# Rails to Trails Program Assessment Guidelines

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**Florida Department of Environmental Protection**
**Bureau of Waste Cleanup Workshop**
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# Points to Ponder

- History
- Acquisition Program
- CTLs
- Sampling Plan
- ASCTL
- Summary

# Occurrence of Arsenic in the Environment

- Naturally occurring (72% <0.8 mg/Kg)
- Anthropogenic
  - Industrial contribution
  - Agricultural contribution
    - Inorganic pesticides (insecticides and herbicides)
      - Arsenic trioxide
      - Lead Arsenate
      - Sodium Arsenite
    - Organic arsenical herbicides
      - DMA, MMA, MSMA, DSMA

# Arsenical Herbicides Enter the Environment Via Two Routes:

- Spills/Mismanagement
- Legal Application

# Where Applied ?

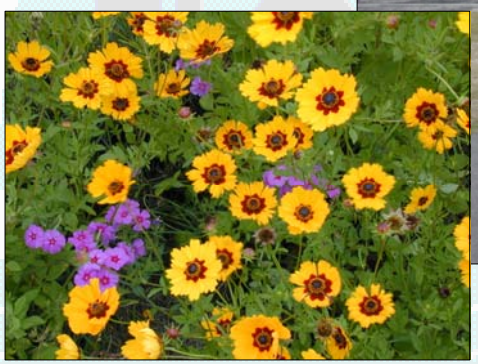
- Rail Roads
- Right of Ways
- 1,290 Golf Courses
- Cemeteries
- School Playgrounds
- Public Parks
- Sport Fields
- Sod Farms
- Electrical Substations
- Residential Homes
- Agricultural Fields

# Contributing Factors to Environmental Impacts

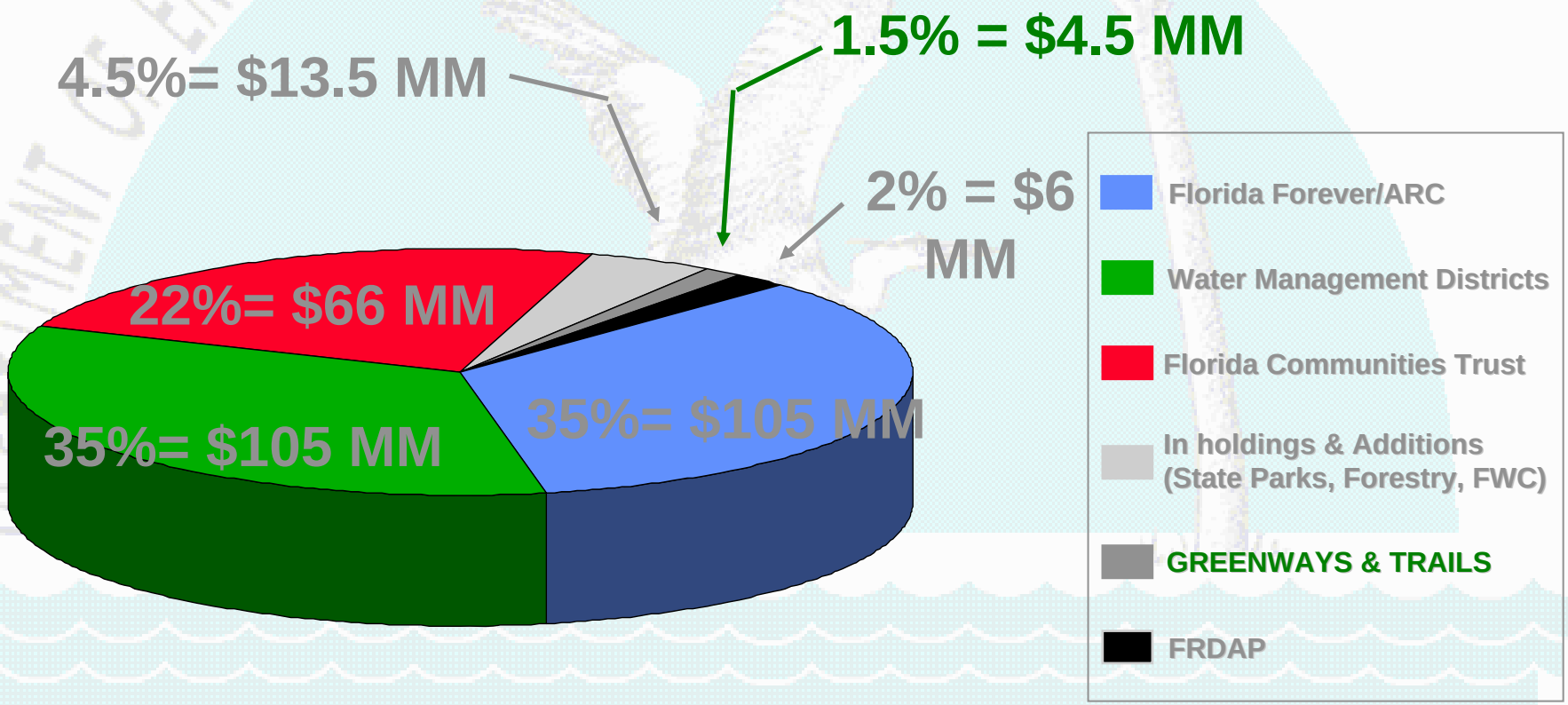
- Solubility
- Rate of application
- Frequency of application
- Soil type
- Depth to groundwater
- Soil chemistry and co-application
  - Metals (iron)
  - Phosphates
  - Chlorides and sulfates
  - Surfactants

