

IH Emergency Response Operations and Tactics

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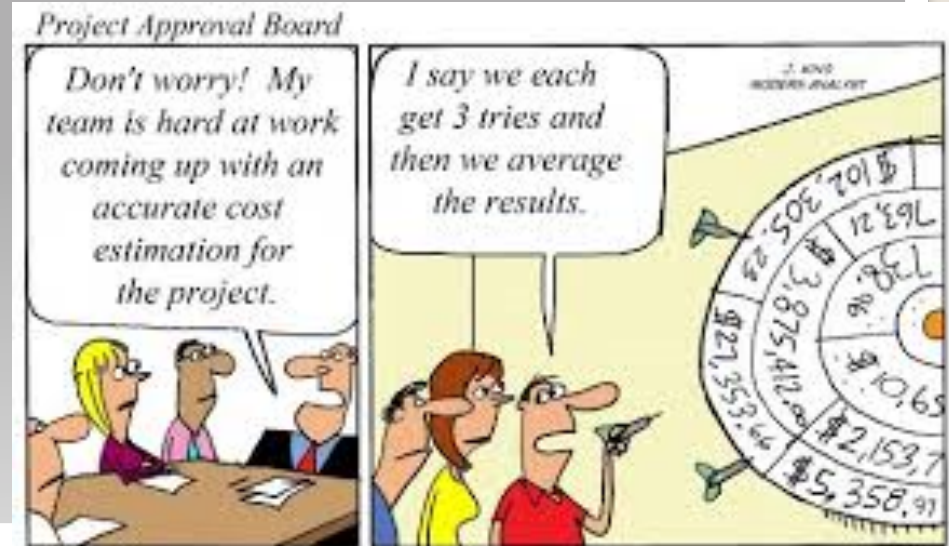
Purpose

- Need enough equipment and personnel to operate for 24 hours.

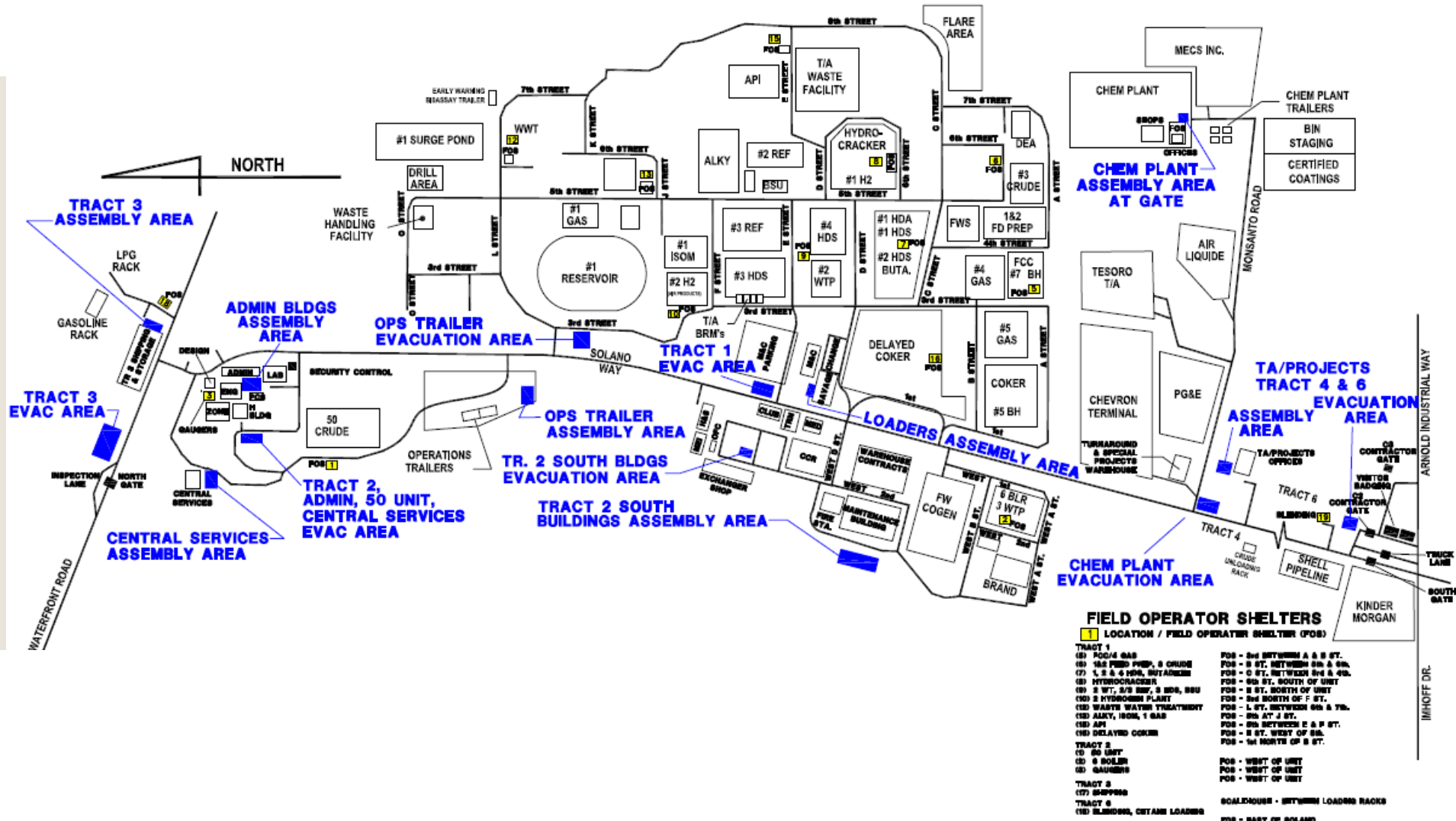


What's the plan?

