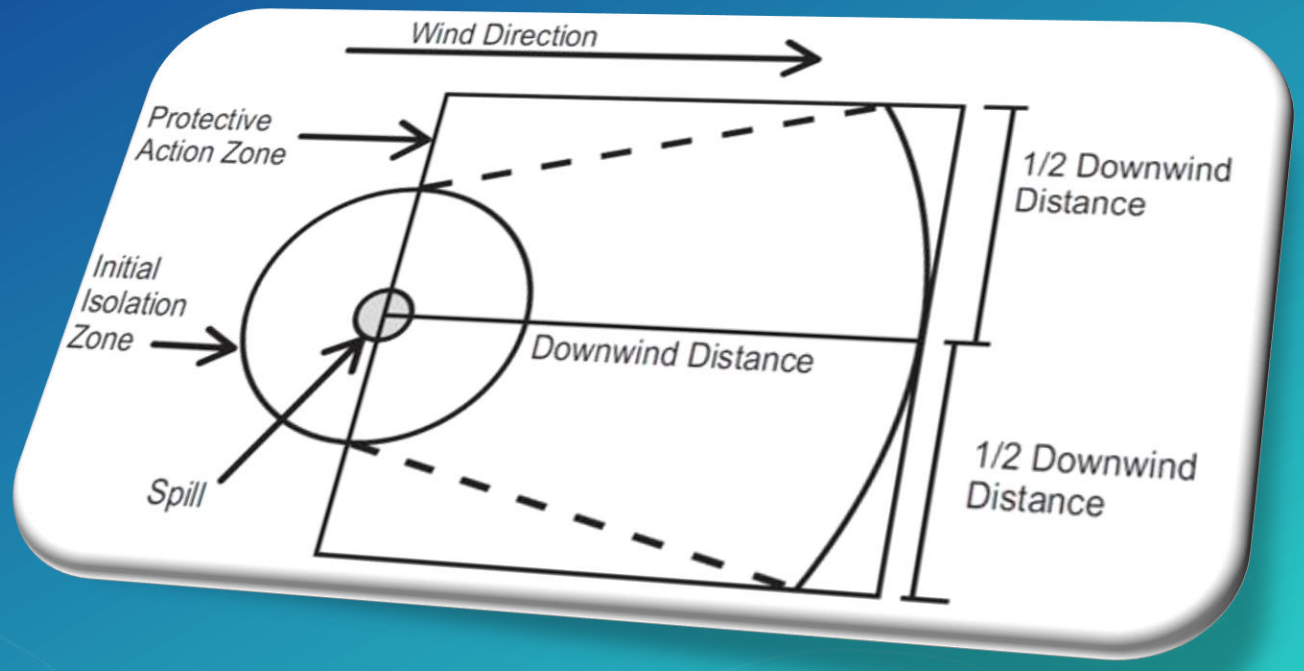
Emergency Response Guide Widget

The Evolution of the Emergency Response Guide Widget



Development

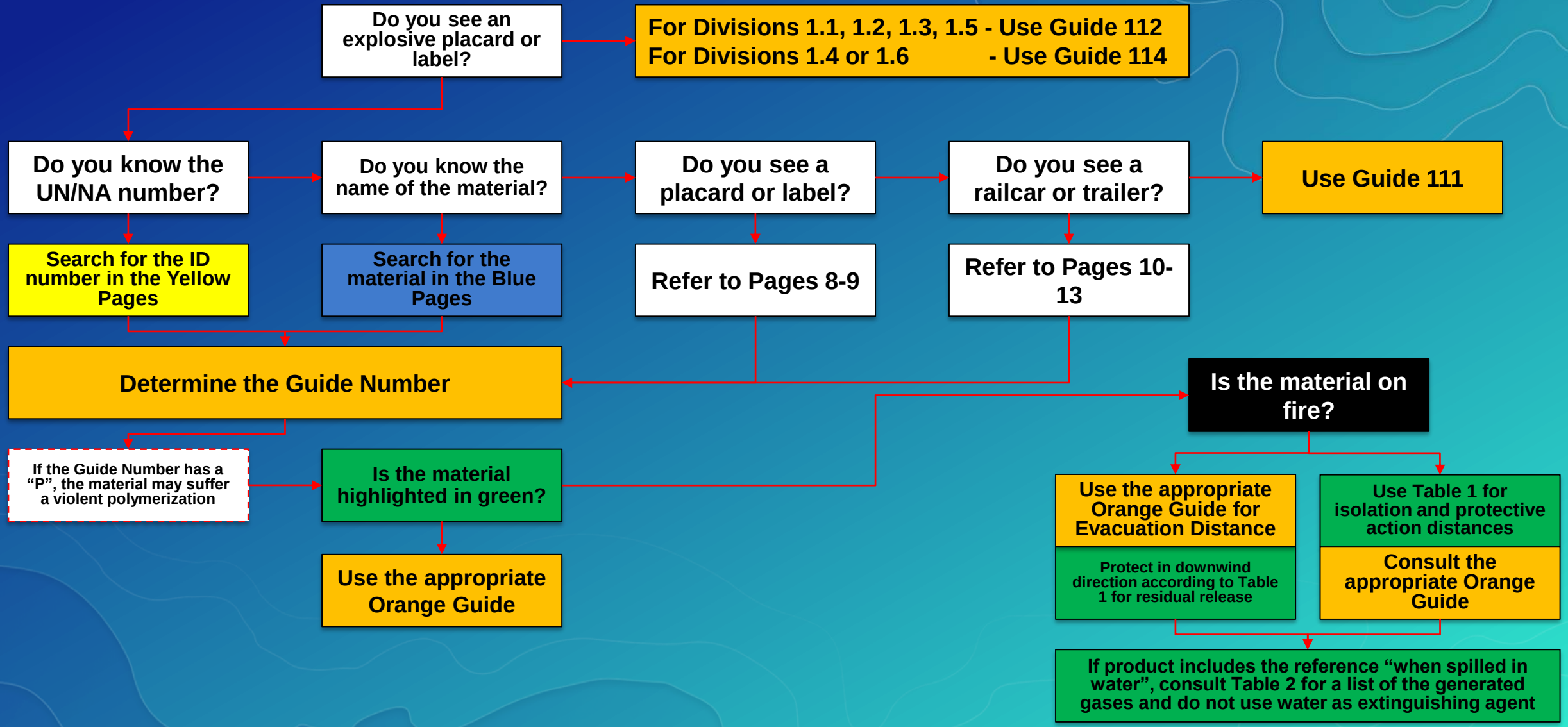
- Developed by Local Government
- First published in 2009
  - Flex Viewer widget
  - 2008 values
  - Geoprocessing tools
- Updated in 2013
  - JavaScript widget
  - Updated to 2012 values
  - Added demographic logic



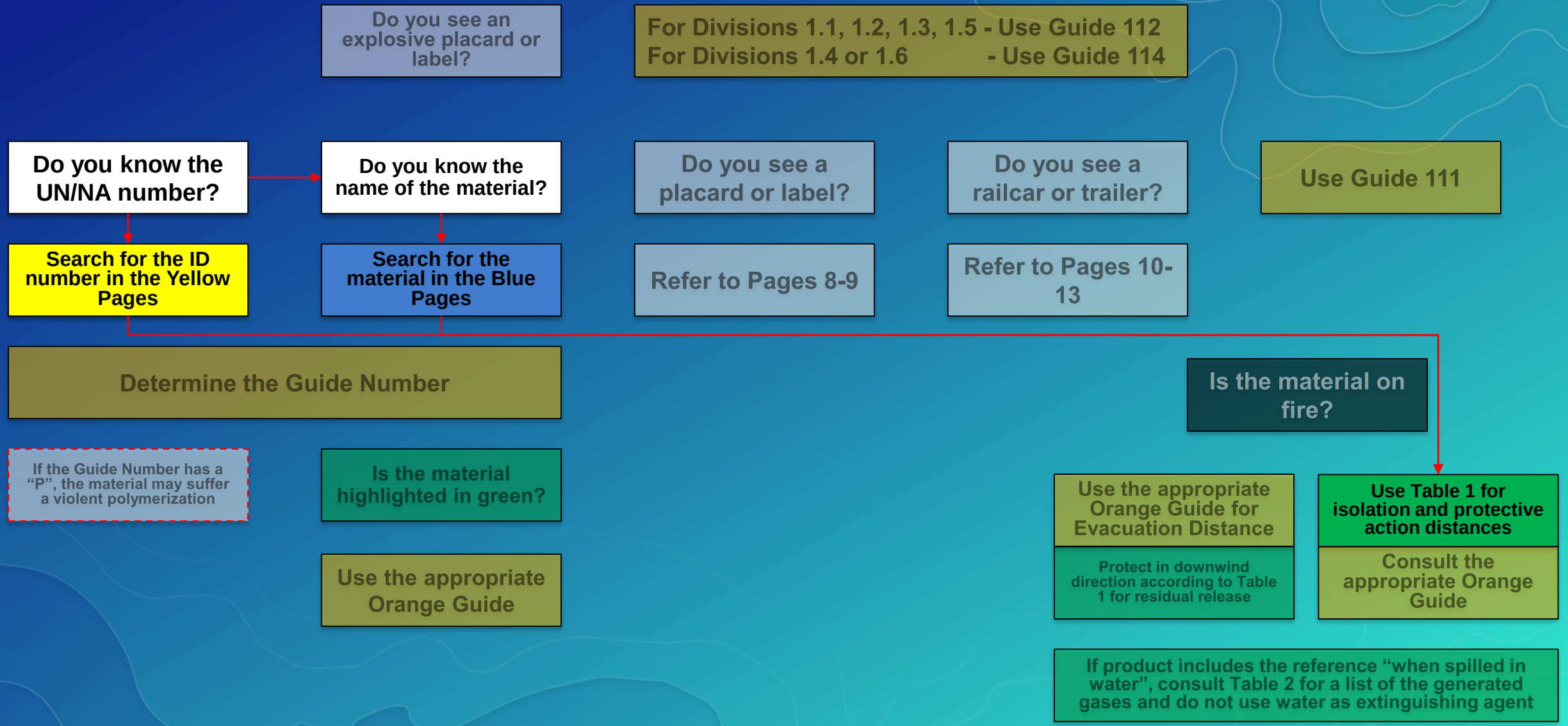
Recent Updates

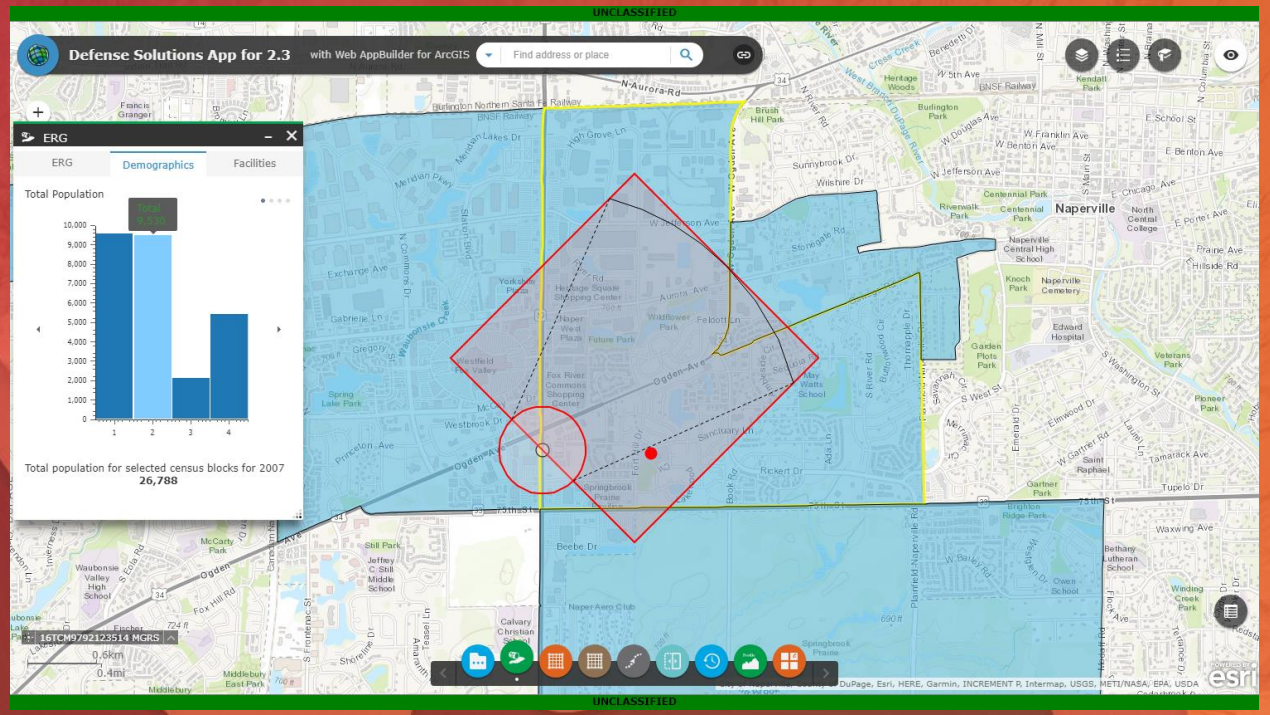
- Updated to 2016 values
  - All values, not just Table I
  - Human-readable names added
- UI adjustments
- New data tables
  - Table 3 – Toxic Inhalation Hazards (TIH)
  - Boiling Liquid Expanding Vapor Explosion (BLEVE)
  - Orange Section Distances
    - Public Safety
    - Evacuation
- No logic updates