# Florida Greenways & Trails Acquisition Program

Nature Coast State Trail
Dixie, Levy and Gilchrist counties
Purchased in 1996

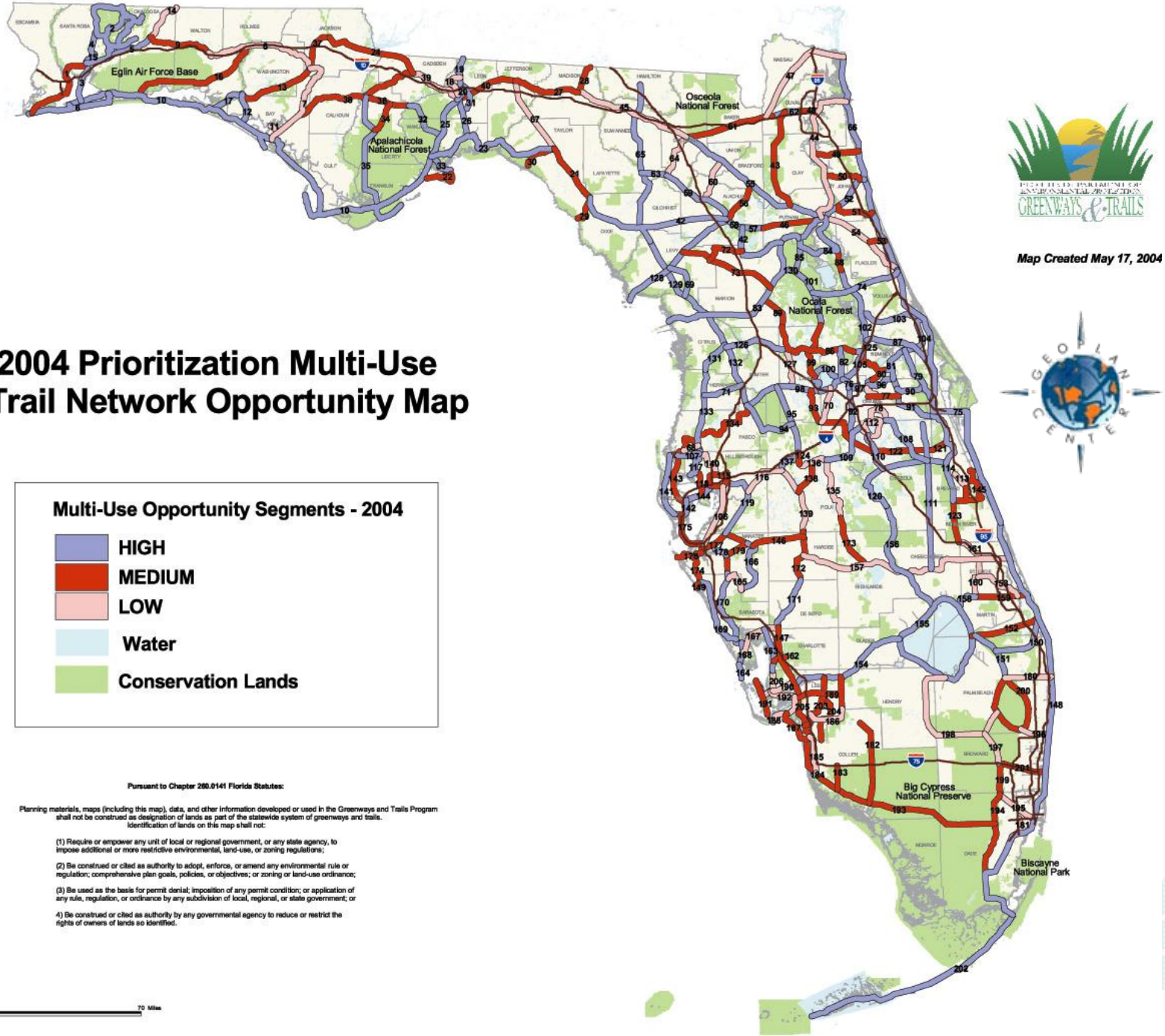


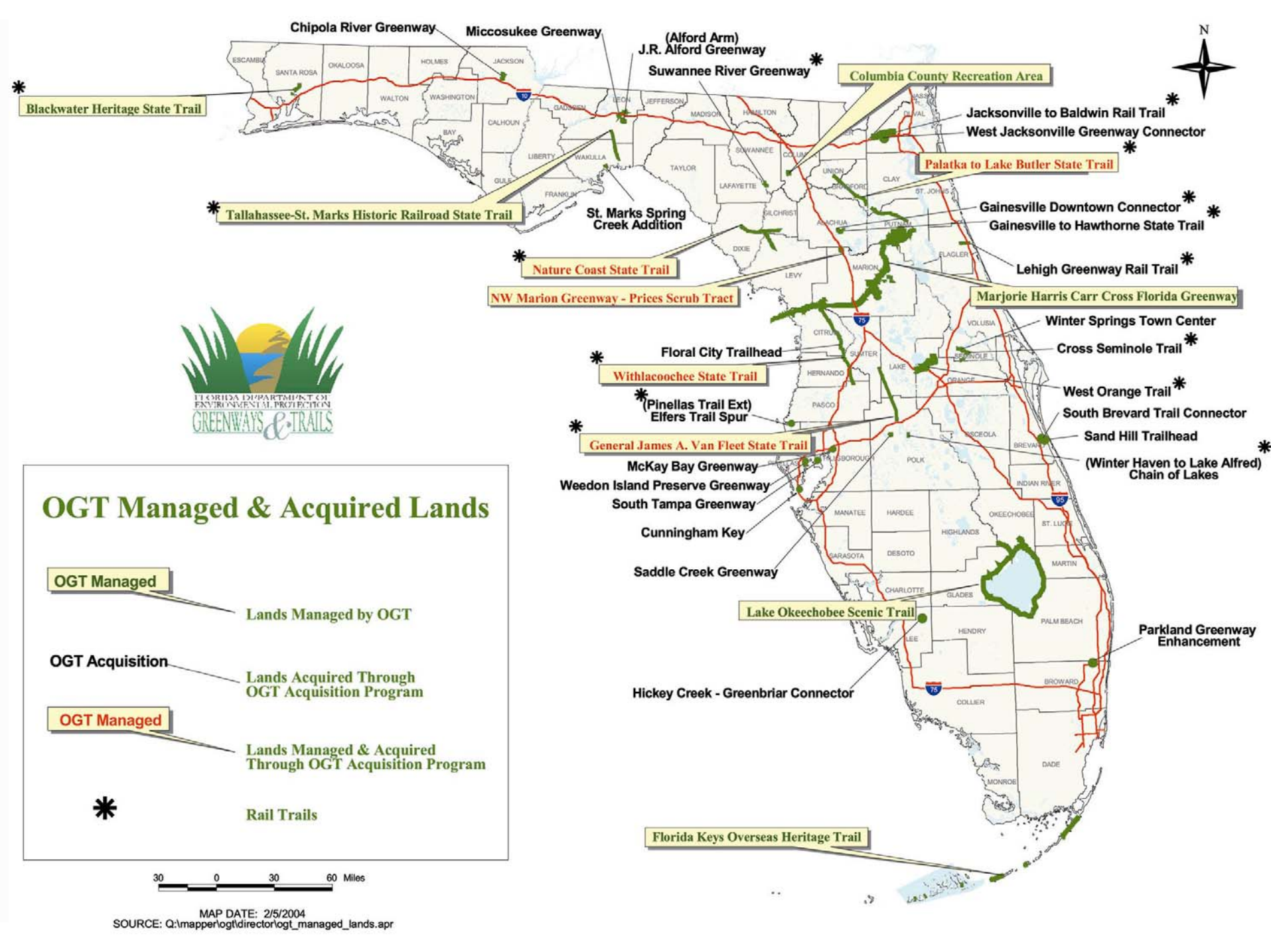
# Florida Forever Funds
# $300 Million/year



