

The Grand Traverse Overall  
Supply Site  
Leelanau County  
Greilickville, Michigan

Public Meeting  
August 30, 2005

# U.S. EPA ACTIVITIES SINCE SEPTEMBER 2004

September 2004 –MDEQ  
requested U.S. EPA  
assistance to evaluate  
source area identified  
under GTOS building.



# U.S. EPA ACTIVITIES SINCE SEPTEMBER 2004

- October 2004 through February 2005 - U.S. EPA's Environmental Response Team (ERT) prepares for indoor air and soil gas survey at former GTOS building.

# U.S. EPA ACTIVITIES SINCE SEPTEMBER 2004

- March 2005 – ERT conducts indoor air and soil gas survey beneath former GTOS building including:
  - real time monitoring using the Trace Atmospheric Gas Analyzer (TAGA) bus
  - air sample collection using Tedlar bags and Summa Canisters.









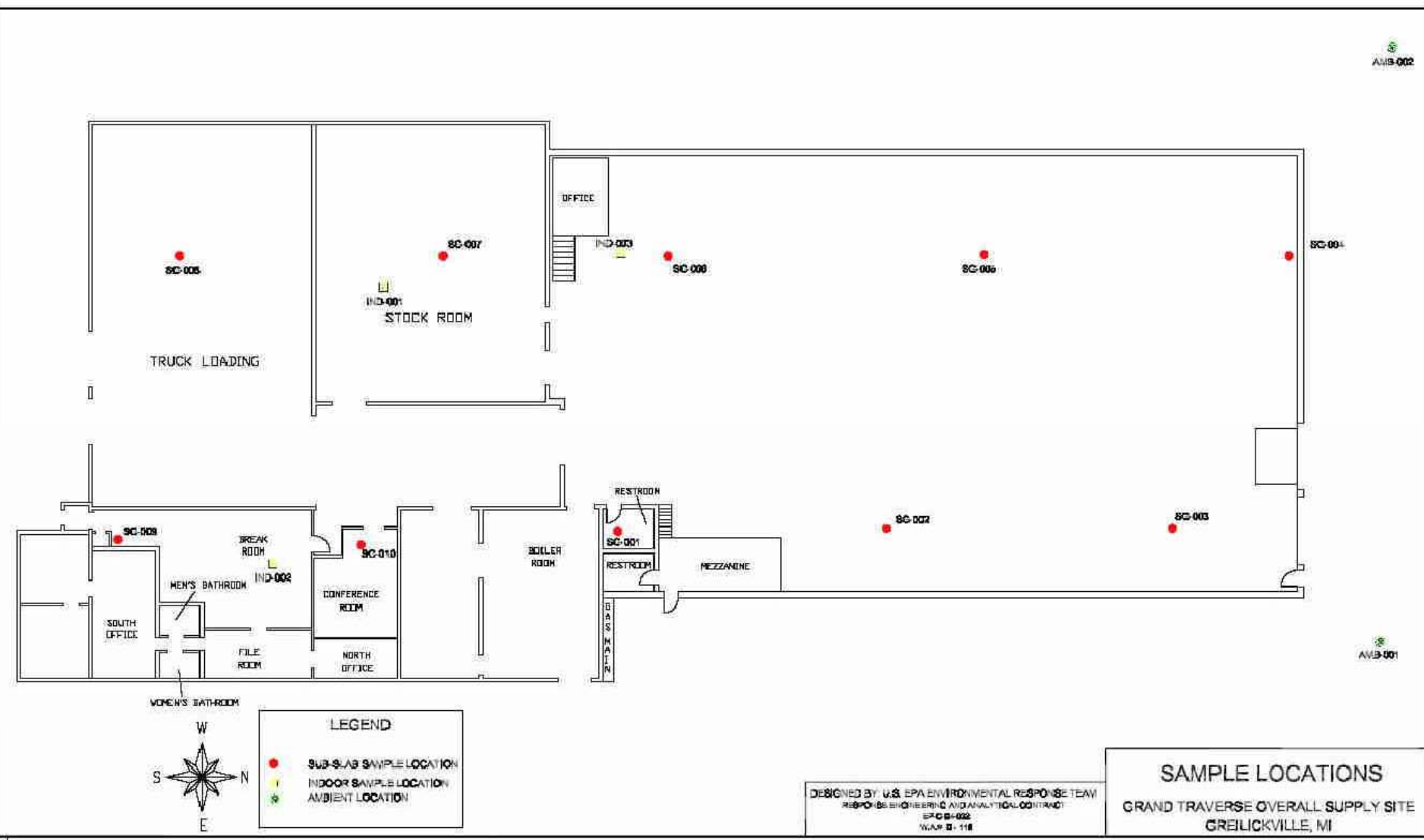
# U.S. EPA ACTIVITIES SINCE SEPTEMBER 2004

## Survey Results

- Contaminants detected in indoor air and soil gas beneath GTOS building slab.
- Michigan Department of Community Health (MDCH) and the Agency for Toxic Substances and Disease Registry (ATSDR) develop health based screening levels for indoor air and sub slab soil gas for Norris School inhabitants.