ERG Book Workflow



ERG Widget 1.x Workflow



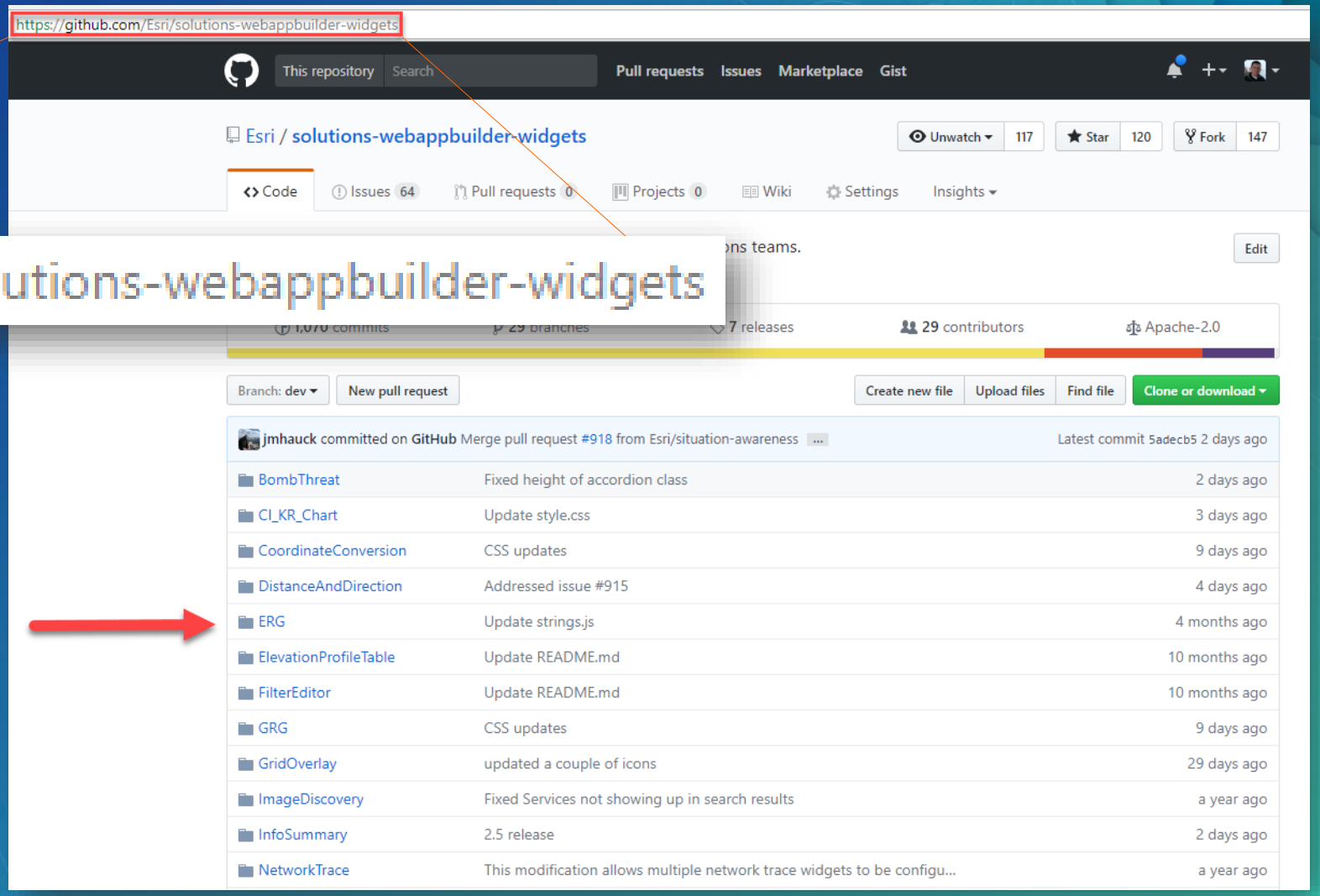


Demonstration

Using the ERG Widget

Downloading the Solution

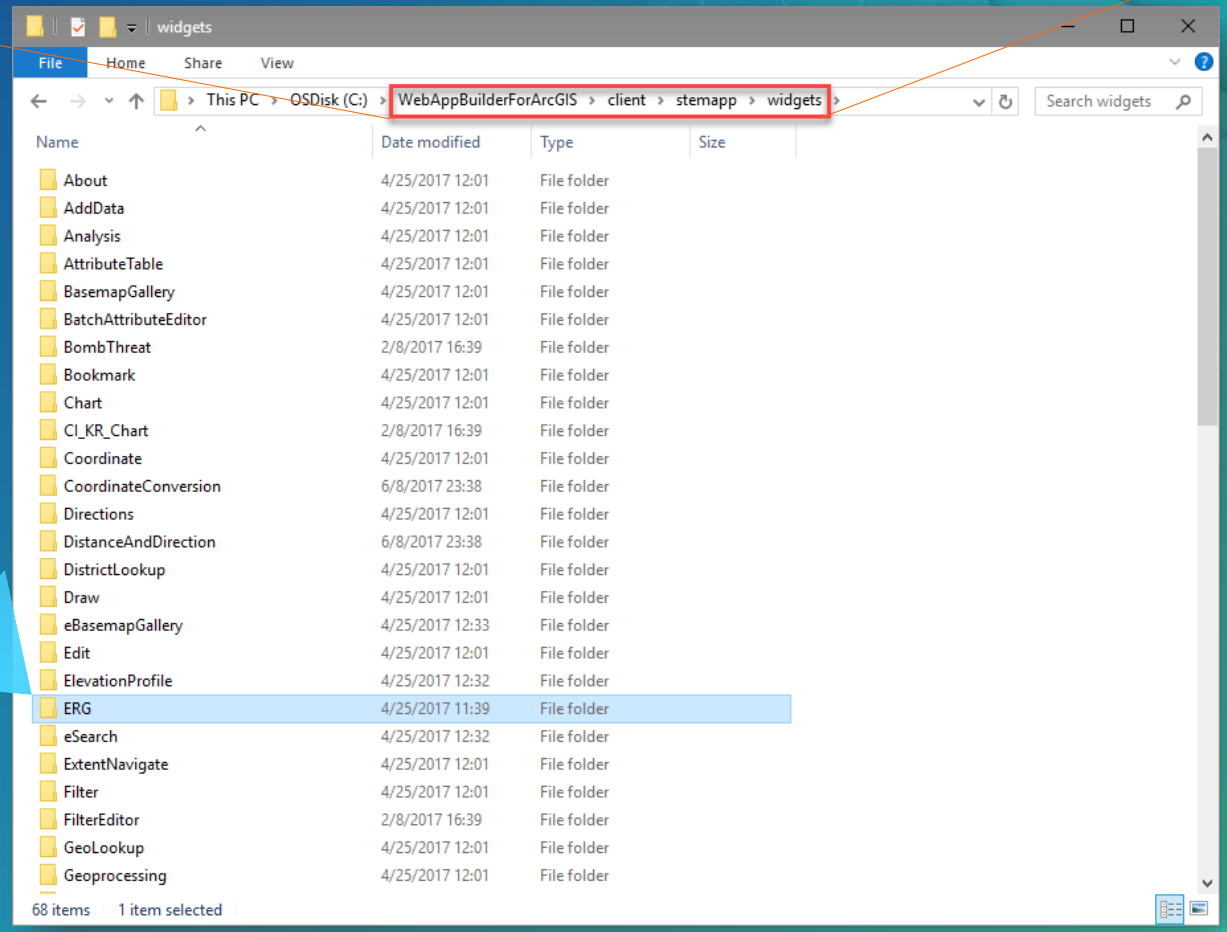
https://github.com/Esri/solutions-webappbuilder-widgets



Installing the ERG Widget

Copy widget folder from source to your instance of Web AppBuilder (Dev Edition)

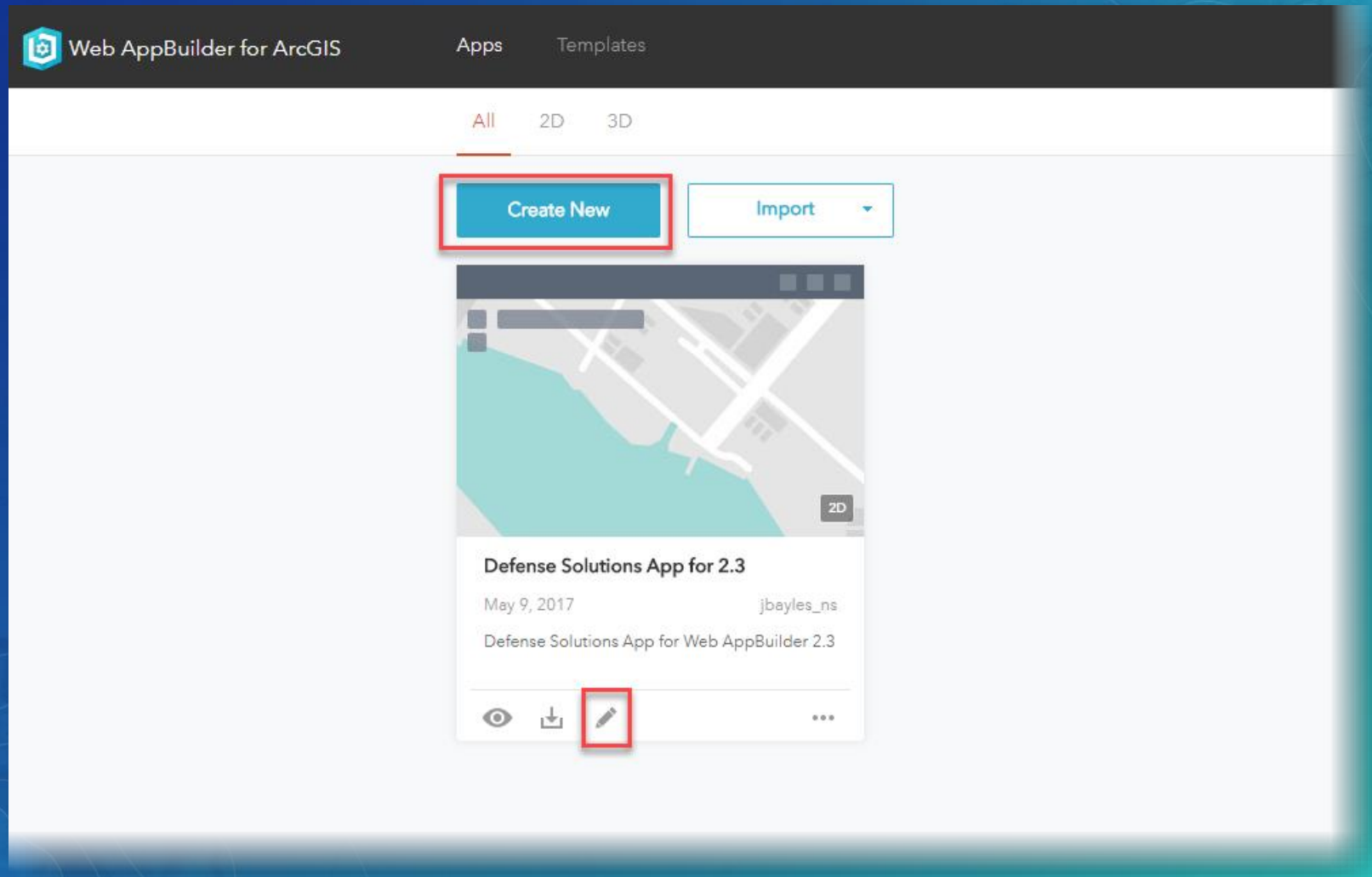
WebAppBuilderForArcGIS › client › stemapp › widgets