# Overview of the Acquisition Program

- To purchase land for trails, trailheads and paddling trail access points
- $4.5 million annual allocation from Florida Forever
- No match required and no cap on project funding
- Management is typically subleased to a local government or other entity for management
- **Key Point:**
  In order to be eligible, proposed lands for acquisition must lie within or adjacent to any corridor included on the Trail Network Opportunity Maps, updated in 2004.


Eglin Air Force Base
Apalachicola National Forest
Osceola National Forest
Ocala National Forest
Big Cypress National Preserve
Biscayne National Park
N
GREENWAYS & TRAILS
Map Created May 17, 2004
GEOPLAN CENTER
2004 Prioritization Multi-Use Trail Network Opportunity Map
Multi-Use Opportunity Segments - 2004
HIGH
MEDIUM
LOW
Water
Conservation Lands
Pursuant to Chapter 260.0141 Florida Statutes:
Planning materials, maps (including this map), data, and other information developed or used in the Greenways and Trails Program shall not be construed as designation of lands as part of the statewide system of greenways and trails. Identification of lands on this map shall not:
(1) Require or empower any unit of local or regional government, or any state agency, to impose additional or more restrictive environmental, land-use, or zoning regulations;
(2) Be construed or cited as authority to adopt, enforce, or amend any environmental rule or regulation; comprehensive plan goals, policies, or objectives; or zoning or land-use ordinance;
(3) Be used as the basis for permit denial; imposition of any permit condition; or application of any rule, regulation, or ordinance by any subdivision of local, regional, or state government; or
4) Be construed or cited as authority by any governmental agency to reduce or restrict the rights of owners of lands so identified.
0
70 Miles


Chipola River Greenway
Miccosukee Greenway
(Alford Arm)
J.R. Alford Greenway
Suwannee River Greenway
Columbia County Recreation Area
Blackwater Heritage State Trail
Jacksonville to Baldwin Rail Trail
West Jacksonville Greenway Connector
Palatka to Lake Butler State Trail
Tallahassee-St. Marks Historic Railroad State Trail
St. Marks Spring Creek Addition
Gainesville Downtown Connector
Gainesville to Hawthorne State Trail
Nature Coast State Trail
Lehigh Greenway Rail Trail
NW Marion Greenway - Prices Scrub Tract
Marjorie Harris Carr Cross Florida Greenway
Winter Springs Town Center
Floral City Trailhead
Cross Seminole Trail
Withlacoochee State Trail
West Orange Trail
(Pinellas Trail Ext)
Elfers Trail Spur
South Brevard Trail Connector
General James A. Van Fleet State Trail
Sand Hill Trailhead
(Winter Haven to Lake Alfred)
Chain of Lakes
McKay Bay Greenway
Weedon Island Preserve Greenway
South Tampa Greenway
Cunningham Key
Saddle Creek Greenway
Lake Okeechobee Scenic Trail
Parkland Greenway
Enhancement
Hickey Creek - Greenbriar Connector
Florida Keys Overseas Heritage Trail
N
FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
GREENWAYS & TRAILS
OGT Managed & Acquired Lands
OGT Managed
Lands Managed by OGT
OGT Acquisition
Lands Acquired Through OGT Acquisition Program
OGT Managed
Lands Managed & Acquired Through OGT Acquisition Program
Rail Trails
30 0 30 60 Miles
MAP DATE: 2/5/2004
SOURCE: Q:\mapper\ogt\director\ogt_managed_lands.apr