# GTOS Building Air Sampling Locations



**LEGEND**

- SUB-SLAB SAMPLE LOCATION
- INDOOR SAMPLE LOCATION
- AMBIENT LOCATION

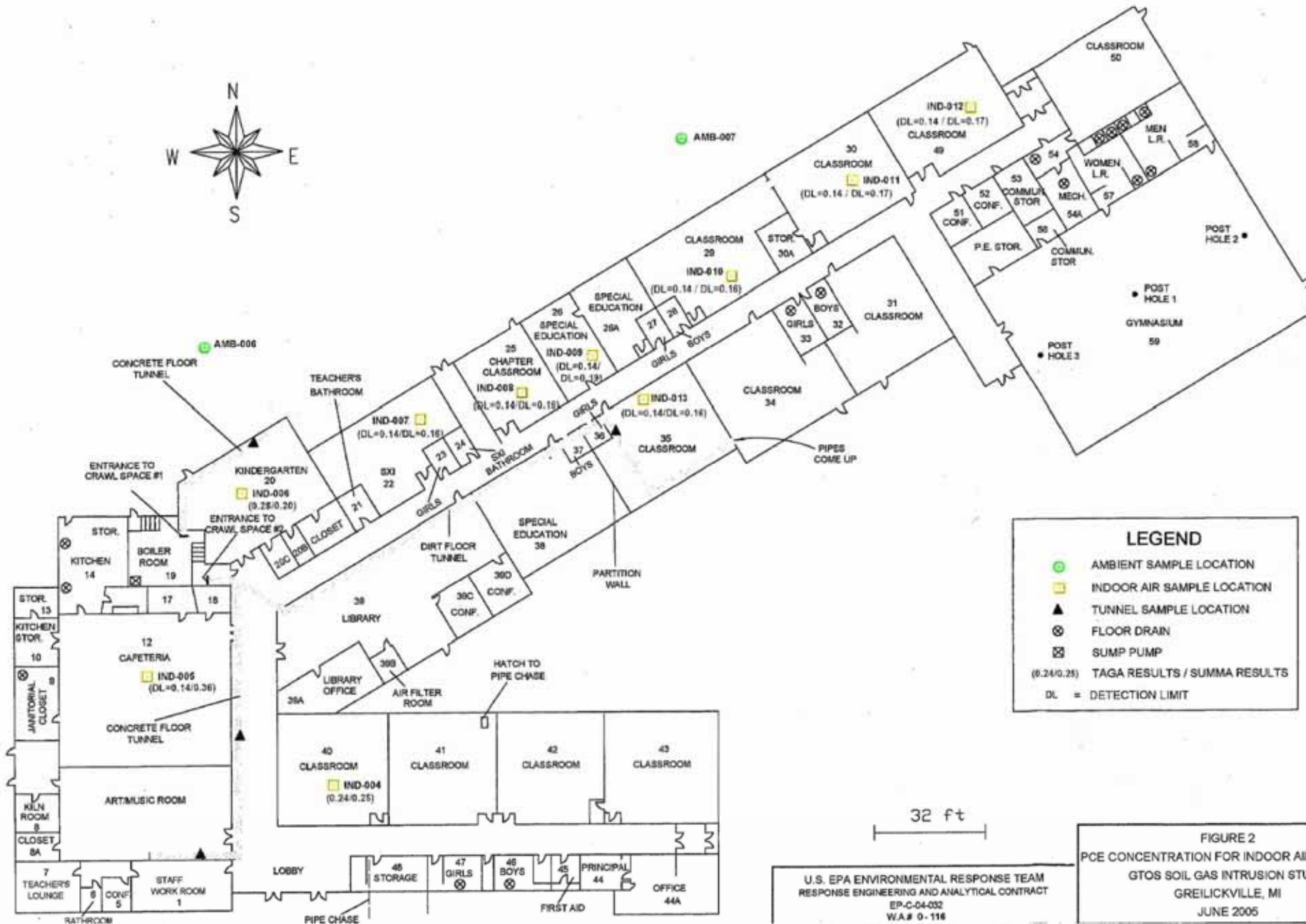
DESIGNED BY: U.S. EPA ENVIRONMENTAL RESPONSE TEAM  
 RESPONSE ENGINEERING AND ANALYTICAL CONTRACT  
 EPC-B-002  
 WAP 0-118

**SAMPLE LOCATIONS**  
 GRAND TRAVERSE OVERALL SUPPLY SITE  
 GREELICKVILLE, MI

# U.S. EPA ACTIVITIES SINCE SEPTEMBER 2004

- March 2005 – ERT conducted indoor air and sub slab soil gas survey at Norris Elementary School.