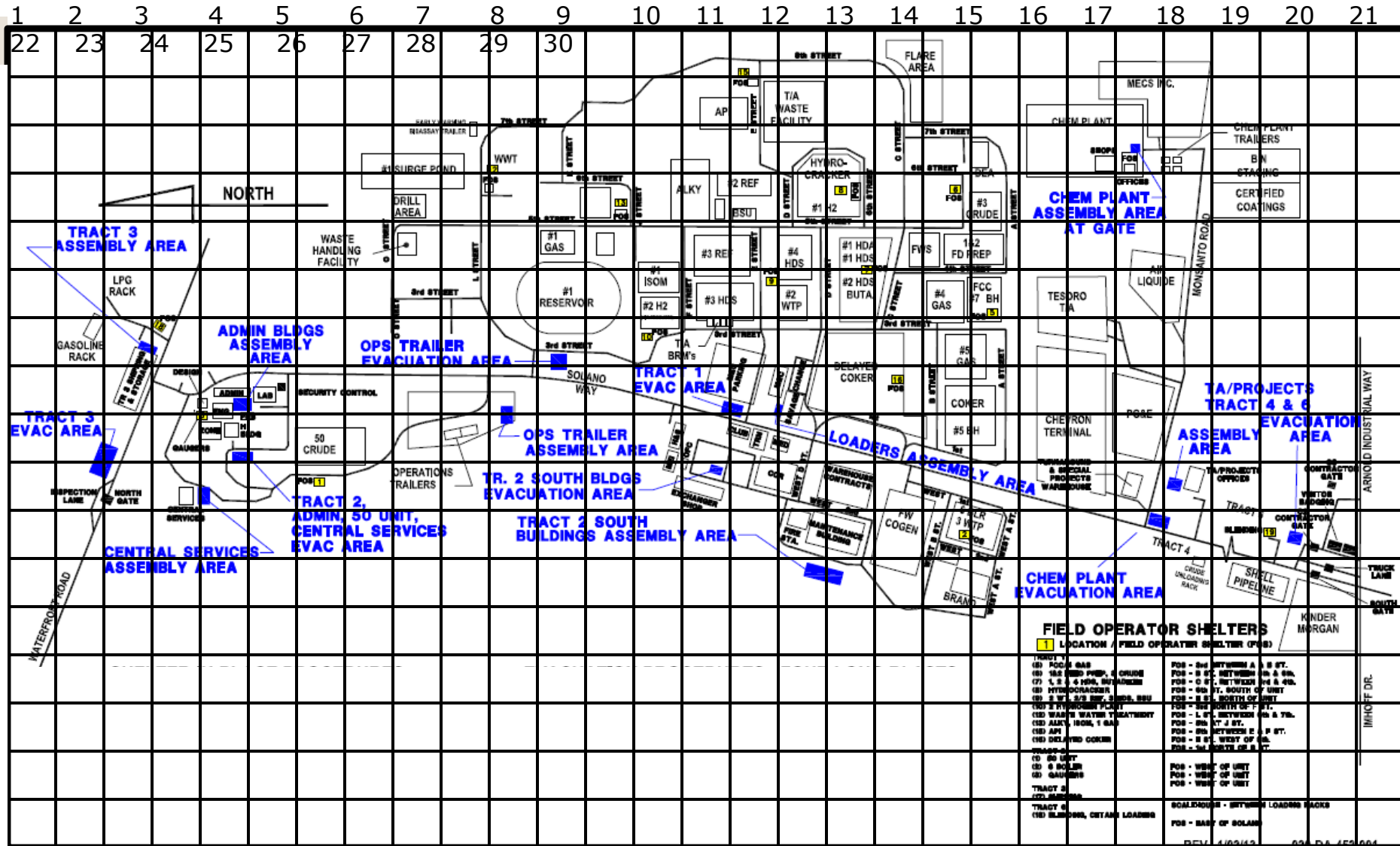
- Precision and accuracy is based on planning and consistency
- Where will I go?
- What will I sample?
- Who is or will be effected?



Mapping Execution



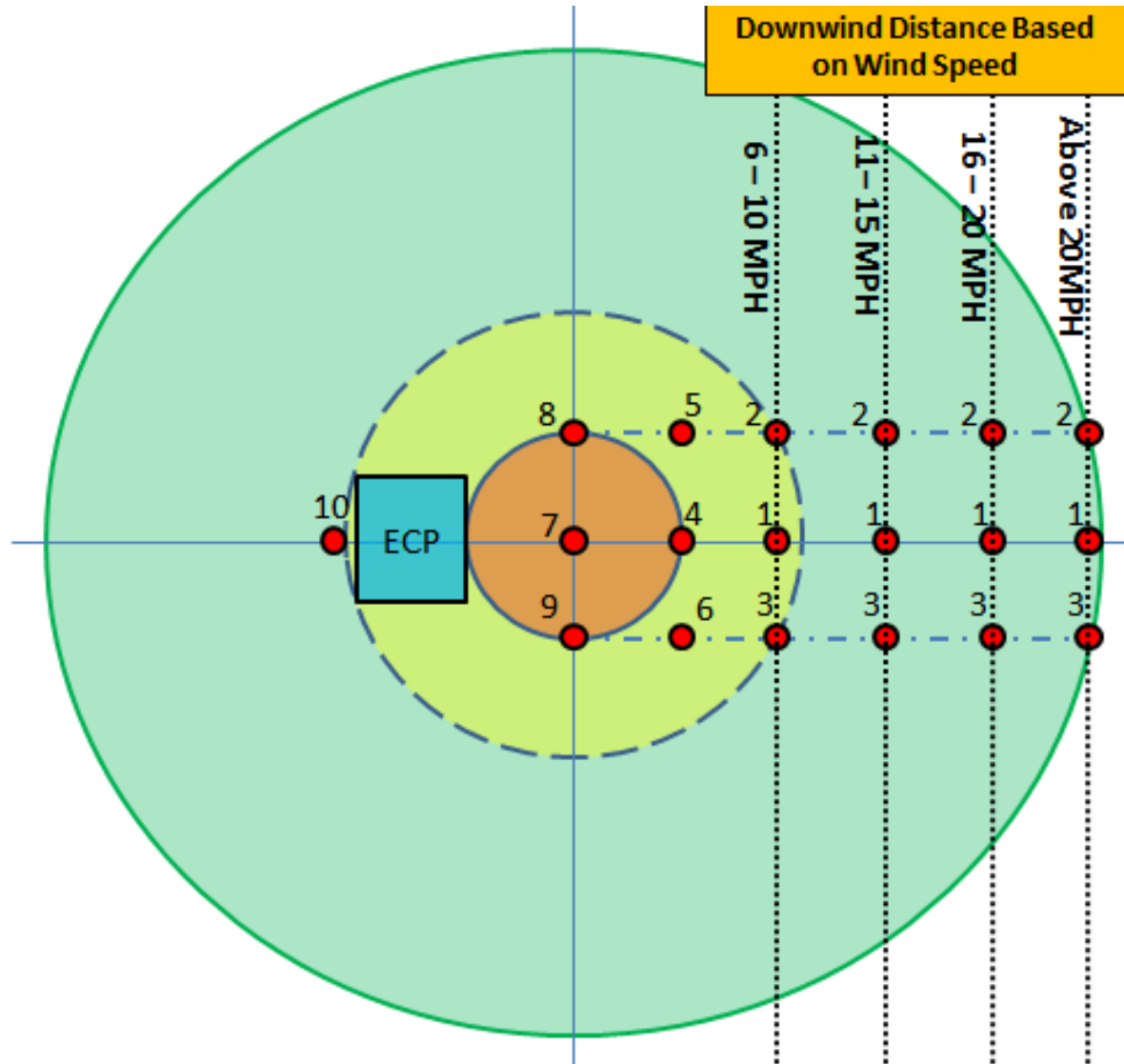
Military Grid Reference System (MGRS)