# FDEP Regulatory Criteria

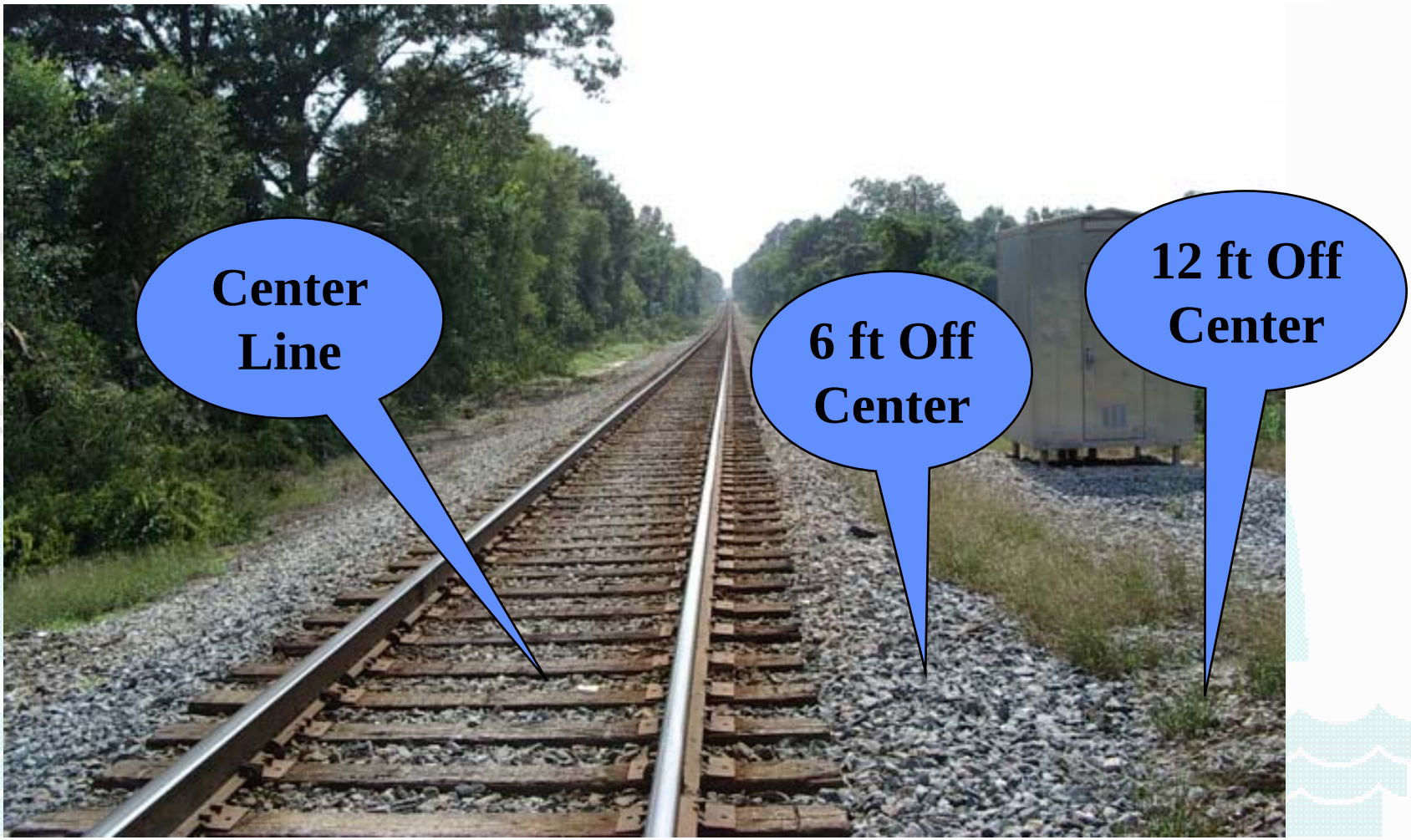
- Soil Cleanup Target Levels 2.1 mg/kg (residential)
  12 mg/Kg (industrial)

- Leachability SCTL SPLP analysis (EPA method 1312)
- TCLP 5.0 mg/L
- MCL 10 µg/L