# Norris School Indoor Air Sampling Locations





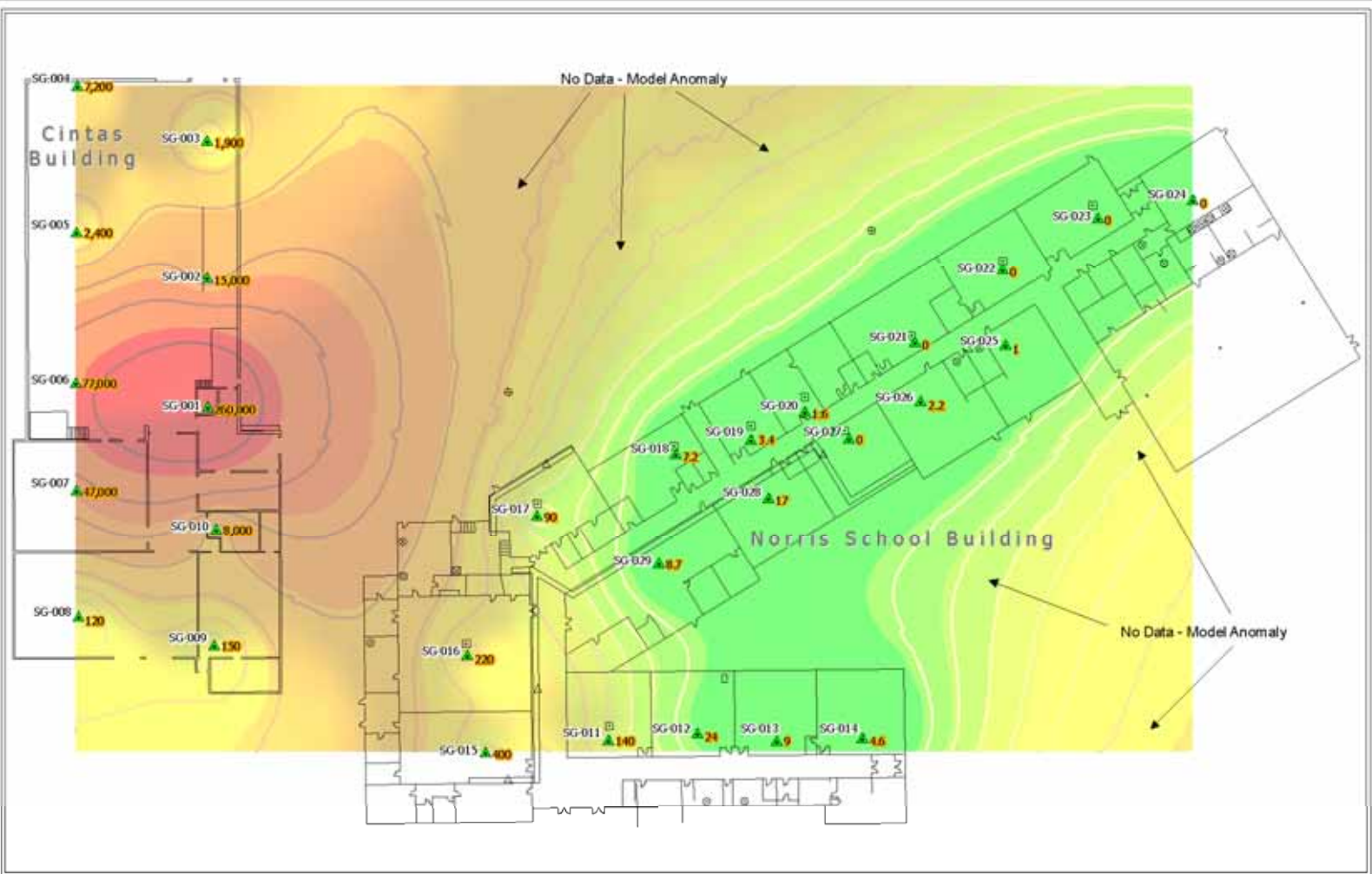


Tedlar Bag Sampler



Summa Canister Sampler

# Soil Gas Concentration Isocontours



**Geostatistical Summary**

A Simple Kriging Prediction Map was generated using field of 2,484 Cassette data values for a soil gas intrusion study. Samples locations were not randomly generated.

Model Process:  
Selected Method: Simple Kriging  
Output: Prediction Map

Number of Points: 29  
Mean Value: 0  
Geocoding:  
Method: None  
Transformation: Normal Score (Gaussian kernel Method)  
Semi-variogram and Covariance:  
Model: 0.907201\*Spherical(75.744)+0\*Hugger  
Error modeling:  
Microstructure: 0 (100%)  
Measurement error: 0 (2%)  
Searching Neighborhood:  
Neighbors to Include: 5 or at least 4 for each angular sector  
Searching Clipper:  
angle: 0  
Major Semivari: 75.744  
Minor Semivari: 75.744  
Angular Sectors: 0  
Bivariate Distribution was not examined.

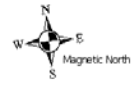
**Legend**

- Sample Locations
- PCE Concentrations**
- 0 - 30.67
- 30.67 - 110.04
- 110.04 - 315.40
- 315.40 - 846.82
- 846.82 - 2,221.93
- 2,221.93 - 5,780.21
- 5,780.21 - 14,987.75
- 14,987.75 - 38,813.52
- 38,813.52 - 100,465.95
- 100,465.95 - 260,000

Map created using un-referenced AutoCAD drawing and USGS DOQs. AutoCAD drawing georeferenced to USGS DOQs at +/- 1.5 meters spatial accuracy.

Map Creation Date: 24June2005

Coordinate system: UTM  
Zone: 16N  
Datum: NAD83  
Units: Meters



**Model Analysis:**  
The model assumes a steady, continuous state and does not reflect variability in physical conditions, interferences or obstructions. The model does not account for saturation, volatility or any other chemical or physical parameters.