At ArcGIS Enterprise 10.5.1, custom widgets can be added to hosted Web AppBuilder as a Portal item type

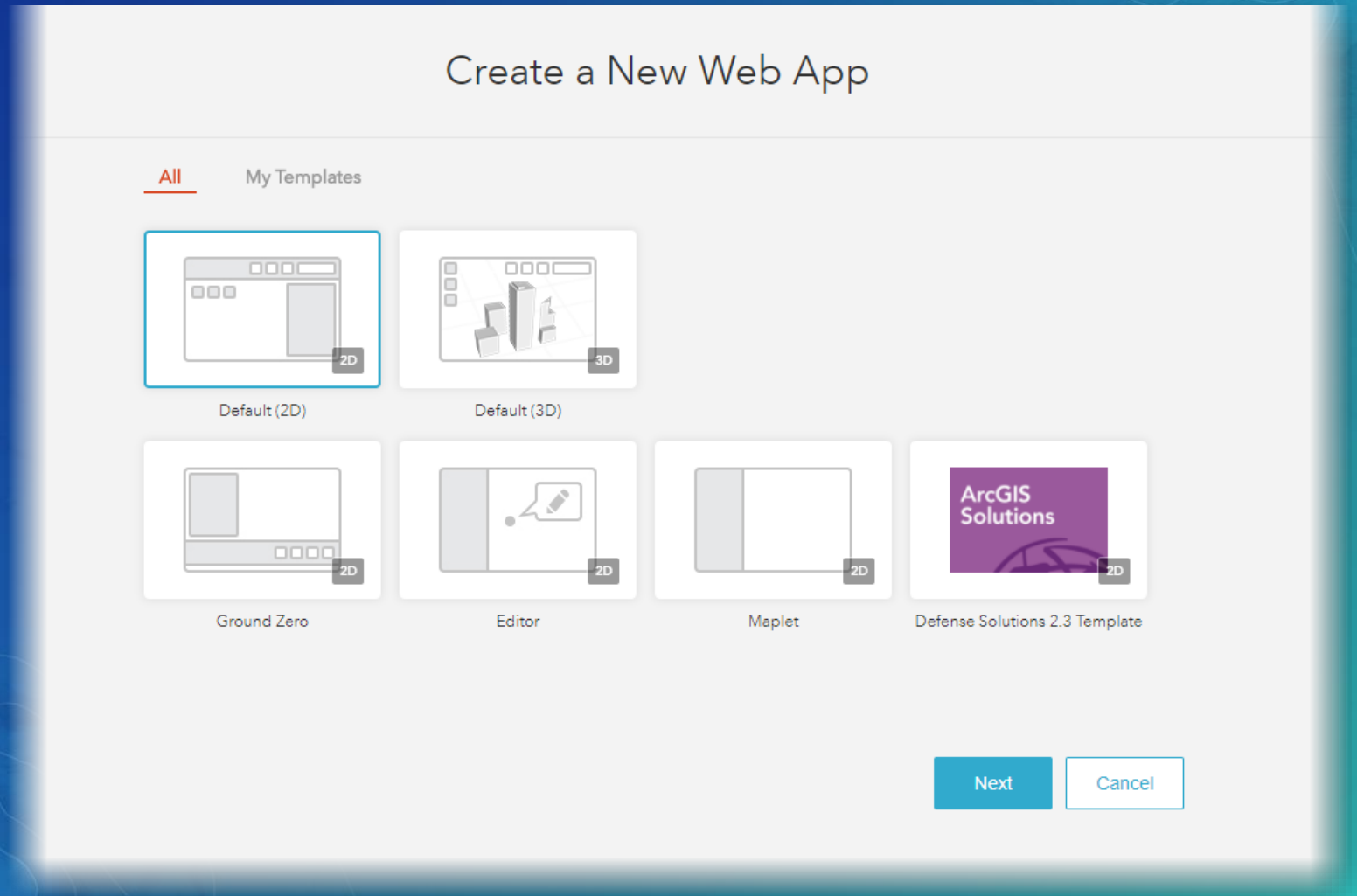
Creating a new App

Create a new app inside Web AppBuilder



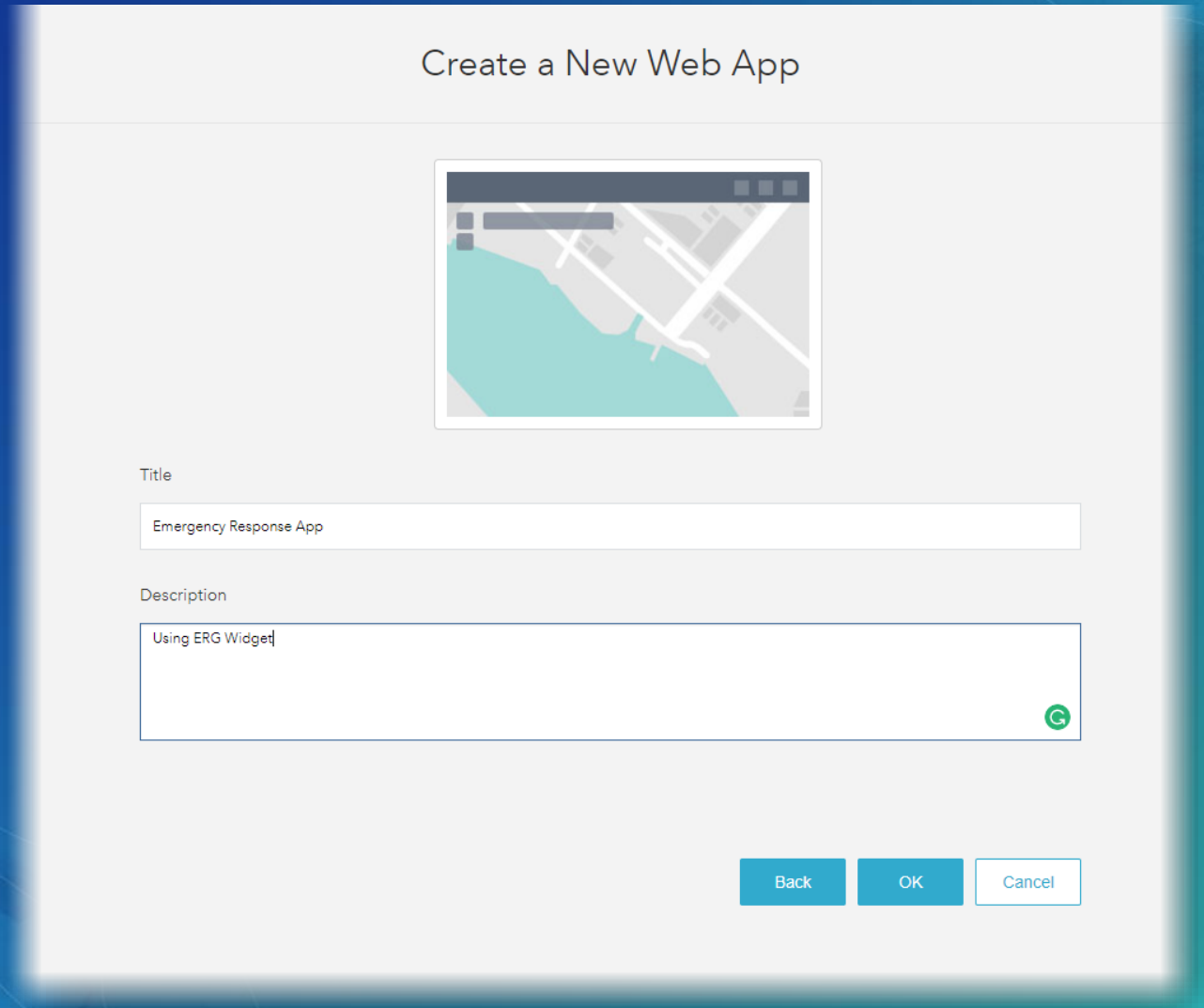
Creating a new App

Create a new app inside Web AppBuilder



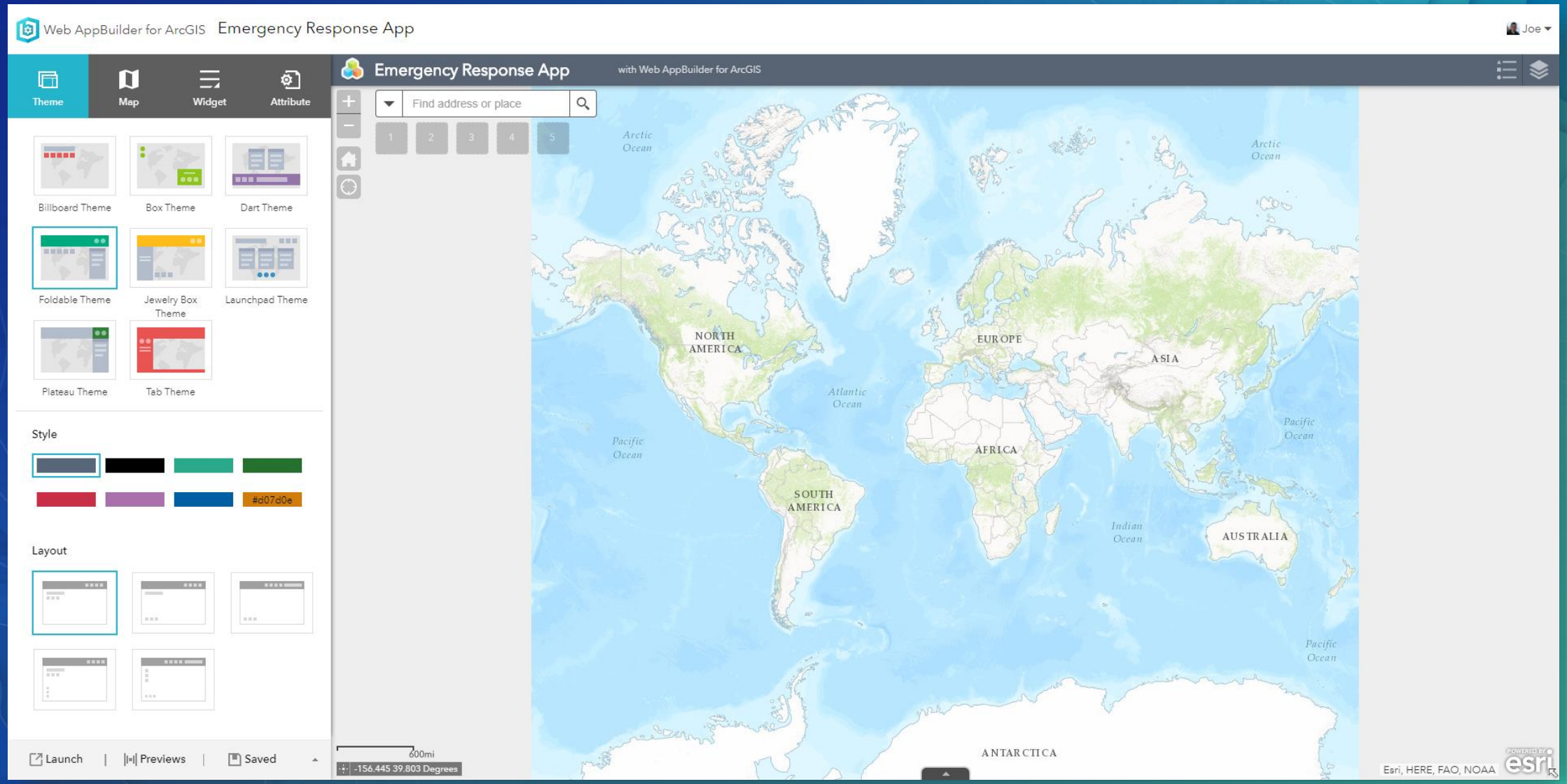
Creating a new App

Create a new app inside Web AppBuilder