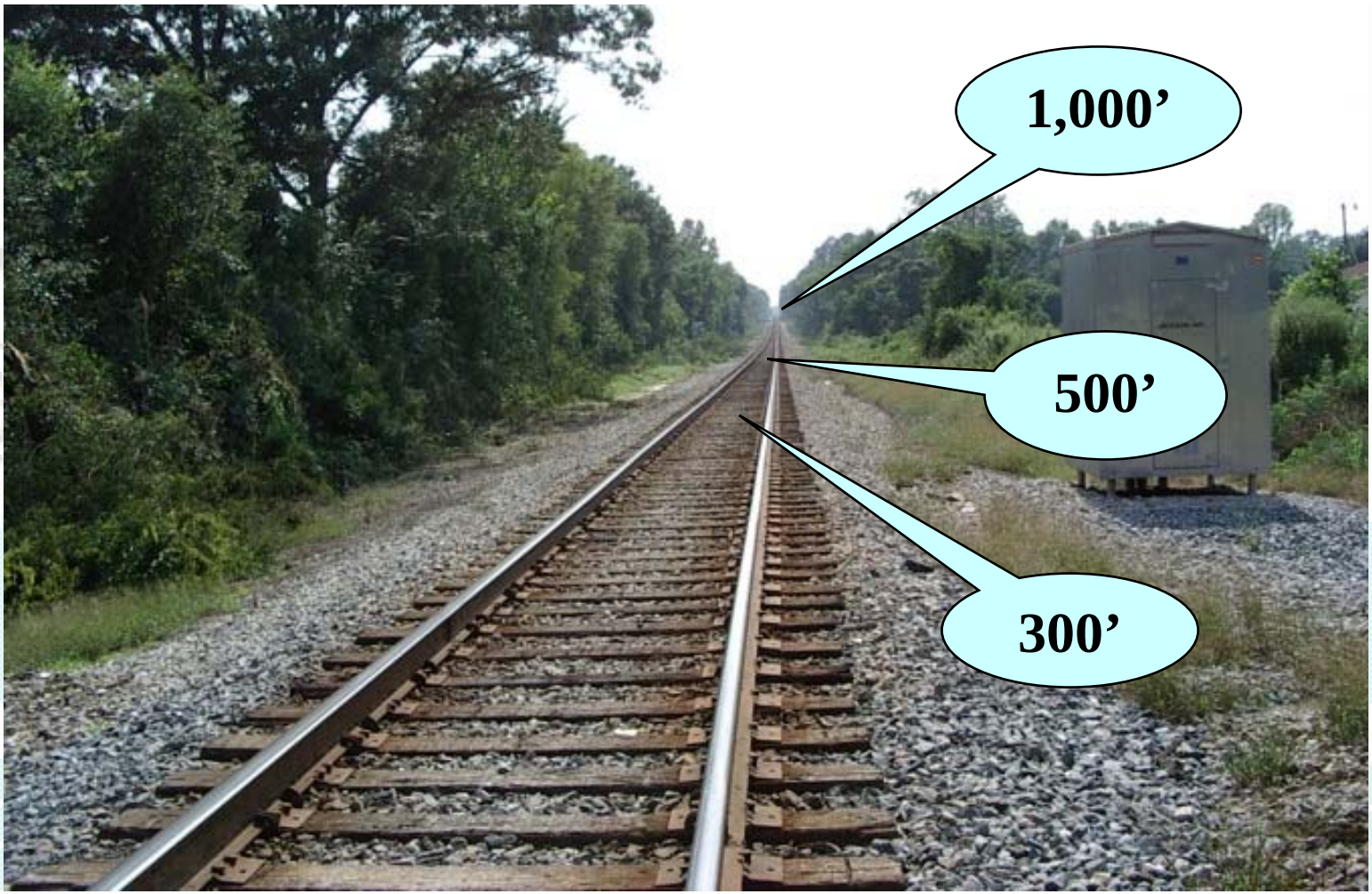
# Sampling Plan

- Depends on location and neighbors (land use)
  - residential
  - Industrial
  - recreational