**D R A F T**

U.S. EPA Environmental Response Team  
Response Engineering and Analytical Contract  
EP-C-04-032  
W.A.# 0-116

**Figure 1**  
**PCE Concentrations**  
**GTOS Soil Gas Intrusion Site**  
**June 2005**  
**Greilickville, MI**

D:\w\env\projects\env\F00-116  
MFD file: g:\arcinfo\project\year4\EA00116\_GTOS\_SoilGas\116\_geostatsumma\_fr  
Revision #: 003

# Indoor Air Sampling at Norris Elementary School



# Screening Levels

- MDEQ draft acceptable indoor air concentrations (AIAC)
- Protective for children and adults who will occupy a building:
  - 24 hours per day
  - 350 days per year
  - for 30 years

# Immediate Action Levels

- ATSDR Intermediate Environmental Media Evaluation Guides (EMEGs)
- Protective for children and adults who will occupy a building for up to one year.

# Decision Matrix

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Indoor Air Level	Conclusion
Less than screening level	no risk
Between screening level and immediate action level	more monitoring and protective measures within a few months
Above immediate action level	relocate children and staff

# Indoor Air Concentrations of VOCs at the Norris Elementary School (March 2005)

	Screening Level	Action Level	Grab Samples	24-Hour Samples
PCE	6.2	40	ND-1.1	ND-0.74
TCE	2.6	100	ND-0.66	ND-0.30
1,1-DCE	0.12	20	ND	ND
cis-1,2-DCE	9.1	200	ND	ND
trans-1,2-DCE	18.4	200	ND	ND
Vinyl Chloride	2.2	30	ND	ND

ND = not detected.

All values in parts per billion by volume.

# Sub-Slab Concentrations of VOCs at the Norris Elementary School (March 2005)

	<b>Sub-Slab Screening Level</b>	<b>Grab Samples</b>	<b>24-Hour Samples</b>
<b>PCE</b>	62	ND-400	ND-400
<b>TCE</b>	26	ND-160	ND-190
<b>1,1-DCE</b>	1.2	ND	ND
<b>cis-1,2-DCE</b>	91	ND-5.3	ND-5.6
<b>trans-1,2-DCE</b>	184	ND-1.7	ND-1.6
<b>Vinyl Chloride</b>	22	ND	ND

ND = not detected.

All values in parts per billion by volume.

# ATSDR/MDCH

## Conclusions & Recommendations

- VOC's in the air inside the school do not exceed screening levels.
  - Conduct additional monitoring.
- VOCs in soil gas under the school do exceed 10x the screening levels.
  - Prevent VOCs from reaching the school.

# Public Information Documents

- U.S. EPA Fact Sheet summarizing results of Norris School survey.
- MDCH & ATSDR Health Consultation
  - Public comments are welcome
  - Comment period ends September 19, 2005.

# U.S. EPA ACTIVITIES SINCE SEPTEMBER 2004

- July 2005 - ERT conducted second round of indoor air and soil gas survey at the Norris School. Preliminary results showed:
  - no indoor air concentrations exceeding action levels.
  - Sub slab soil gas detections exceeding screening levels.
  - Final sample analyses are pending.