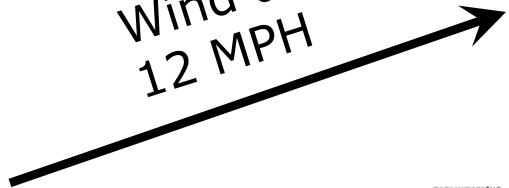
FIELD OPERATOR SHELTERS	
1 LOCATION / FIELD OPERATOR SHELTER (POB)	
(1) POB # 6 GAS	POB - 8th BETWEEN 4 & 5 ST.
(2) 1st 2nd 3rd 4th CRUDE	POB - 8 ST. BETWEEN 1st & 2nd.
(3) HYDROCRACKER	POB - 8th ST. SOUTH OF UNIT
(4) 2nd 3rd 4th 5th 6th 7th 8th 9th	POB - 8 ST. SOUTH OF UNIT
(5) 1st 2nd 3rd 4th 5th 6th 7th 8th 9th	POB - 8th SOUTH OF UNIT
(6) 1st 2nd 3rd 4th 5th 6th 7th 8th 9th	POB - 1st ST. BETWEEN 1st & 2nd.
(7) 1st 2nd 3rd 4th 5th 6th 7th 8th 9th	POB - 2nd ST. J. ST.
(8) AP	POB - 2nd BETWEEN 2 & 3 ST.
(9) DELAYED COCKER	POB - 2 ST. WEST OF 6th.
(10) 30 UNIT	POB - 2nd SOUTH OF 8 ST.
(11) 6 BOLLER	POB - WEST OF UNIT
(12) GAUGERS	POB - WEST OF UNIT
(13) TRACT 2	POB - WEST OF UNIT
(14) TRACT 3	POB - WEST OF UNIT
(15) TRACT 4	POB - WEST OF UNIT
(16) TRACT 5	POB - WEST OF UNIT
(17) TRACT 6	POB - WEST OF UNIT
(18) TRACT 7	POB - WEST OF UNIT
(19) TRACT 8	POB - WEST OF UNIT
(20) TRACT 9	POB - WEST OF UNIT
(21) TRACT 10	POB - WEST OF UNIT
(22) TRACT 11	POB - WEST OF UNIT
(23) TRACT 12	POB - WEST OF UNIT
(24) TRACT 13	POB - WEST OF UNIT
(25) TRACT 14	POB - WEST OF UNIT
(26) TRACT 15	POB - WEST OF UNIT
(27) TRACT 16	POB - WEST OF UNIT
(28) TRACT 17	POB - WEST OF UNIT
(29) TRACT 18	POB - WEST OF UNIT
(30) TRACT 19	POB - WEST OF UNIT
(31) TRACT 20	POB - WEST OF UNIT
(32) TRACT 21	POB - WEST OF UNIT

NBC Overlay

Wind Speed (MPH)	(Knots)	Approximate Downwind Distance (Meters)	(Feet)
6 to 10	4 to 9	1,000	3,300
11 to 15	10 to 13	1,500	5,100
16 to 20	14 to 17	2,000	6,600
Above 20	Above 17	2,500	8,200

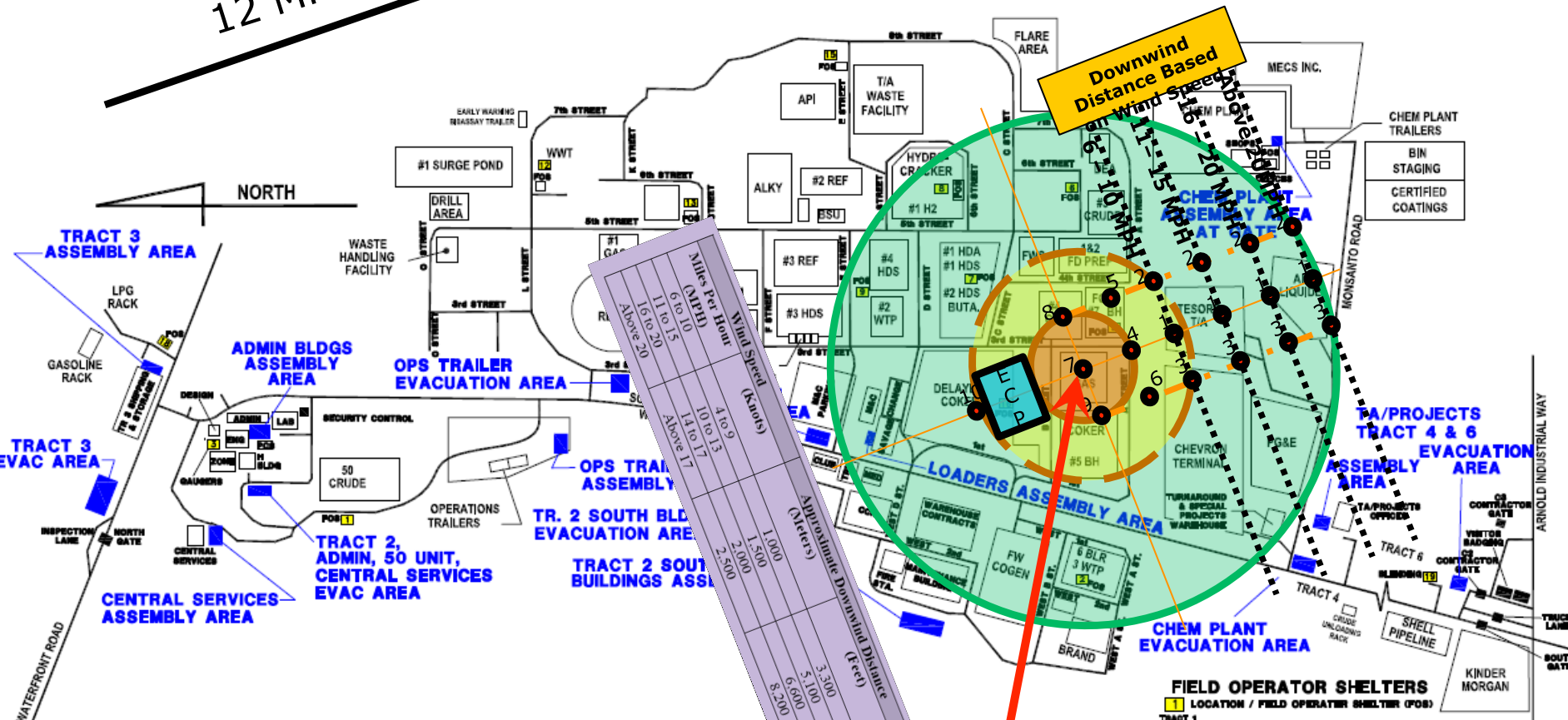


Wind at 12 MPH



Downwind Distance Based
Wind Speed

Miles Per Hour (MPH)	Wind Speed (Knots)	Approximate Downwind Distance (Feet)
6 to 10	4 to 9	1,000
11 to 15	10 to 13	1,500
16 to 20	14 to 17	2,000
Above 20	2,000	2,500
	3,000	3,000
	5,100	5,100
	6,600	6,600
	8,200	8,200