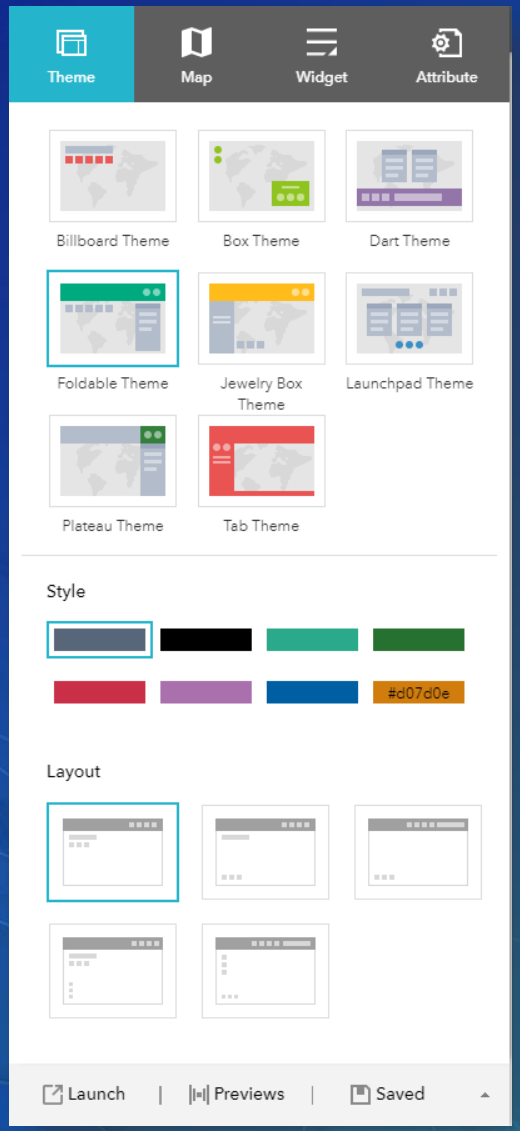
Creating a new App

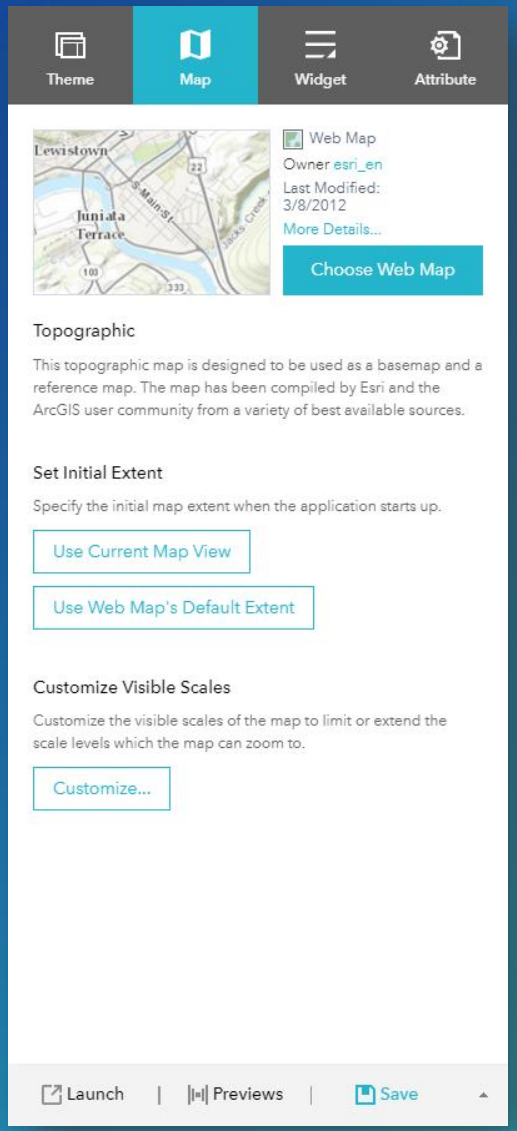
Create a new app inside Web AppBuilder

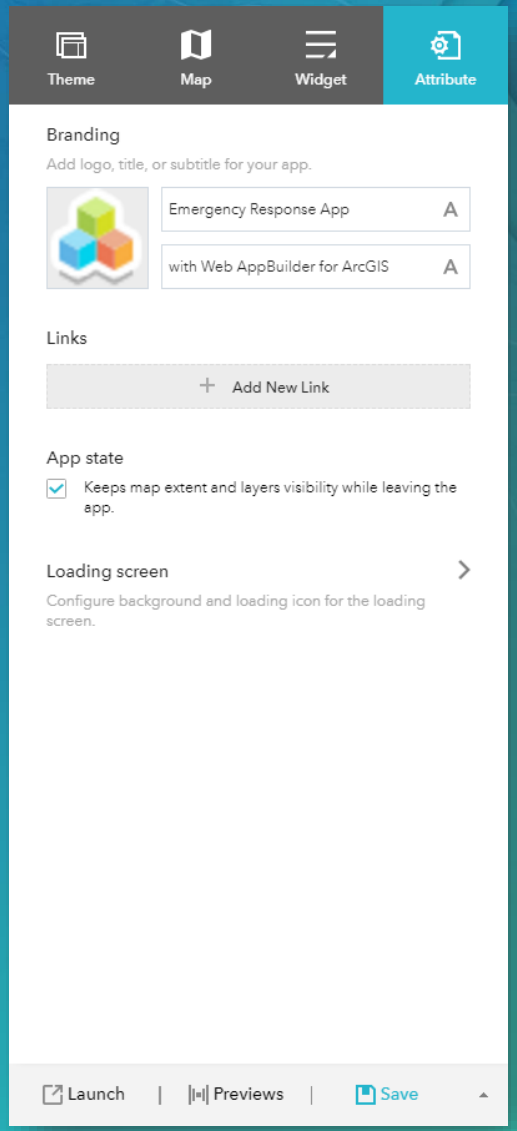


Configuring the App

Select themes, maps, and configure application attributes

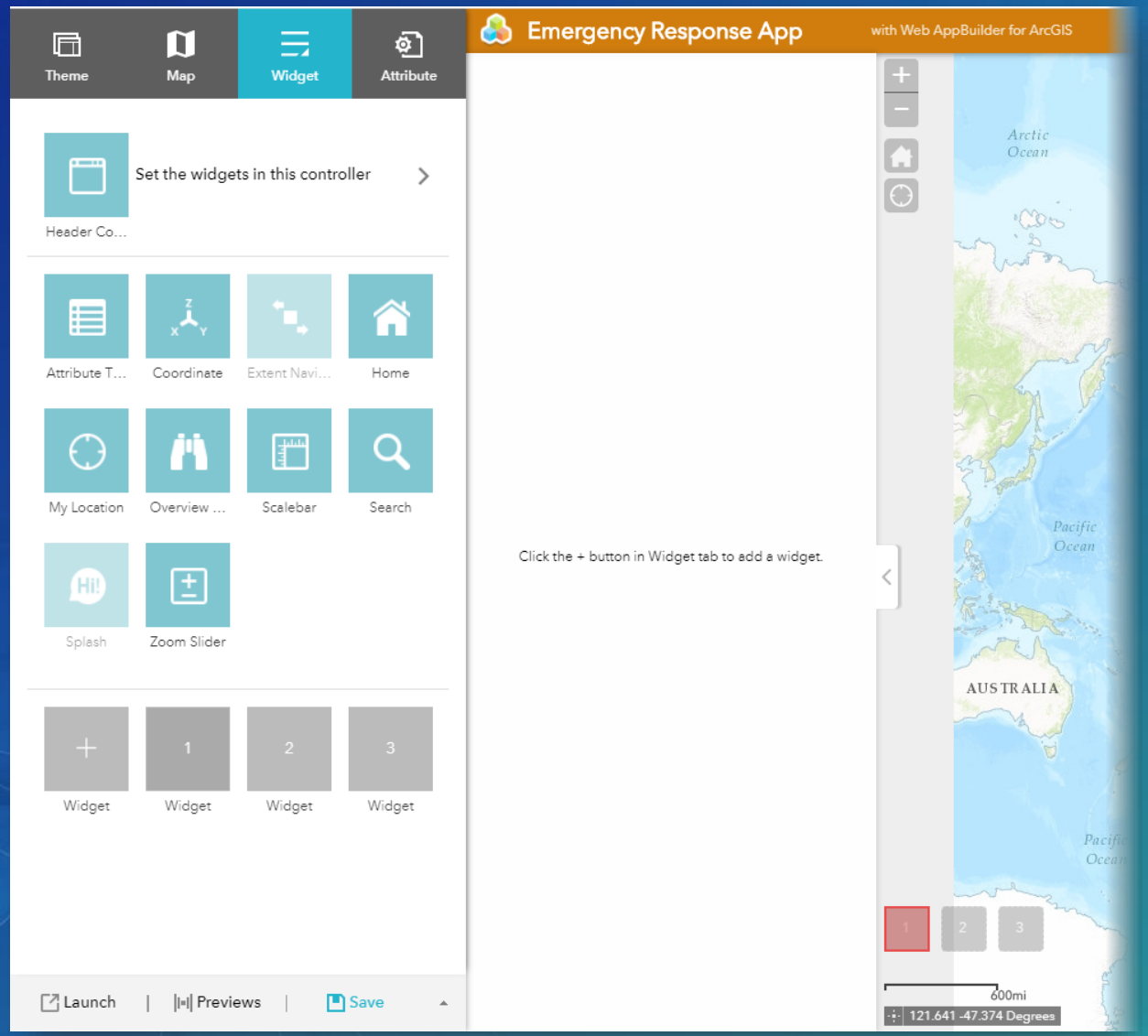






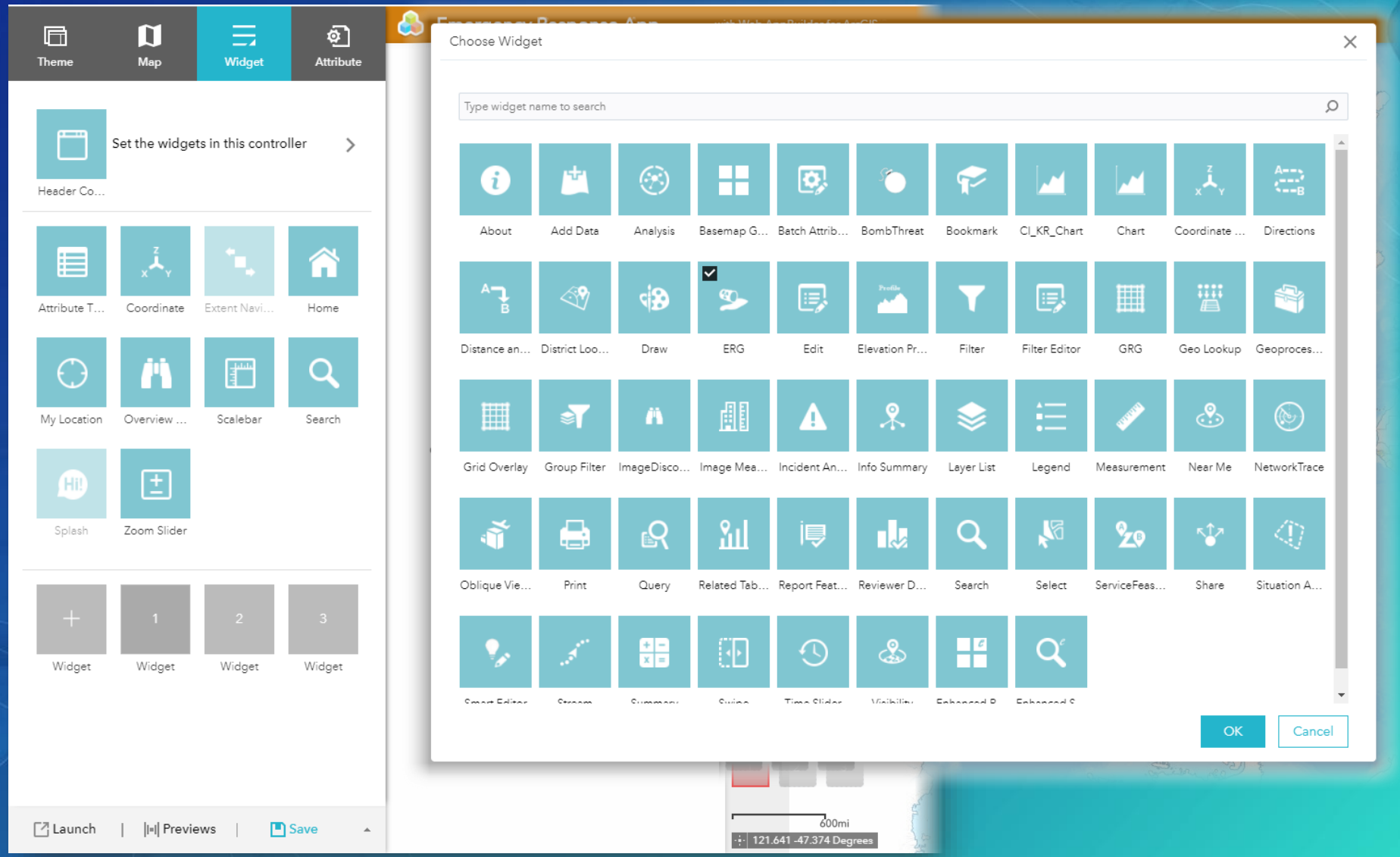
Configuring the App

Select Widgets



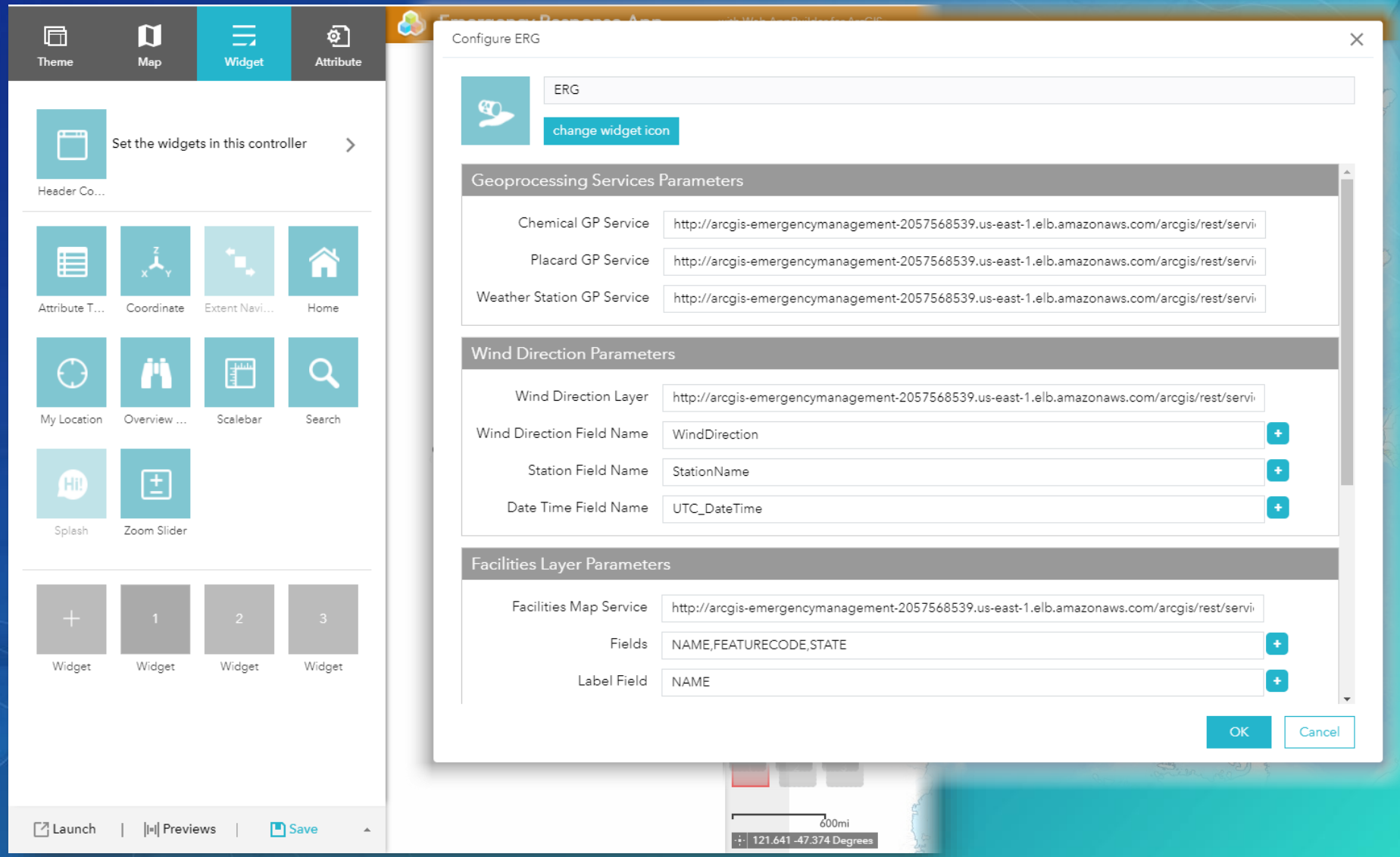