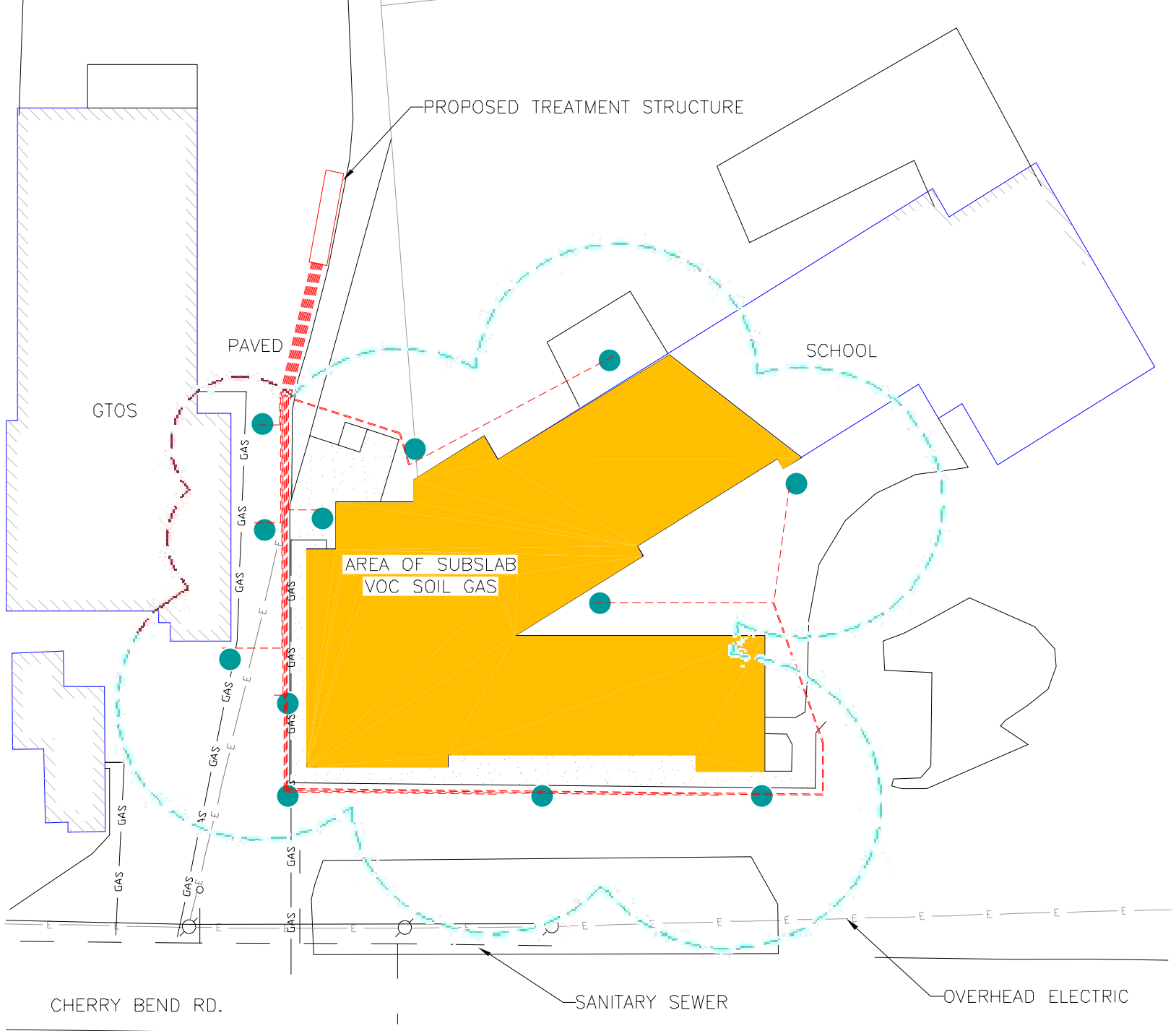


# U.S. EPA ACTIVITIES SINCE SEPTEMBER 2004

- Planning and design of engineering controls for Norris School:
  - Soil Vapor Extraction (SVE) system around and under school building.
  - SVE Pilot Test conducted on site in August 2005 to assist in final system design

# U.S. EPA ACTIVITIES SINCE SEPTEMBER 2004

- SVE system Final Design
  - series of vertical wells and one horizontal extraction well.
  - Continuously collect sub slab vapors and treat at treatment shed
  - telemetry system to notify operator of system problem/shutdown