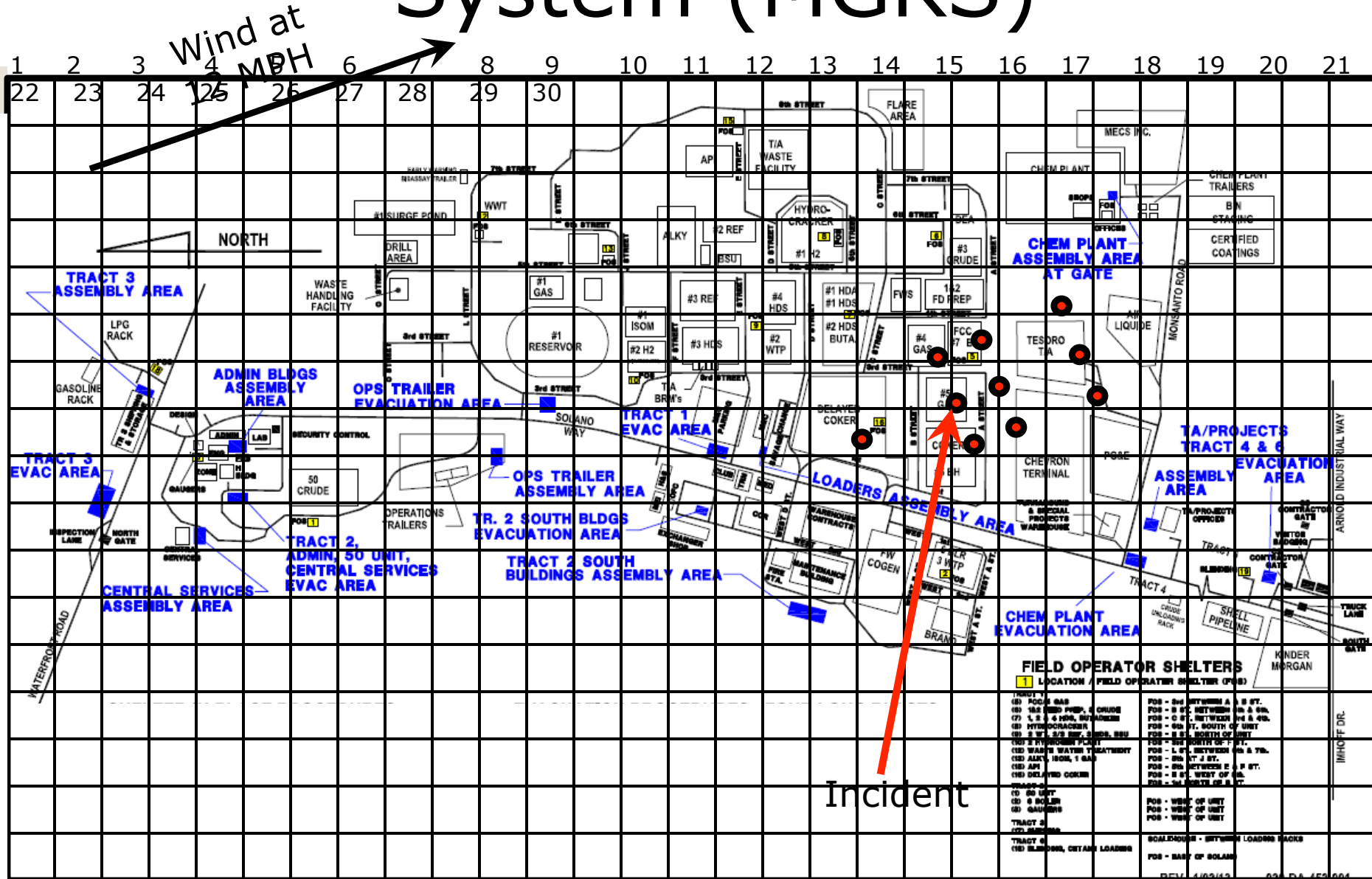
Incident

FIELD OPERATOR SHELTERS

1 LOCATION / FIELD OPERATOR SHELTER (POB)

- TRACT 1
 - (8) FOD/4 GAS
 - (9) 165 POND PUMP, 0 CRUDE
 - (7) 1, 2 & 4 HDS, BUTANES
 - (8) HYDROCRACKER
 - (9) 2 WT, 2/3 REF, 2 SDS, 8SU
 - (10) 2 HYDROGEN PLANT
 - (12) WASTE WATER TREATMENT
 - (13) ALKY, 180L, 1 GAS
 - (13) API
 - (13) DELAYED COKE
- TRACT 2
 - (3) 50 UNIT
 - (3) 0 HOLE
 - (3) GAUGERS
- TRACT 3
 - (17) SHIPPERS
- TRACT 4
 - (13) BLENDING, CERTAIN LOADING
- POB - 2nd BETWEEN A & B ST.
- POB - 8 ST. BETWEEN 8th & 9th.
- POB - 0 ST. BETWEEN 8th & 9th.
- POB - 6th ST. SOUTH OF UNIT
- POB - 8 ST. NORTH OF UNIT
- POB - 2nd NORTH OF F ST.
- POB - 1 ST. BETWEEN 6th & 7th.
- POB - 8th AT J ST.
- POB - 8th BETWEEN E & F ST.
- POB - 8 ST. WEST OF 8th.
- POB - 1st NORTH OF B ST.
- POB - WEST OF UNIT
- POB - WEST OF UNIT
- POB - WEST OF UNIT
- SCALEHOUSE - BETWEEN LOADERS RACKS
- POB - EAST OF SOLARD

Military Grid Reference System (MGRS)



Military Grid Reference System (MGRS)

- List of sample point locations
 - H.8, 19.1 (ECP)
 - H.9, 21.1 (Incident)
 - F.9, 23.8 (sample point #1)
 - G.8, 24. 1 (sample point #2)
 - E.9, 23.2 (sample point #3)

Limits of exposure

- The above information was collected from the DOE SCADA PAC website; <http://www.atlintl.com/DOE/teels/teel/search.html?msg=No%20input.%20Please%20re-enter>.