Configuring the App

Select Widgets



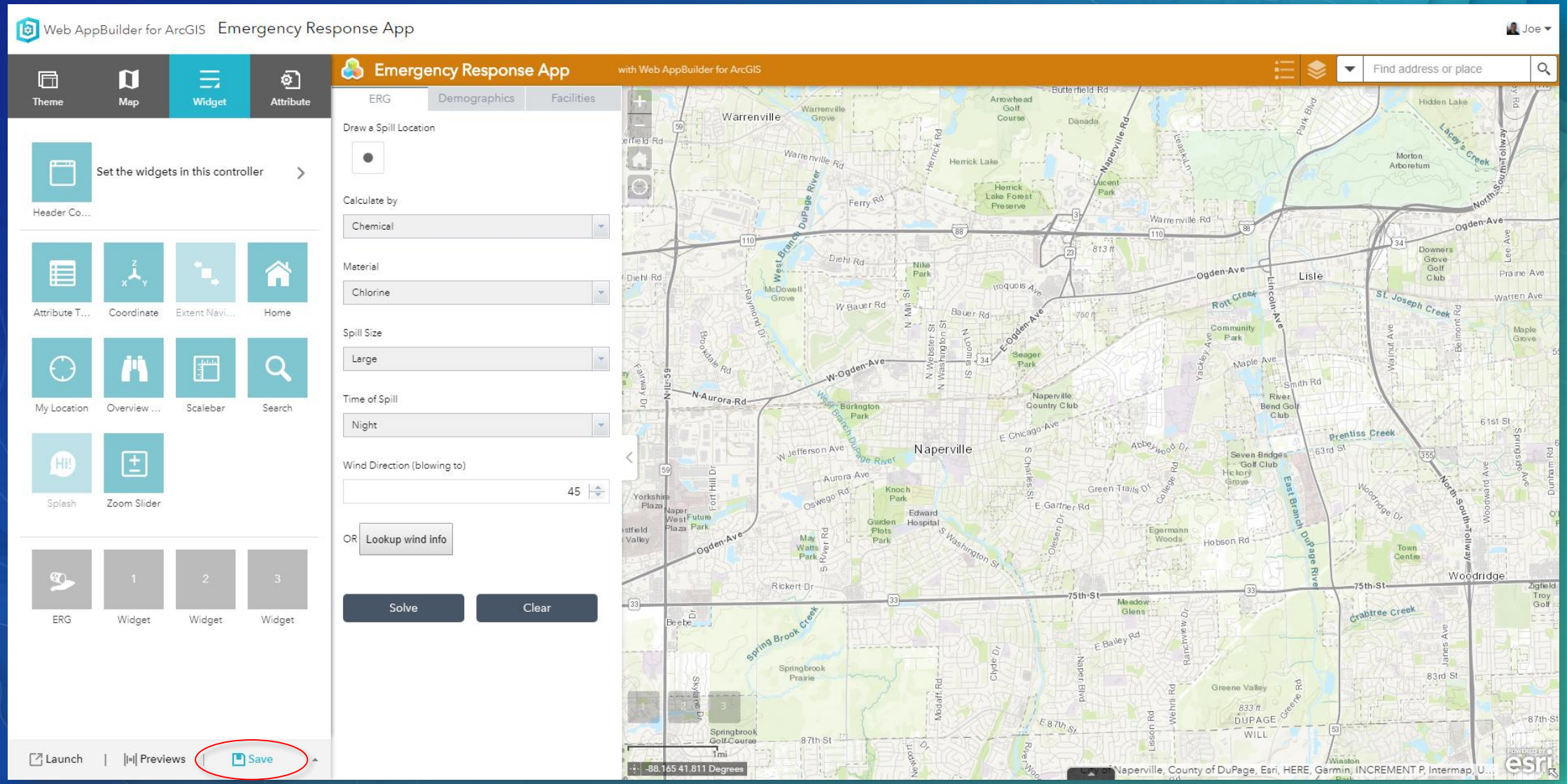
Configuring the App

Configure the ERG Widget



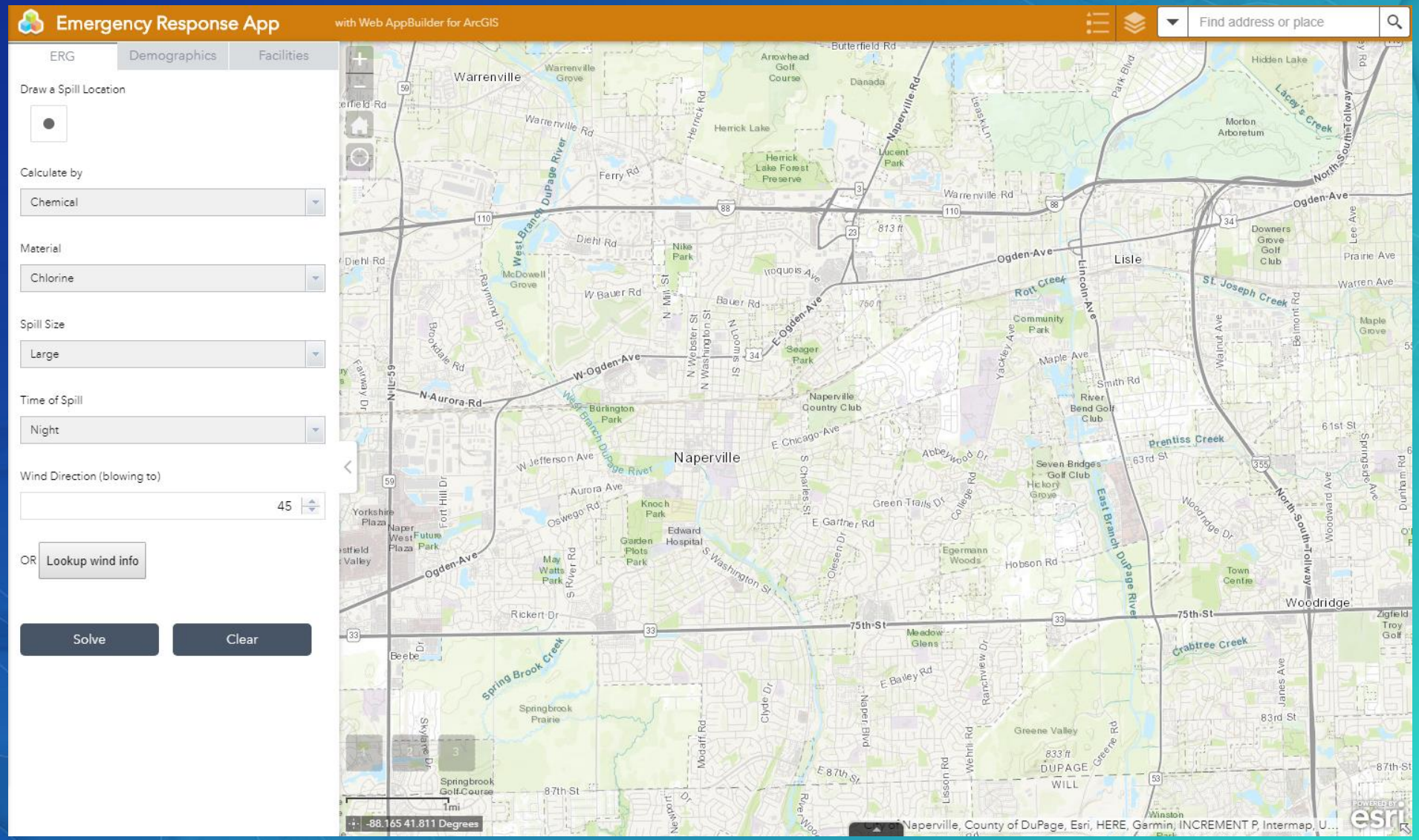
Configuring the App

Configure the ERG Widget



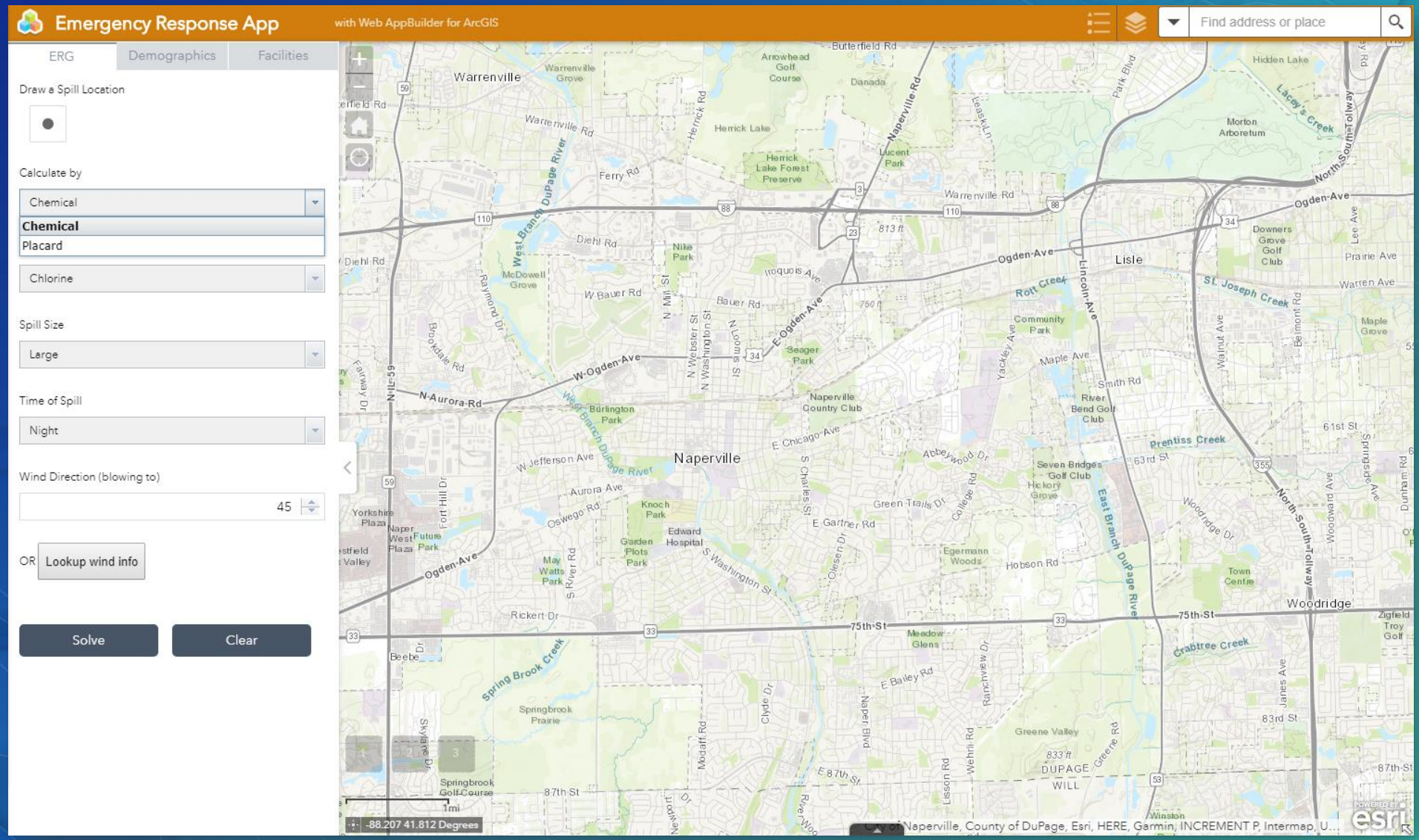
Using the App

Open the ERG Widget



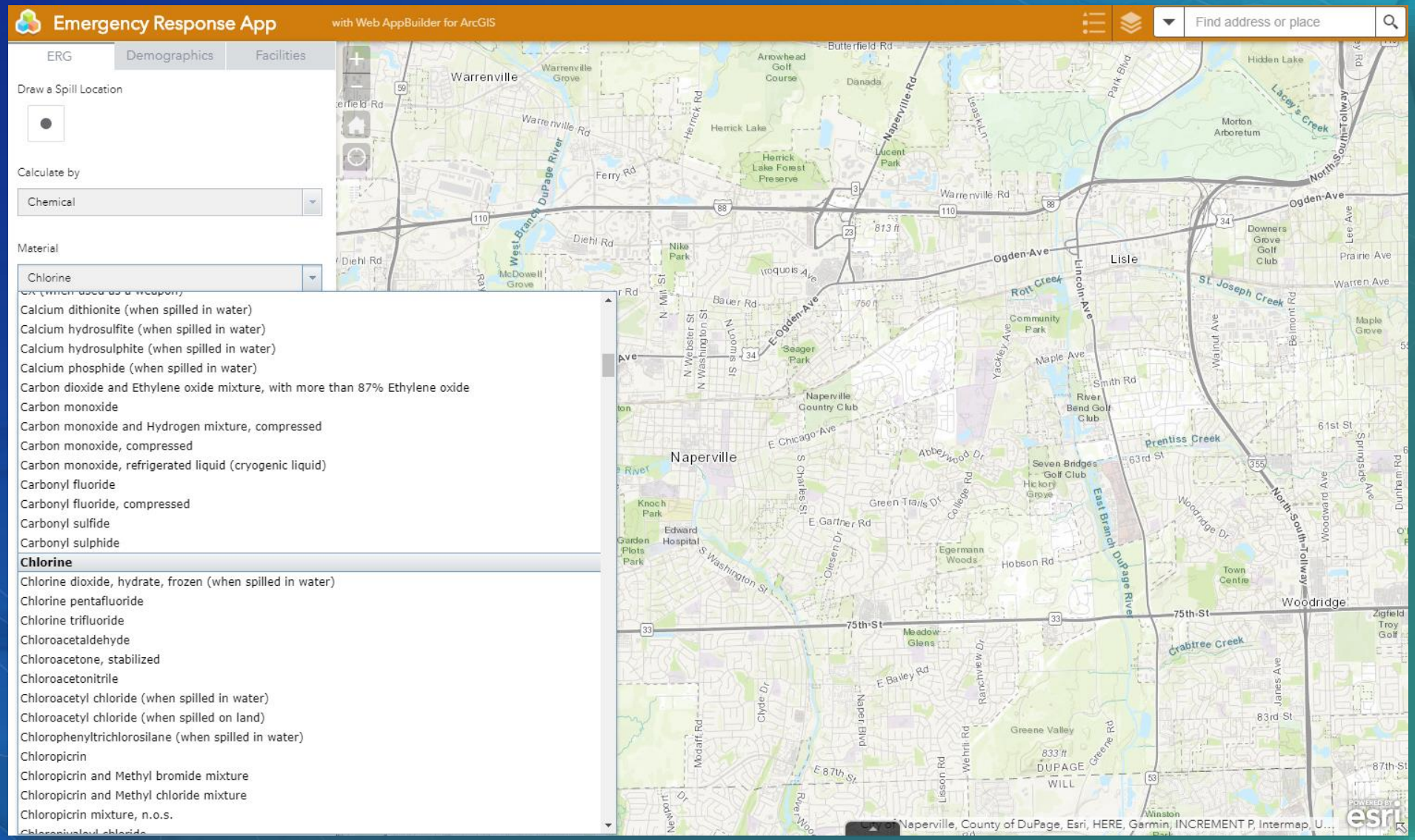
Using the App

Identify a search group



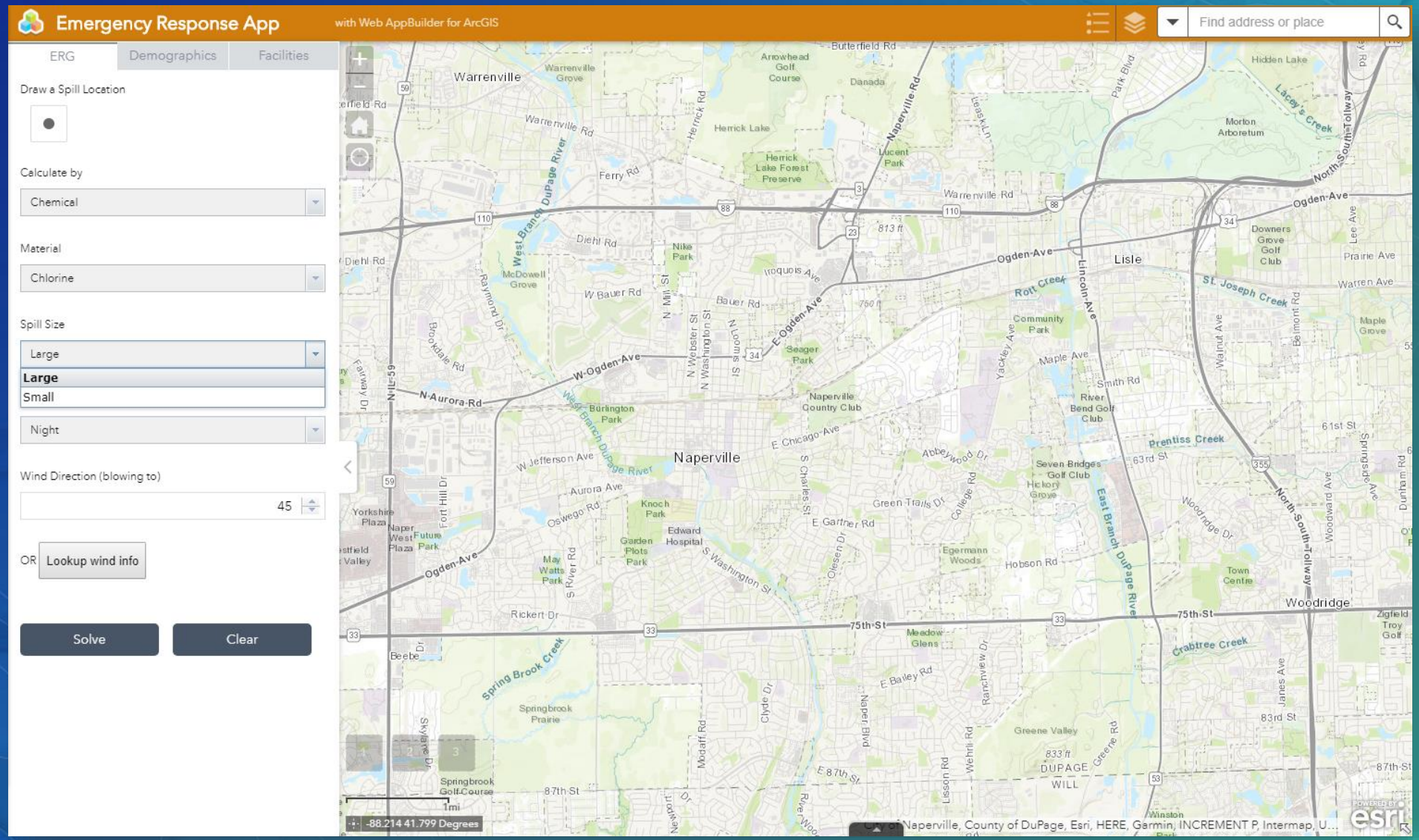