PROPOSED TREATMENT STRUCTURE

PAVED

GTOS

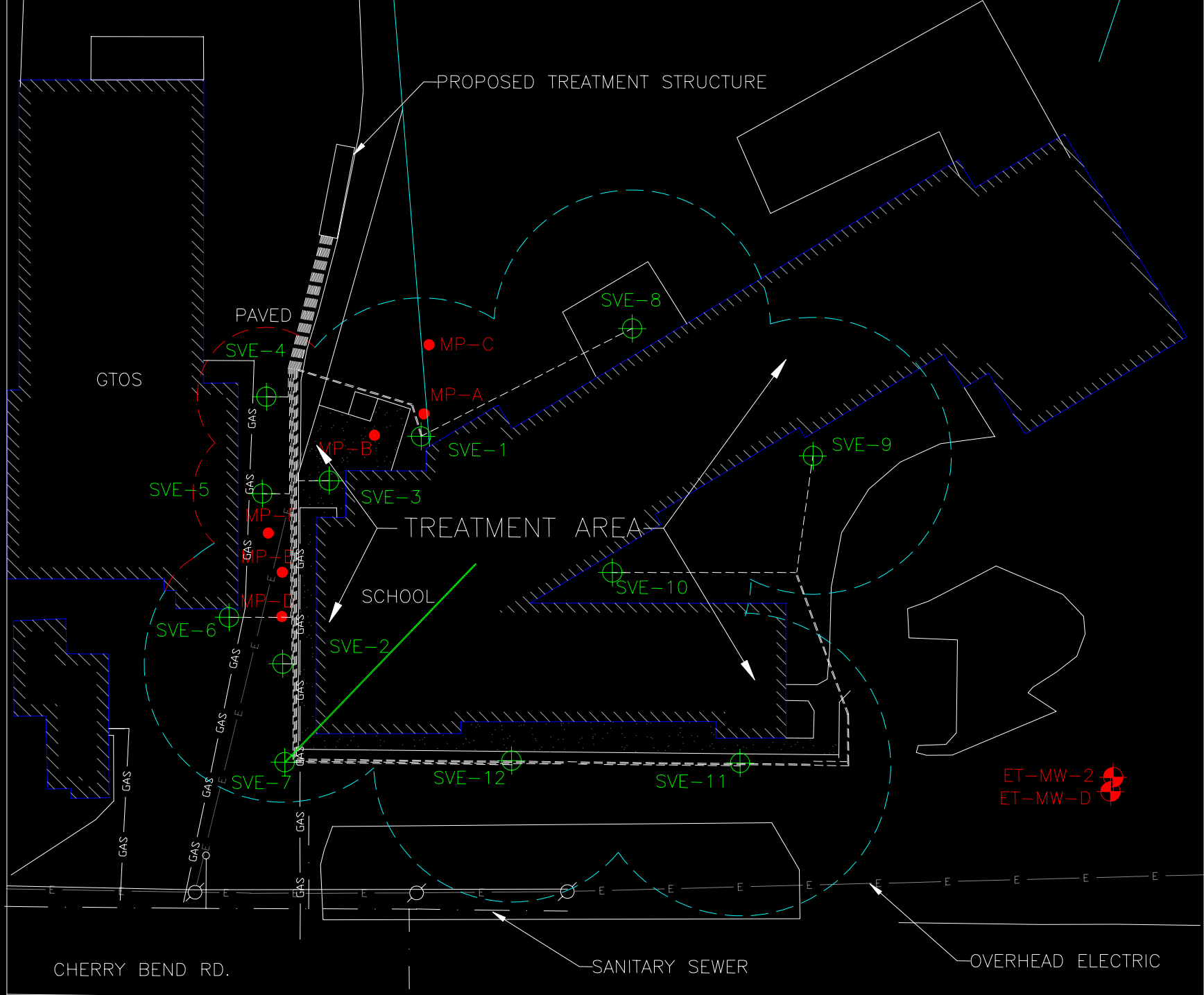
SCHOOL

AREA OF SUBSLAB  
VOC SOIL GAS

CHERRY BEND RD.

SANITARY SEWER

OVERHEAD ELECTRIC



# U.S. EPA ACTIVITIES SINCE SEPTEMBER 2004

- SVE System Installation Schedule
  - Construction planning – 3 weeks
  - SVE Well installation – 1 to 2 weeks
  - trenching and system construction – 2 to 3 weeks
  - System Startup/Shakedown – 2 to 3 weeks following completion of construction
  - System Operation and Maintenance - continuous

# U.S. EPA ACTIVITIES SINCE SEPTEMBER 2004

- SVE Pilot Test conducted on site in August 2005 to assist in final system design



# U.S. EPA ACTIVITIES SINCE SEPTEMBER 2004

- Source Area and Groundwater Investigation Activities
  - Characterization of source area contamination.
  - Further characterization of groundwater contamination downgradient of source.

# U.S. EPA ACTIVITIES SINCE SEPTEMBER 2004

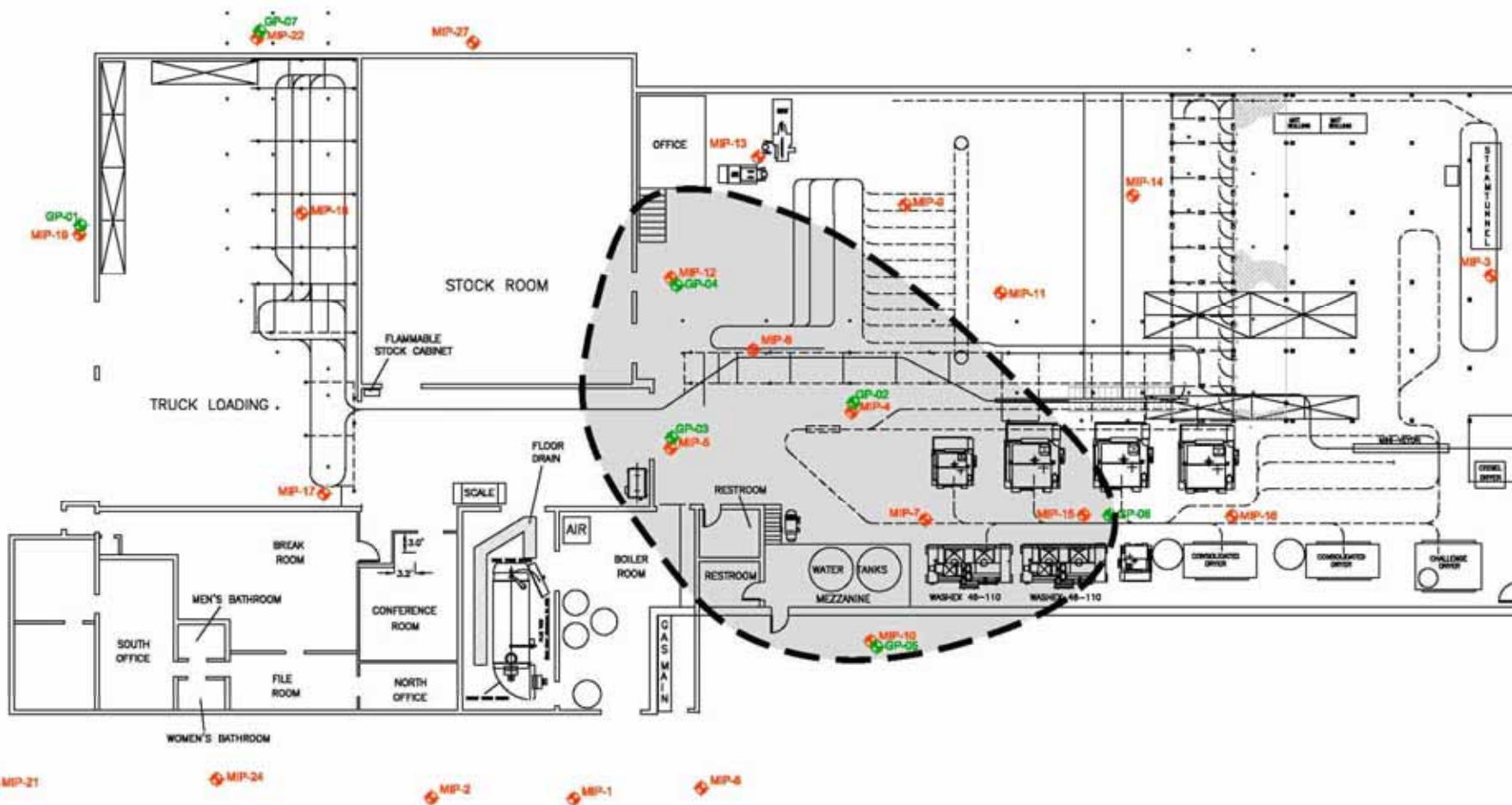
- Investigation objectives:
  - source area characterization;
  - horizontal and vertical extent of groundwater contamination;
  - Evaluate migration pathways and receptors; and
  - Prepare Report including recommendations for potential removal and/or remedial action alternatives.