Levels of Concern (LOCs) Table for TIC				
TIC	LOC Source	Values (ppm)		
		LOC ₃ (Zone 1)	LOC ₂ (Zone 2)	LOC ₁ (Zone 3)
Acetone	AEGL ¹	5700	3200	200
Aluminum oxide	TEEL	25	15	5.7
Ammonia (Anhydrous)	AEGL ¹	1100	160	30
Ammonia (Aqueous)	AEGL ¹	1100	160	30
Arsenic	TEEL	100	17	1.5
Asbestos	TEEL	3.3	0.55	0.05
Benzene	AEGL ¹	4,000	800	52
Butadiene	AEGL ¹	22,000	5,300	670
Butane	AEGL ¹	53,000***	17,000**	5,500*
Carbon Black	TEEL	590 mg/m ³	99 mg/m ³	9 mg/m ³
Carbon Dioxide	TEEL	50,000	40,000	30,000
Carbon Disulfide	AEGL ¹	480	160	13
Chlorine	AEGL ¹	20	2	0.5
Chlorobenzene	AEGL ¹	400	150	10
Diesel	TEEL	20,000	3,300	300
Diethanolamine (DEA)	TEEL	130	28	3
Ethyl Alcohol	ERPG/TEEL	15,000*	3,300* (ERPG)	1,800
Gasoline	ERPG	4,000	1,000	200
Hexane	AEGL ¹	8,600**	2,900*	260
Hydrogen	TEEL	400,000***	230,000***	65,000***
Hydrogen peroxide	ERPG	100	50	10
Hydrogen Chloride (gas)	AEGL ¹	100	22	1.8
Hydrogen Sulfide	AEGL ¹	50	27	0.51
Hydrochloric Acid	AEGL ¹	100	22	1.8
Lead	TEEL	700 mg/m ³	120 mg/m ³	0.15 mg/m ³
LPG (liquid petroleum gas)	TEEL	400,000	230,000	65,000
Methyl Mercury	TEEL	2.1 mg/m ³	0.043 mg/m ³	0.032 mg/m ³
Mercury Vapor	AEGL ¹	8.9 mg/m ³	1.7 mg/m ³	0.15 mg/m ³
Methanol	AEGL ¹	7,200*	2,100	530
Methyl diethanolamine (MDEA)	None listed			
Monoethanolamine (MEA)	TEEL	1,000	170	6
Nitric Acid	AEGL ¹	92	24	0.16
Nitrogen Dioxide	AEGL ¹	20	12	0.5
Nickel	TEEL	99 mg/m ³	50 mg/m ³	4.5 mg/m ³
Nickel Carbonyl	AEGL ¹	0.16	0.036	0.0033

Controls based on chemicals

TIC/TIM Name	Signs/Symptoms			Physical Properties			Personal Protective Equ.			Decon	Response Equipment
	Smells	Short-term exposure	Long-term exposure	Density (g/cm ³)	B.P. (°F)	Vapor Pressure (mmHg)	Respir. Protect	Emer. Use Respirator	Gloves		
Acetone	Sweet, mint-like odor	Irritation of the skin, eyes and respiratory track. May cause dizziness, lightheadedness, and unconsciousness	May crack the skin, reduction of memory, weak legs and arms	0.79	133	180	Supplied Air in continuous-flow mode or PAPR. APR w/ OV cart.	SCBA is unknown IDLH conc. Emergency Escape only: Any FF APR or SCBA	Butyl Rubber gloves	Use only intrinsically safe devices. Soap and water	HAPSITE TVA-1000 HazCat Kit pH paper HazMat ID
Aluminum Oxide	Odorless	Cough if inhaled. Redness in the eyes.	Accumulates in bones – no histological alterations. CNS – neurological degradation potential.	3.95 – 4.1	2,977	N/A	Unknown concentrations require SCBA Emergency Escape only: Any FF APR or SCBA	SCBA in unknown concentrations Emergency Escape only: Any FF APR or SCBA	Nitrile gloves	Soap and water	Require SDS Nephelometer Cyclone + pump Vac-u-tube + 1L bag 10 x 10 cm square + wipes Collection dishes
Ammonia (Anhydrous)	Pungent, suffocating odor	Eye or skin contact can cause irritation, burns, frostbite, blisters, blindness, and death. Coughing wheezing and shortness of breath. High does pulmonary edema, headache, loss of sense of smell, nausea and vomiting.	Chronic eye, nose and throat irritation. Bronchitis with coughing, shortness of breath, and phlegm. Biological changes in the spleens, kidneys and livers.	N/A	- 33.34	6460	Supplied Air in continuous-flow mode or PAPR. APR w/ ammonia cartridge	SCBA is unknown IDLH conc. Emergency Escape only: Any FF APR or SCBA	Butyl rubber/neoprene, viton/neoprene	Neutralize with hydrochloric acid. Clean with water not soap	MX6 with NH3 MultiRAE with NH3 pH paper Draeger Tube

Smart Cards

Hydrochloric Acid/Nitric Acid

Application Range

Standard Measuring Range:

Substance:

Hydrochloric acid/nitric acid:

Standard Measuring Range:

1 to 10 ppm /

1 to 15 ppm

Number of Strokes n:

10 / 20

Time for Measurement: approx.

1.5 min / approx. 3 min

Standard Deviation: □

30 %

Color Change:

blue → yellow

Ambient Operating Conditions

Temperature:

5 to 40 °C for HCl

For HNO₃ measurements, the tube scales are applicable only to 20 °C. Where the temperature is different, the measuring result must be multiplied as follows:

Temperature °C	Factor
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40	0.3
----	-----

30	0.4
----	-----

10	2
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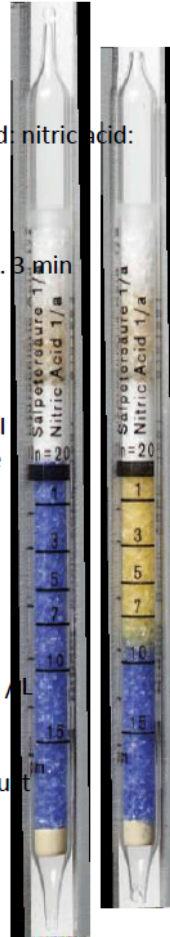
Absolute Humidity: max. 15 mg H₂O / L

Reaction Principle

HCl and/or HNO₃ + pH indicator → yellow reaction product

Cross Sensitivity

50 ppm nitrogen dioxide result in almost the same reading as 2 ppm nitric acid. 10 ppm hydrogen sulfide or 5 ppm nitrogen dioxide do not effect the reading. Chlorine concentrations in excess of 1 ppm change the entire indicating layer to a yellow-green.