# Sampling Locations



# Longitudinal Assessment

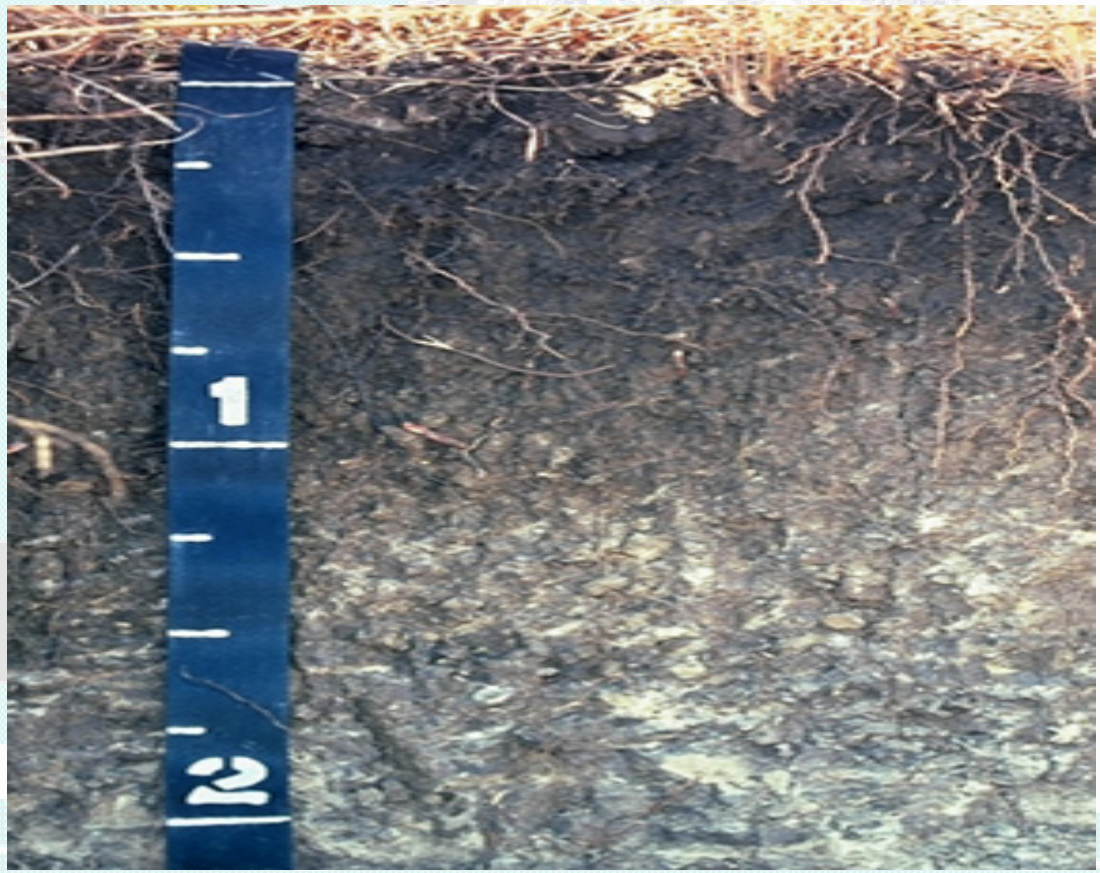


# Vertical Assessment

O - 6”

6” – 2’

2’ -4’ and so on



# Range of Arsenic Concentrations (mg/kg) in Surface Soils at two Rail Corridors in Florida

| Rail Corridor | Total Arsenic (mg/kg) |
|---|---|
| Gainesville | ND - 183 |
| Lake Alfred – Winter Haven | ND - 121 |

# Provisional Rail Scenario, Arsenic

$$SCTL = \frac{(TR*BW*AT)}{(EF*ED*FC) * [(CSFo*IRo*TR) + ((CSFd)*SA*AF*DA*TR) + ((CSFi)*IRi*((1/100000000000)+(1/PEF)))]}$$

- **Inputs:**
- **TR=1.00E-06 (unitless)**
- **BW=39 (kg)**
- **AT=25550 (days)**
- **EF=200 (days/year)**
- **ED=14 (years)**
- **FC=1 (unitless)**
- **CSFo=1.5 (mg/kg/day)-1**
- **CSFd=1.579 (mg/kg/day)-1**
- **CSFi=1.505 (mg/kg/day)-1**
- **RBA=0.33 (unitless)**
- **SA=4200 (cm2)**
- **AF=0.11 (mg/cm2)**
- **DA=0.001 (unitless)**
- **IRo=129 (mg/day)**
- **IRi=12.2 (m3/day)**
- **PEF=1.24E+09 (m3/day)**

**= 5.5. mg/kg**


SPEED
LIMIT
20
STOP
KEEP
LEFT RIGHT
4-WAY

# Application Rate

- 20 year application (twice a month) could results in soil concentration of 35 – 100 mg/Kg