# SITE INVESTIGATION PROGRESS TO DATE

- Source area investigation using Membrane Interface Probe (MIP) field screening technology – June/July 2005.

# Approximate Extent of Soil Impact

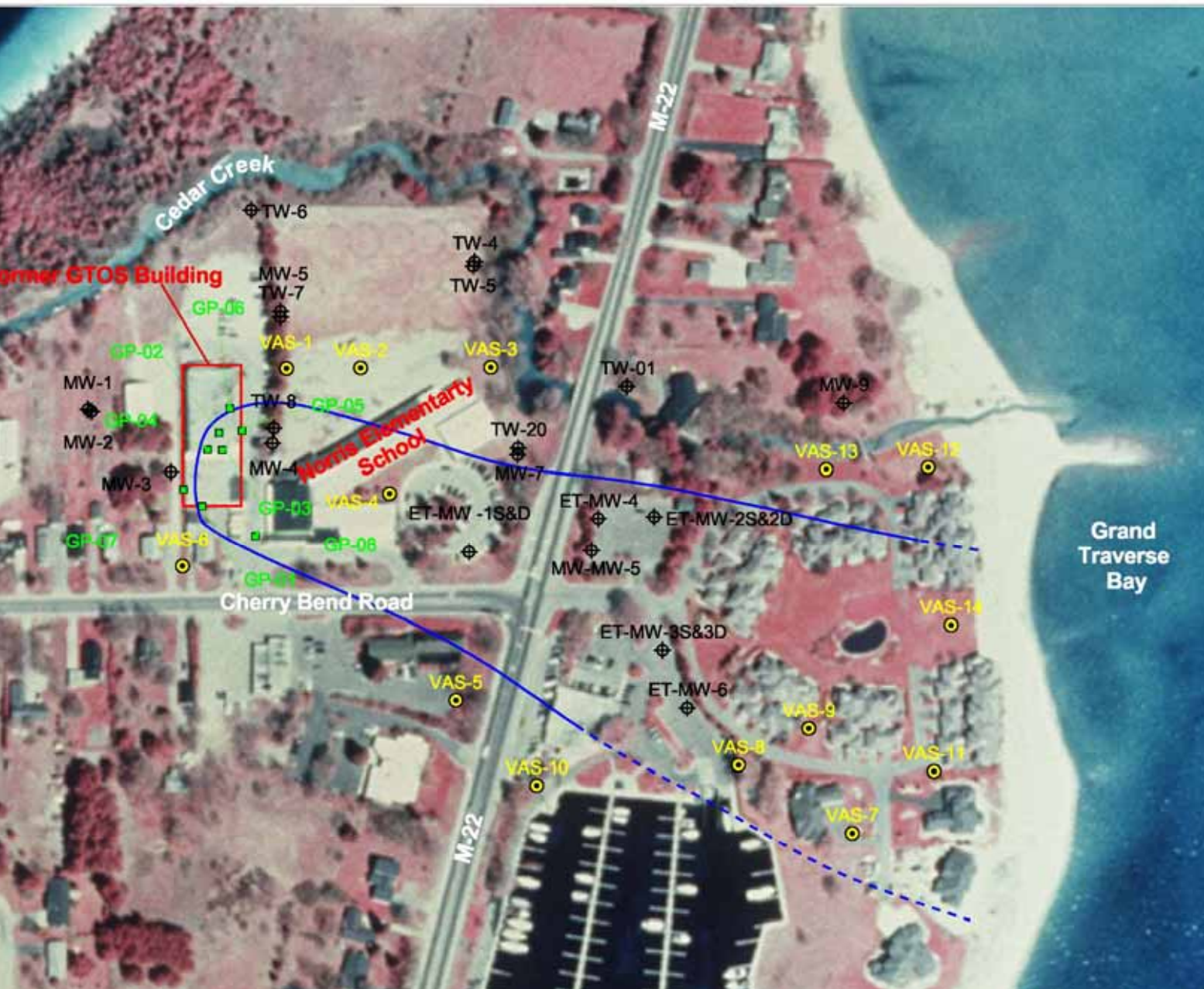




# SITE INVESTIGATION PROGRESS TO DATE

- Groundwater contamination delineation - ongoing.
- Investigation area from the former GTOS building east to the west arm of Grand Traverse Bay.