- Smart cards are provided to Fire Marshals, Safety personnel. These cover all IH response equipment

Uses

- Radiation fire
- Unknown release (gas/liquid)
 - To include monitoring during a Flare event
 - Boiler going down, and smoke released
- Corrosive release
- Chemical Spill in Water
- Fire Response
- Cooling Tower uncontrolled release

Working with the IC

- Checklists are designed to provide health risk assessments for both Emergency Responders and the surrounding Community
- New equipment and plume modeling.
 - Evacuation, or shelter in place decision making is quicker
 - Hot Washes can incorporate watching how the plume or level evolves through in incident



SAFER

- AreaRAE's and MultiRAE's
- Weather stations
- repeaters
- Vehicle
- Anyone with access to our intranet can link into this program
- IH and IC and see a live feed of the plume evolving

ary Temple Chris


Met Conditions at 2017-03-03 14:30



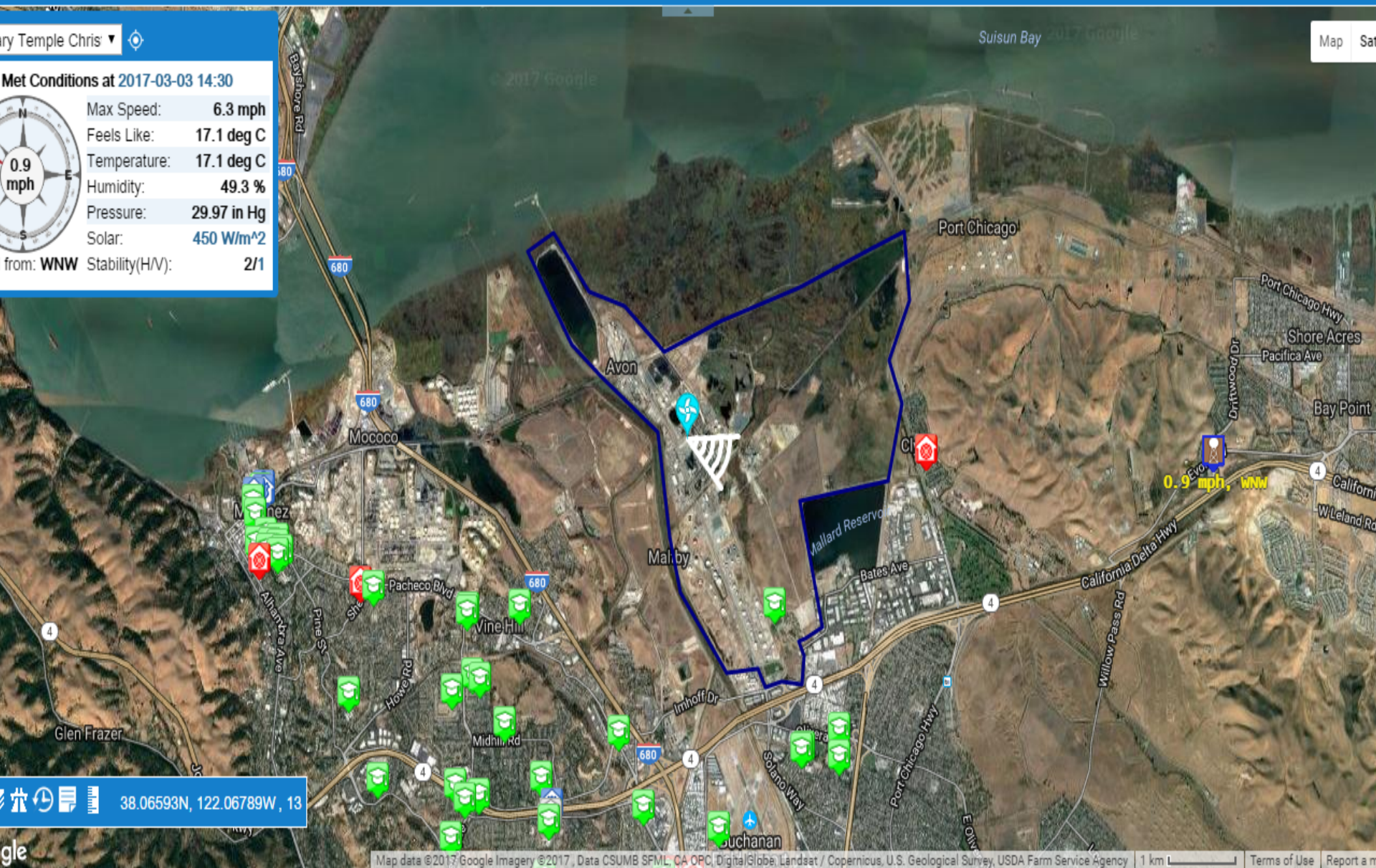
Max Speed:	6.3 mph
Feels Like:	17.1 deg C
Temperature:	17.1 deg C
Humidity:	49.3 %
Pressure:	29.97 in Hg
Solar:	450 W/m ²
from: WNW	Stability(H/V): 2/1

38.06499N, 122.07785W, 13

Met Conditions at 2017-03-03 14:30



Max Speed:	6.3 mph
Feels Like:	17.1 deg C
Temperature:	17.1 deg C
Humidity:	49.3 %
Pressure:	29.97 in Hg
Solar:	450 W/m^2
from: WNW	Stability(H/V): 2/1



38.06593N, 122.06789W, 13

Gas Release Event

HYDROGEN SULFIDE - Gas Release

Concentration (ppm)	0.51	27	50
Distance (mile)	2.5	0.5	0.3

[ERG Guide 117](#)