Using the App

Choose a material



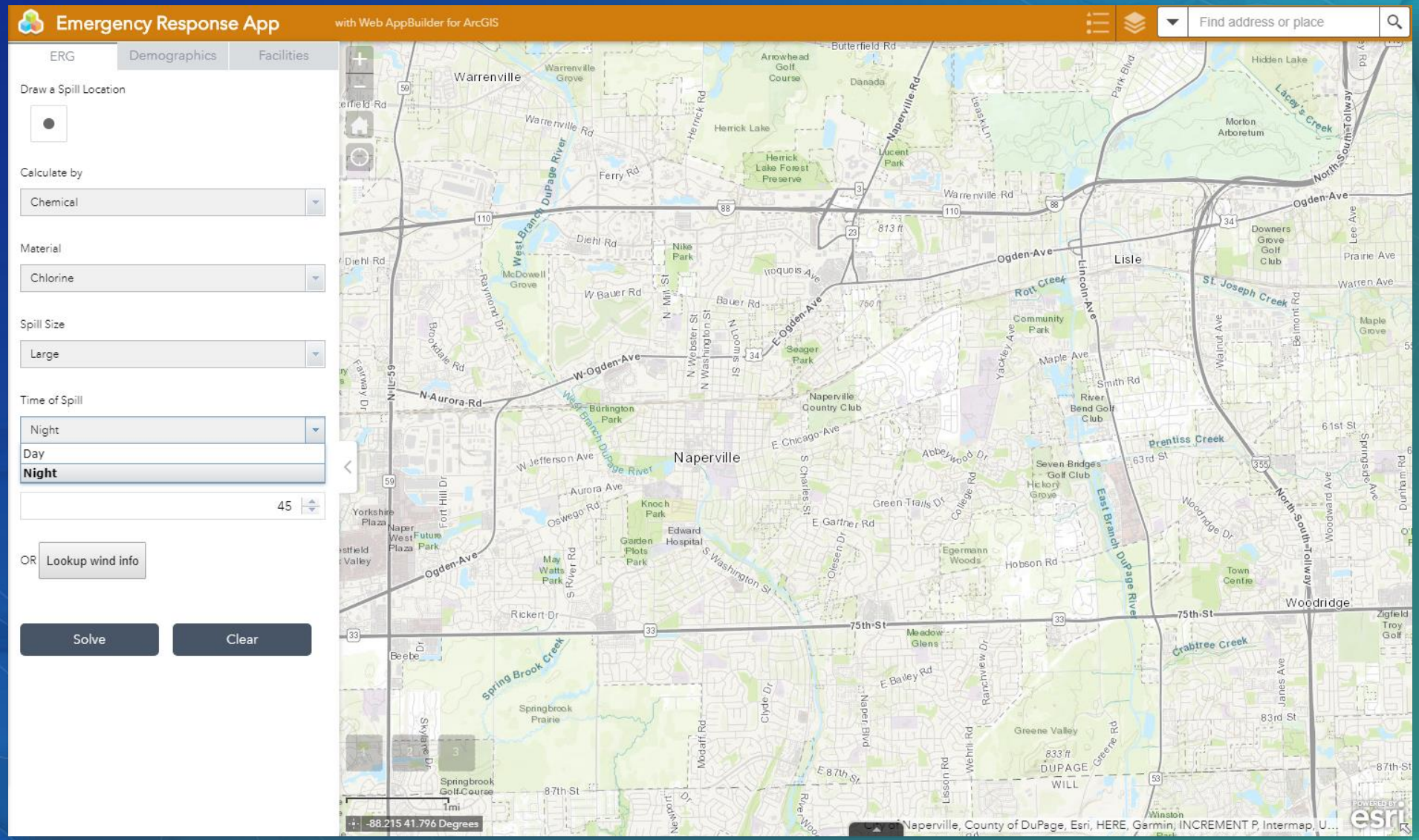
Using the App

Select the Spill Size



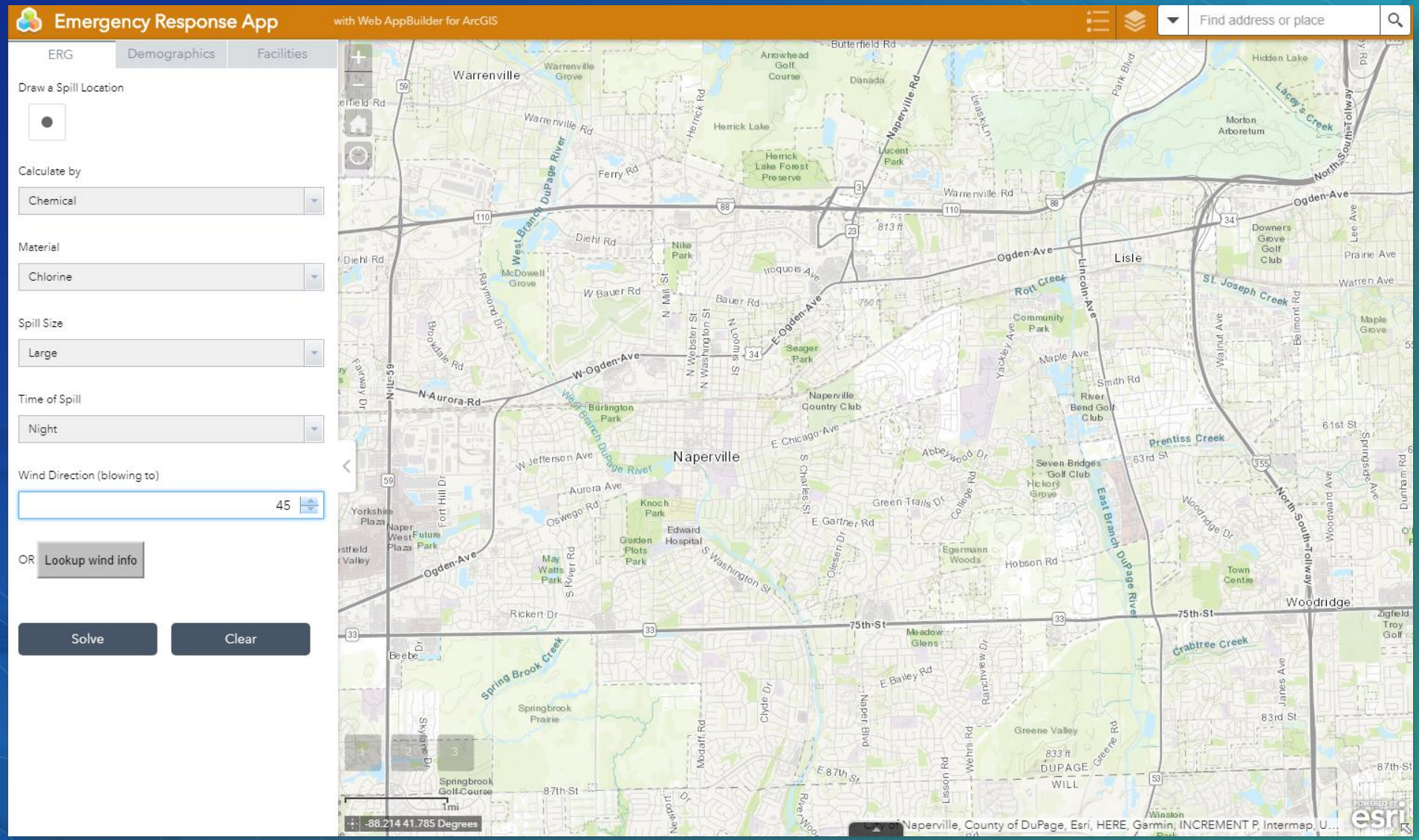
Using the App

Select the time of day



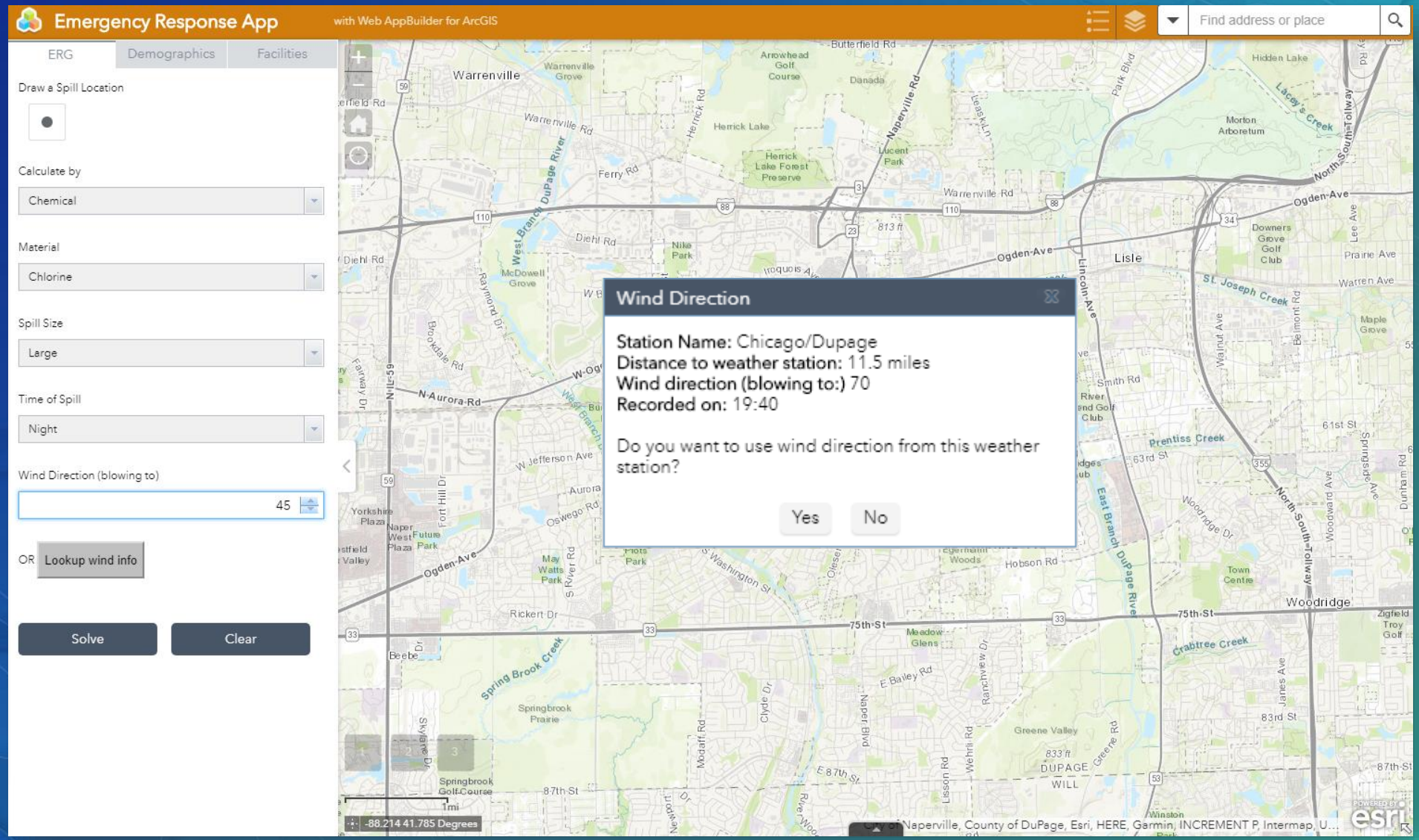
Using the App

Identify the wind direction by entering it…



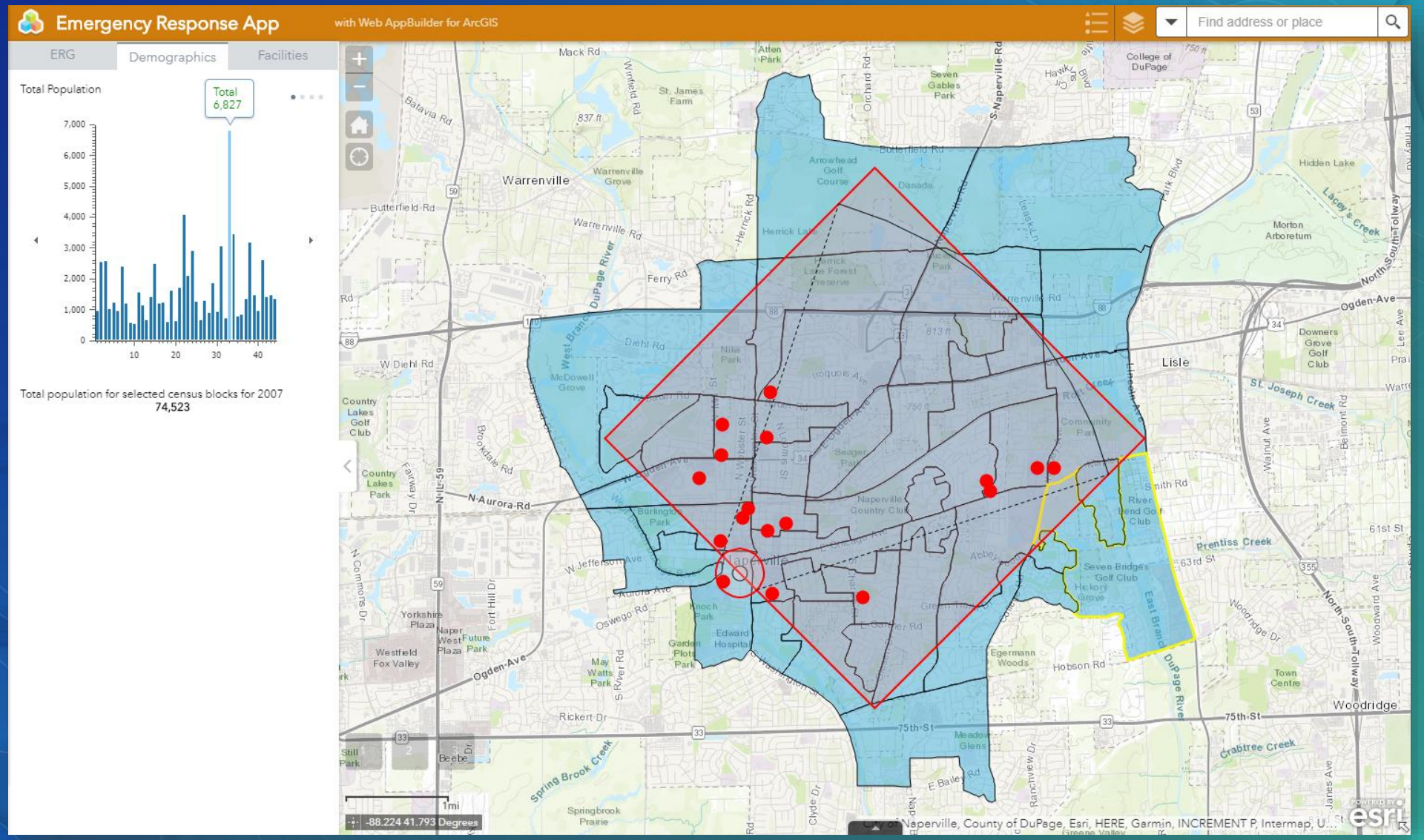
Using the App

… or looking it up using a service



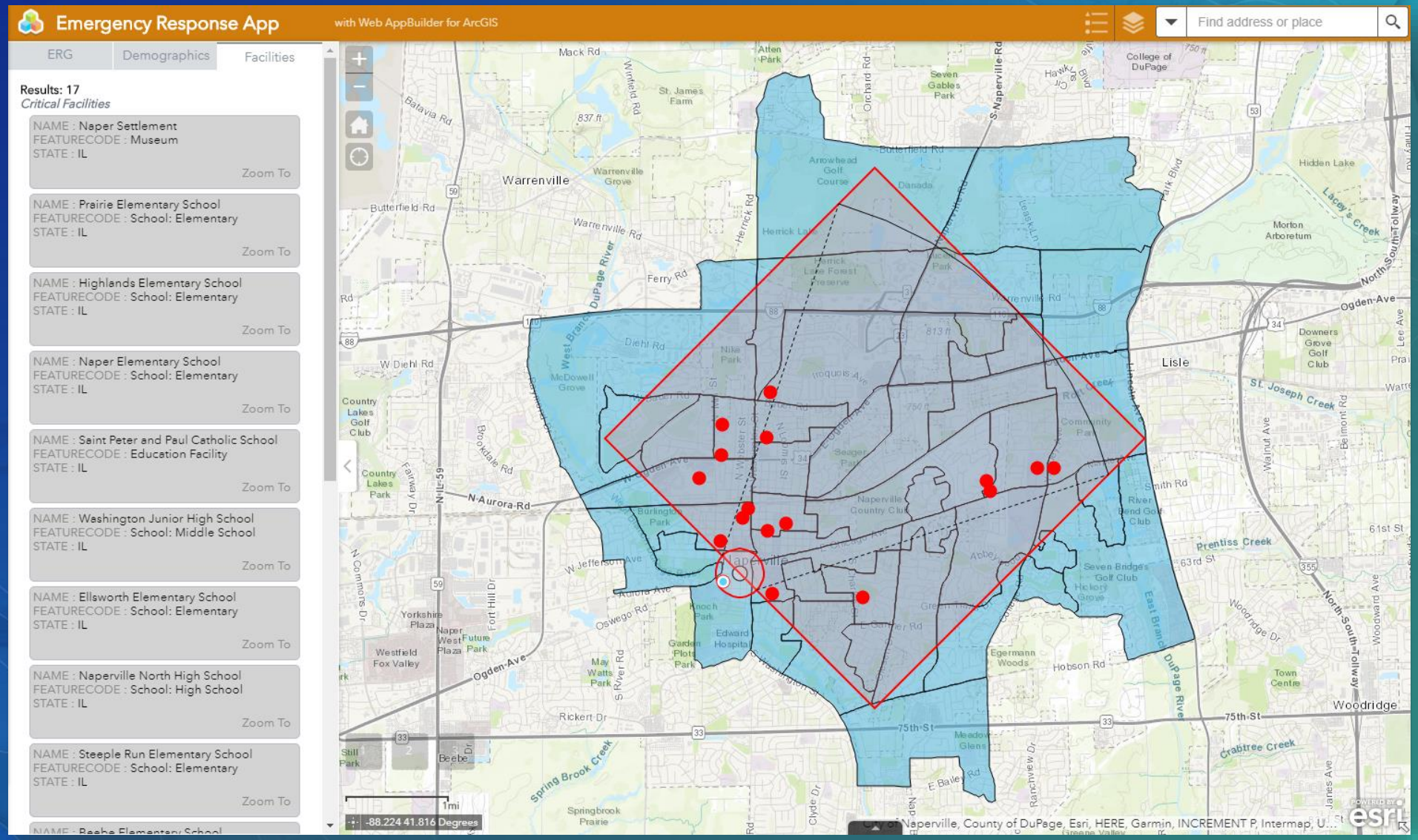