# Approximate Extent of Groundwater Contamination Plume



**LEGEND:**

- Locations
- ⊕ Existing Monitoring Wells
- ⊙ Vertical Aquifer Sampling Boring Location
- MIP Confirmation Boring
- ▭ Estimated VOC GW Plume Boundary
- ▭ Former GTOS Building

**NOTES:**  
 Base Map Source:  
 USGS Digital Orthophoto  
 Traverse City SW Quad  
 SE Quadrant  
 April 28, 1998

N

0 170 Feet



Grand Traverse Overall Supply Site  
 Grelickville, MI

Weston Solutions, Inc.  
 2501 Jolly Road, Suite 100  
 Okemos, Michigan 48864-3515  
<http://www.westonsolutions.com>

**Estimated VOC Groundwater  
 Plume Boundary**

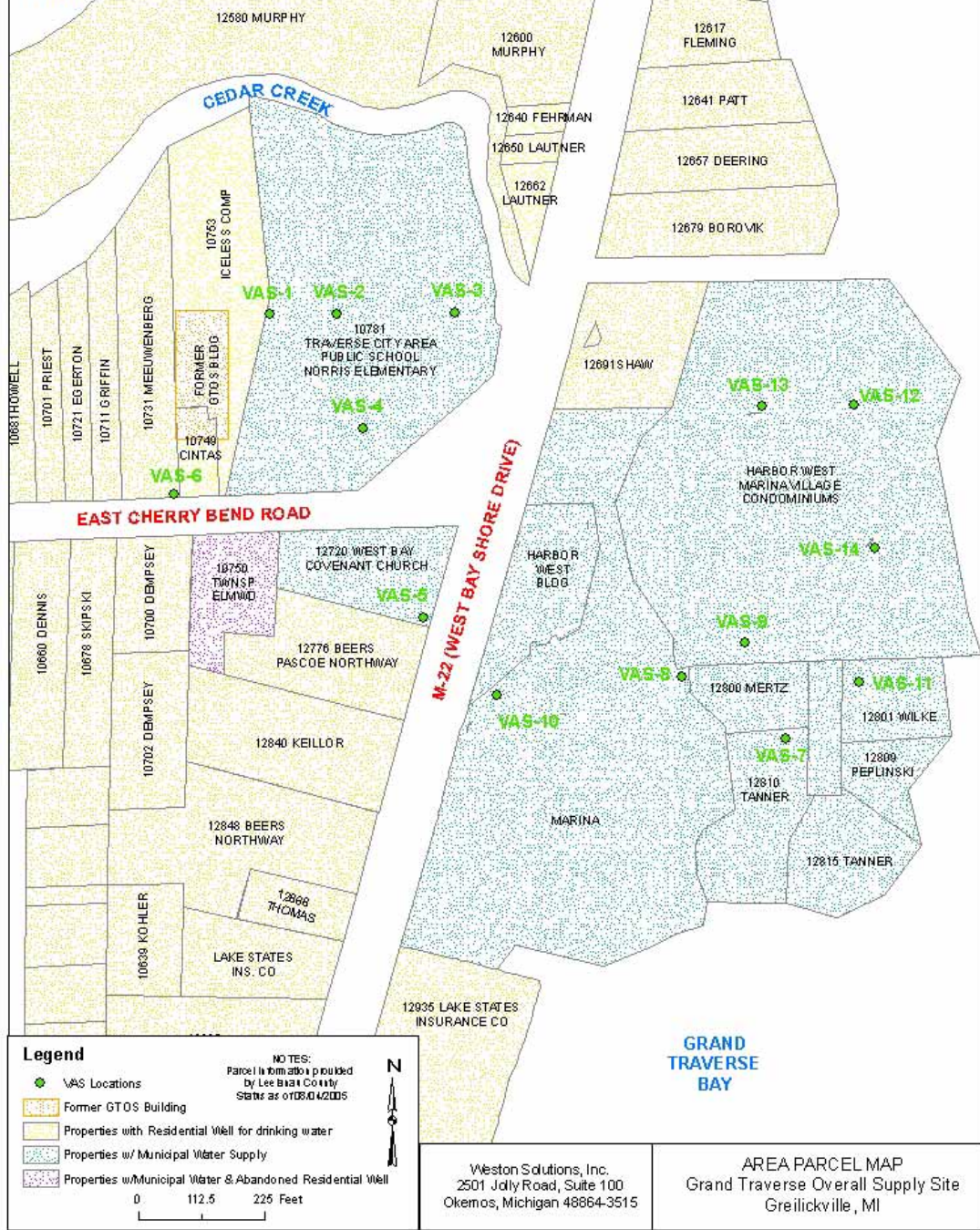
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CONTRACT:	CONTRACT:

# SITE INVESTIGATION PROGRESS TO DATE

- Remaining activities
  - Installation and sampling of permanent monitoring wells.
  - Cedar Creek surface water sampling.
  - Site Surveying.
  - Data evaluation/report preparation.

# SITE INVESTIGATION PROGRESS TO DATE

- Recent extension of Public drinking water main.
- Status of residential and commercial properties downgradient of the site that have drinking and/or irrigation wells.



Weston Solutions, Inc.  
2501 Jolly Road, Suite 100  
Okemos, Michigan 48864-3515

AREA PARCEL MAP  
Grand Traverse Overall Supply Site  
Greilickville, MI



# PLANNED ACTIVITIES IN MONTHS AHEAD AND LONG TERM

- Complete Site Investigation field activities  
- 6 to 8 weeks
- Reporting/Recommendations – 3 to 4 months
- O&M of Engineering Controls – ongoing
- Continued monitoring of indoor air and sub slab soil gas at Norris School

Questions???