Chemical: **HYDROGEN SULFIDE**

Release Time: **2017-03-03 14:32**

Release Rate: **25 lb/min**

Duration: **10 min**

Chemical Strength (by mass): **Pure Chemical**

Temperature: **63.1 deg F**

Release Height: **Ground Level**

Max Speed: **3.7 mph**

Feels Like: **17.9 deg C**

Temperature: **17.9 deg C**

Humidity: **47.1 %**

Pressure: **29.97 in Hg**

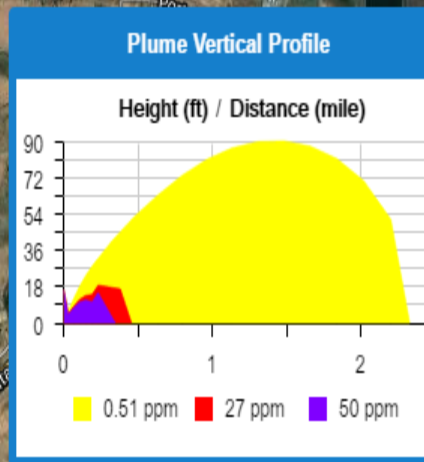
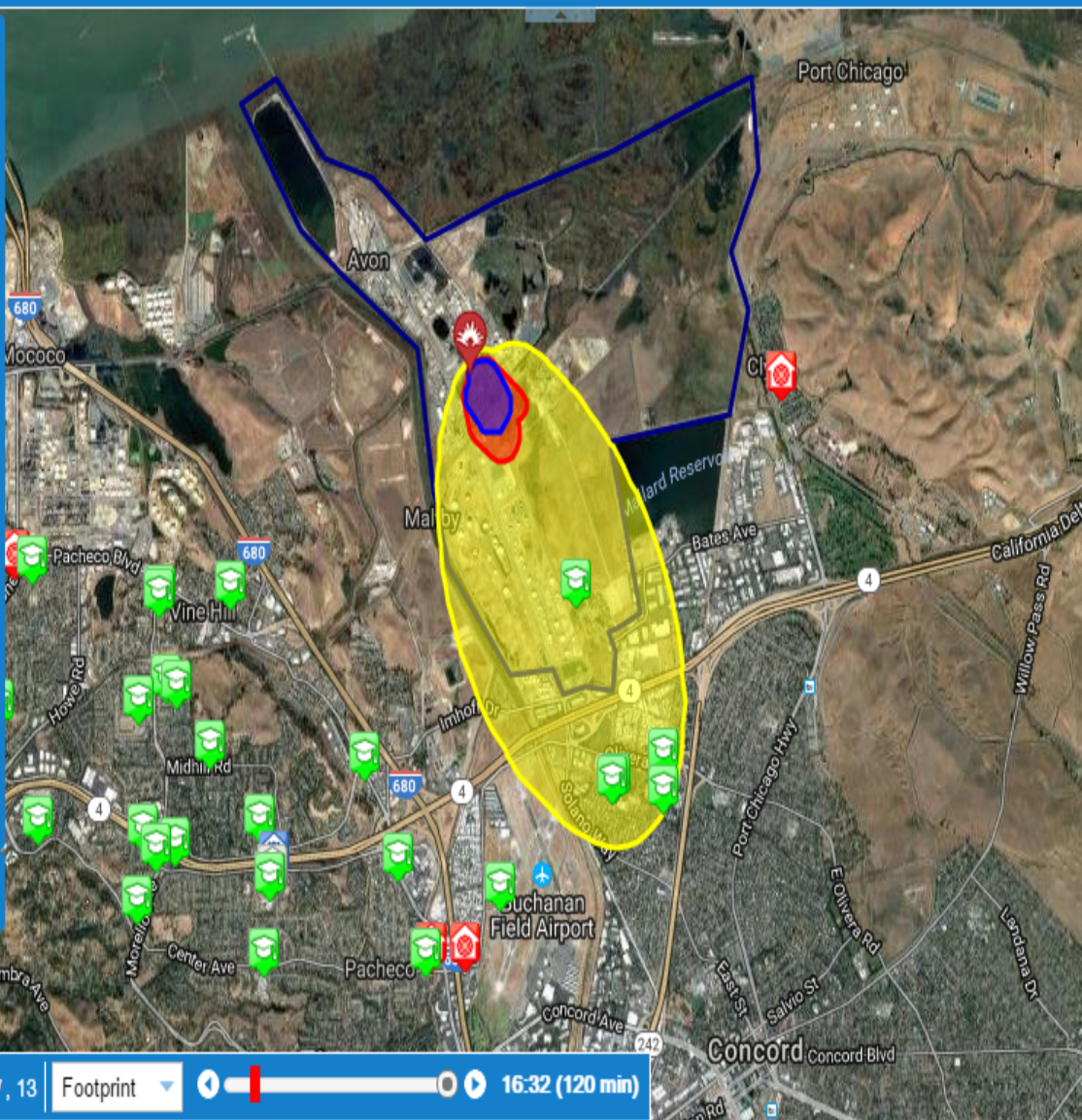
Solar: **431 W/m^2**

Wind from: **NNW** Stability(H/V): **1/1**

Ignite
Update and Run
Close

Possible Impacted Places

38.04755N, 122.03442W, 13
Footprint
16:32 (120 min)



Search for location

Martinez Refinery

Charlie Algier (impersonated)

Back Calculation

Chemical: HYDROGEN SULFIDE -

Release Time: 2017-03-03 14:43

Release Height (ft): Ground Level

Release Type: Continuous



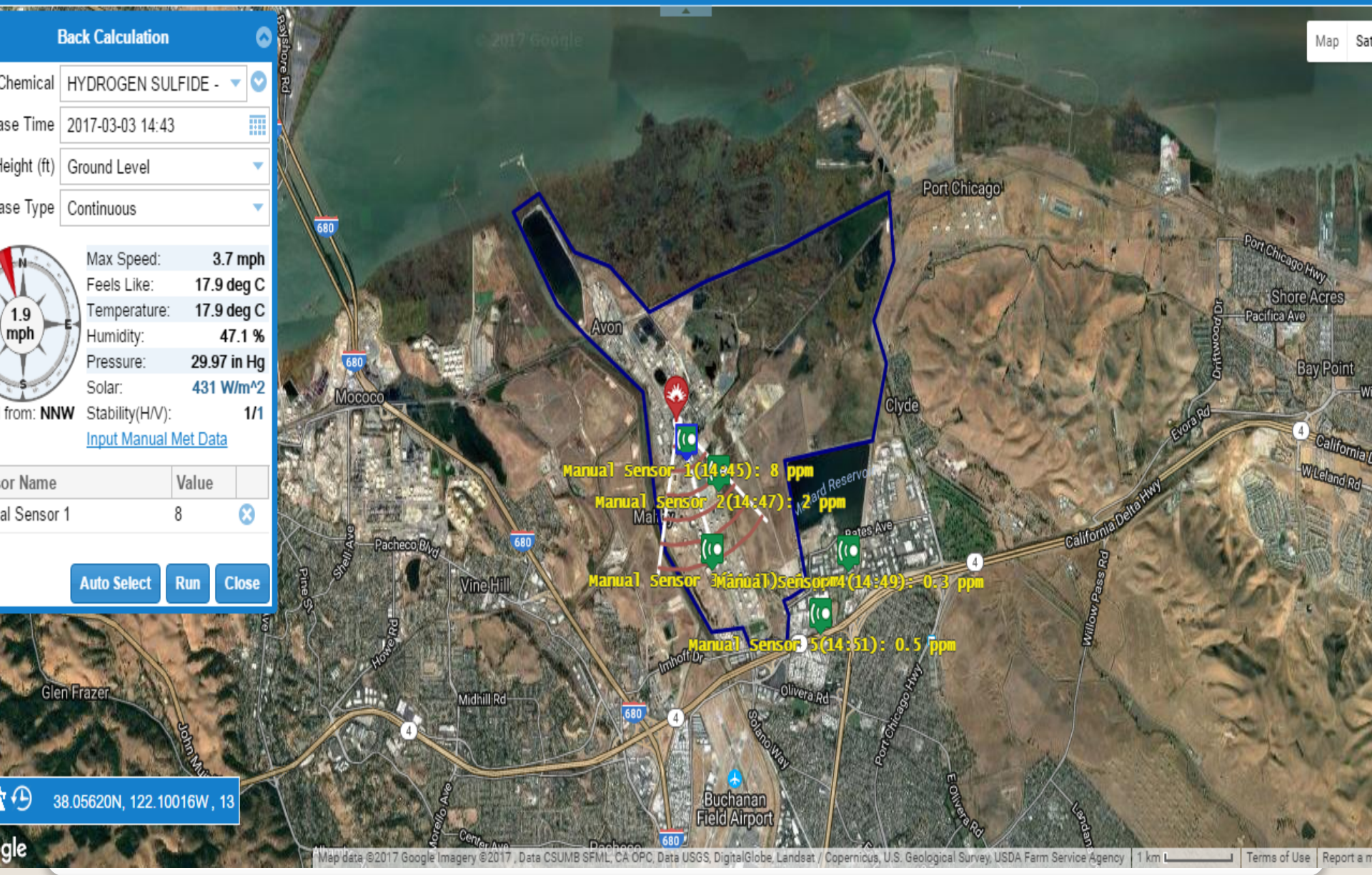
Max Speed: 3.7 mph
 Feels Like: 17.9 deg C
 Temperature: 17.9 deg C
 Humidity: 47.1 %
 Pressure: 29.97 in Hg
 Solar: 431 W/m²
 from: NNW Stability(H/V): 1/1