Using the App

Understanding the demographics of the threatened area



Using the App

Identifying the critical facilities in threatened area



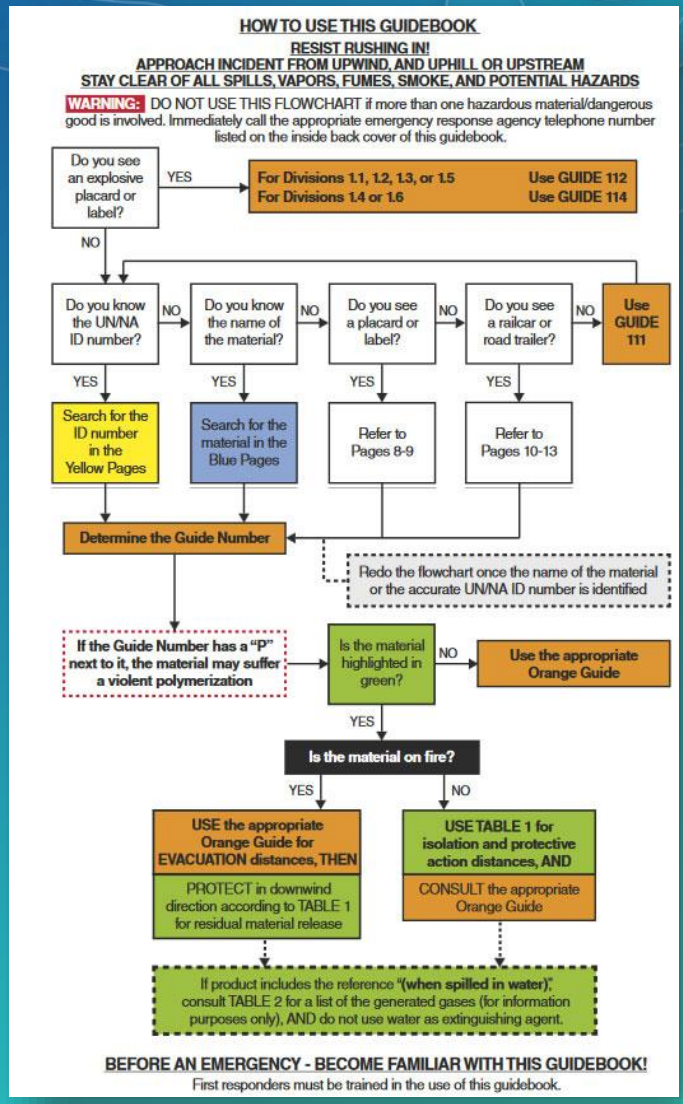
Upcoming

Future plans for the Emergency Response Guide Widget

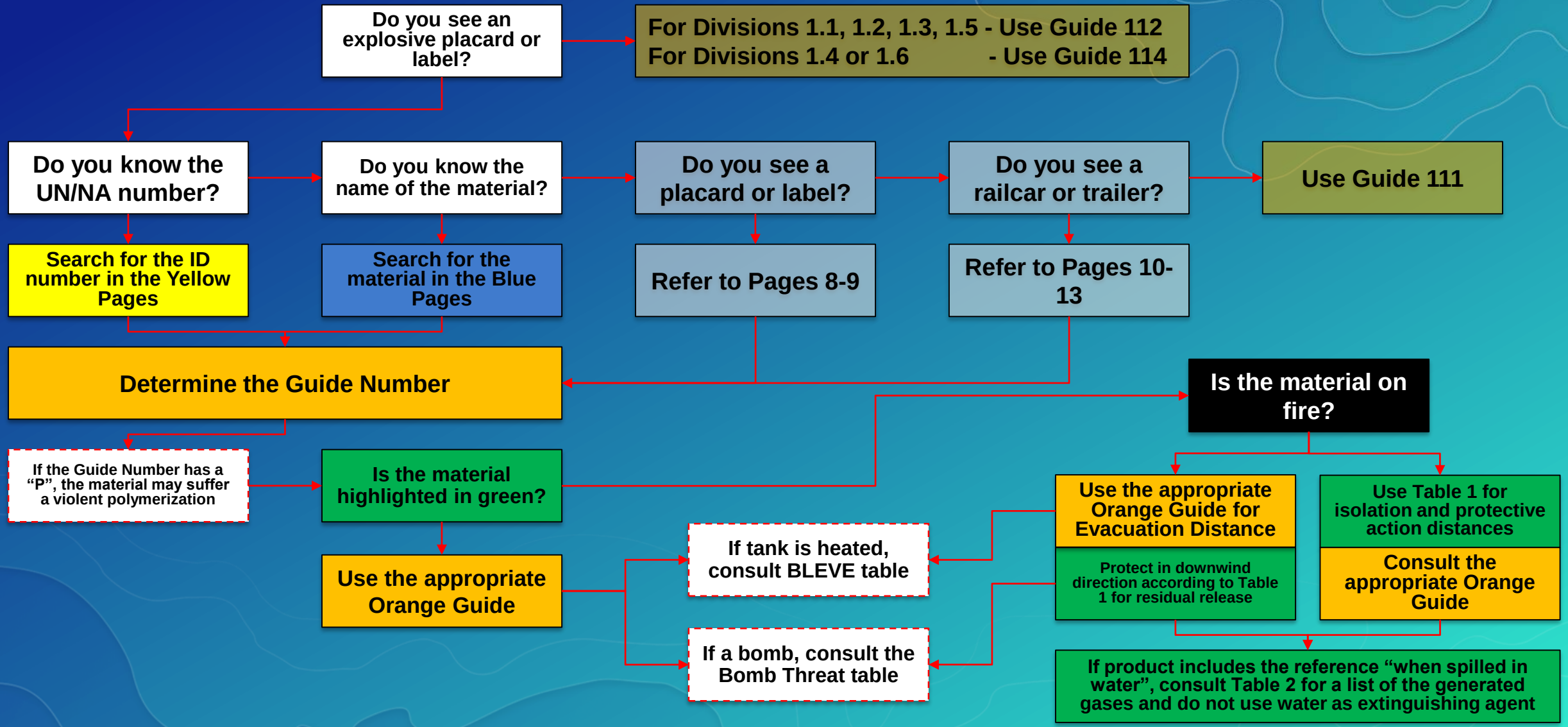
Updates

Fall 2017

- Updates to logic
  - New tables
  - New inputs
- Updates to UI
  - Filter and Sort
  - Output to Services
- Enhancements
  - Add Bomb Threat Tables
- Bug Fixes
- … and more?



ERG Widget 2.x Workflow



References

- ArcGIS Solutions Website
  http://solutions.arcgis.com/
- GitHub
  https://github.com/Esri/solutions-webappbuilder-widgets
- Pipeline and Hazardous Materials Safety Administration (US Department of Transportation)
  https://www.phmsa.dot.gov/hazmat/outreach-training/erg


esri
THE
SCIENCE
OF
WHERE