# Data Conclusions

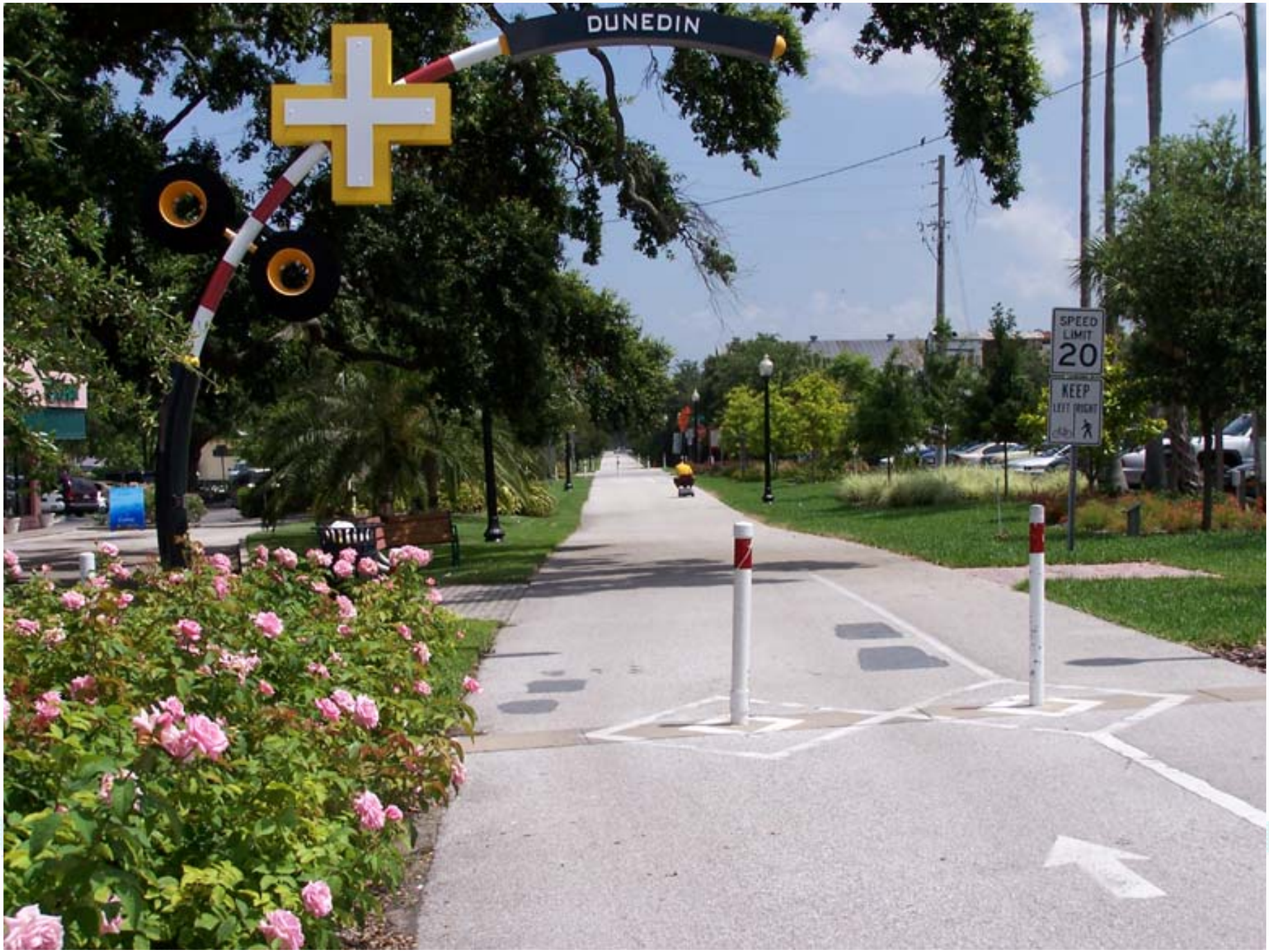
- Soils show Arsenic levels above the SCTLs.
- The lower MCL for arsenic in groundwater could show violation in future assessments.
- Other COCs:  PAHs, Dioxin, Lead???

# ECs/ICs

Asphalt Caps

Shrubs

Management Plans


DUNEDIN
SPEED LIMIT 20
KEEP LEFT RIGHT


The Pinellas
Trail


TIME OUT CAFE
ERIKA'S PLACE
714 BROADWAY
TREEHOUSE GARDEN
COLLECTION
Sea Sea Riders
Restaurant
CASA TINA
GOURMET MEXICAN &
VEGETARIAN CUISINE
CHOCOLATE FACTORY
2 BLOCKS
Firehouse Gallery
Get Ignited!

# Revitalization

# Summary

- All trails assessed to date show soil contamination with arsenic.
- Continuous application of arsenical-based pesticides in active rail corridors is a potential threat to groundwater.
- Lowered arsenic MCL needs a closer evaluation of concentrations of arsenic in soil for Leaching Potential (develop site-specific Leachability-SCTL).

# Acknowledgements

Jim Wood
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