[Input Manual Met Data](#)

Sensor Name	Value
Manual Sensor 1	8

Auto Select Run Close

38.05620N, 122.10016W, 13



Back Calculation Event

HYDROGEN SULFIDE - Back Calculation

Concentration (ppm): ■ 0.51 ■ 27 ■ 50

Distance (mile): 1.1 0.2 0.1

[ERG Guide 117](#)


Event Name: **HYDROGEN SULFIDE**

Release Time: 2017-03-03 14:43

Release Type: Continuous

Release Height: Ground Level

Release Rate: [2.63 lb/min](#)



Max Speed: 3.7 mph

Feels Like: 17.9 deg C

Temperature: 17.9 deg C

Humidity: 47.1 %

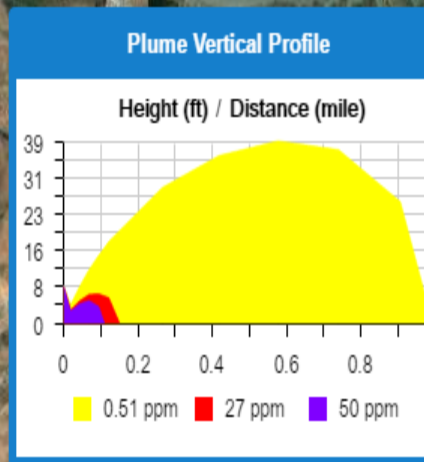
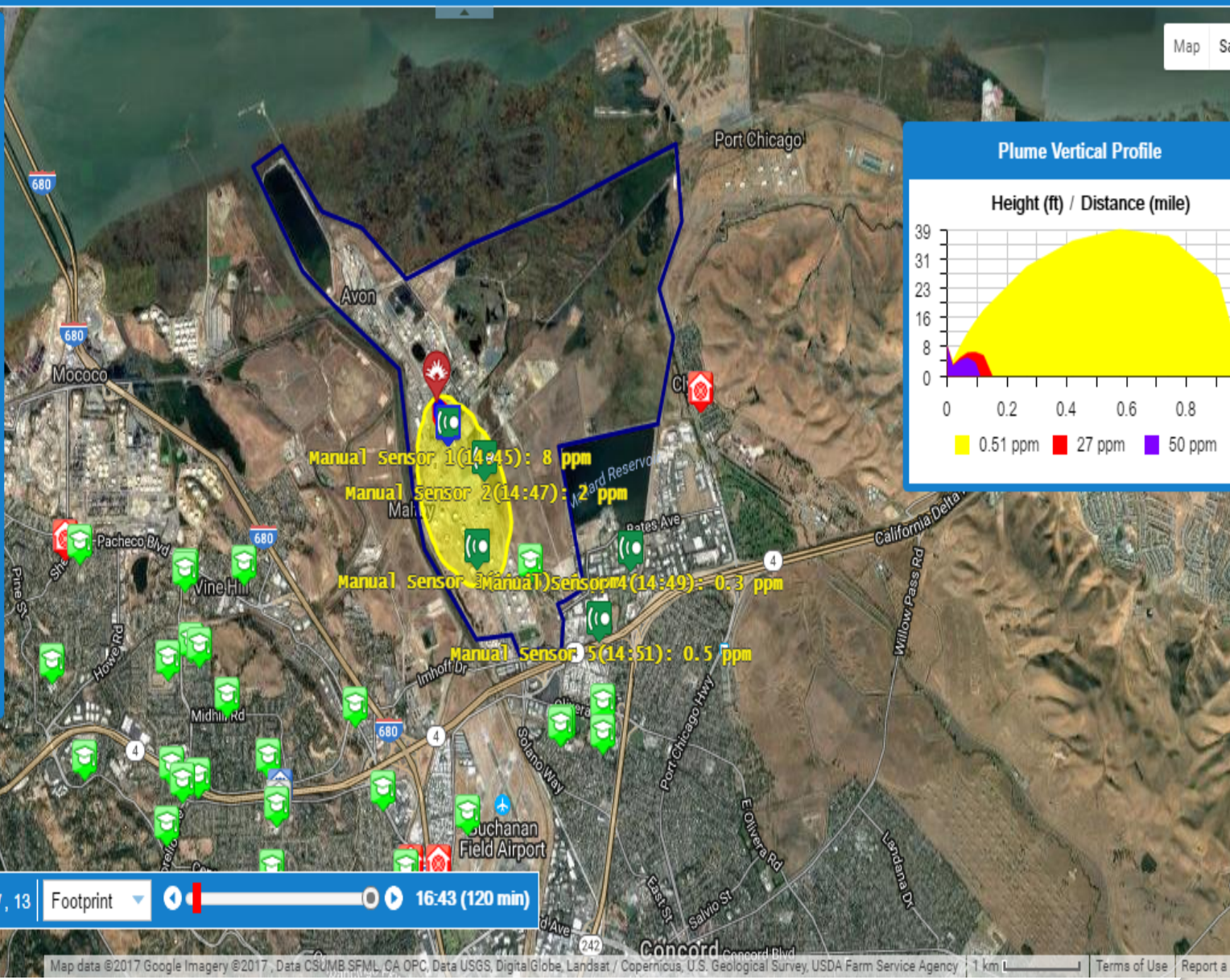
Pressure: 29.97 in Hg

Solar: 431 W/m²

Wind from: NNW Stability(H/V): 1/1

Sensor Name	Value
Manual Sensor 1	8

Update and Run
Close



Additionally

- Mutual Aid when activated, can assist in setting AreaRAE's and collecting physical samples.