Maryland
Department of the Environment

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

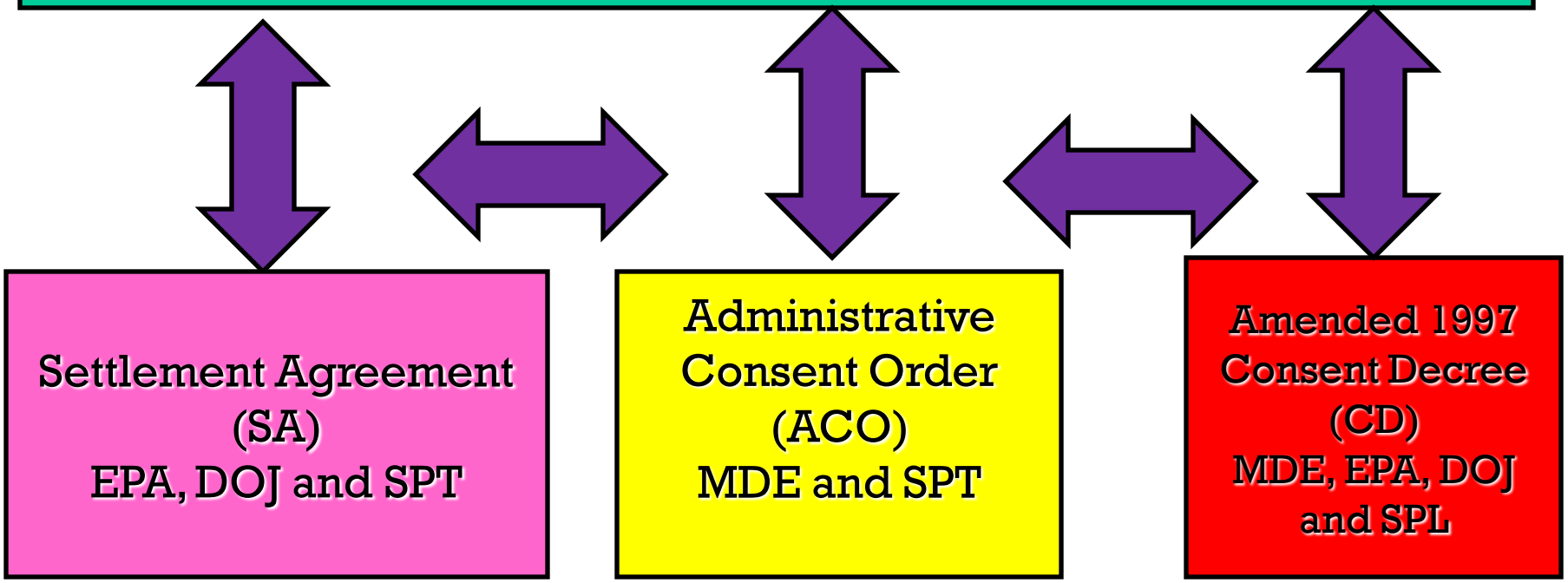
Public Informational Meeting on the Former Sparrows Point Steel Mill Environmental Cleanup

April 21, 2016

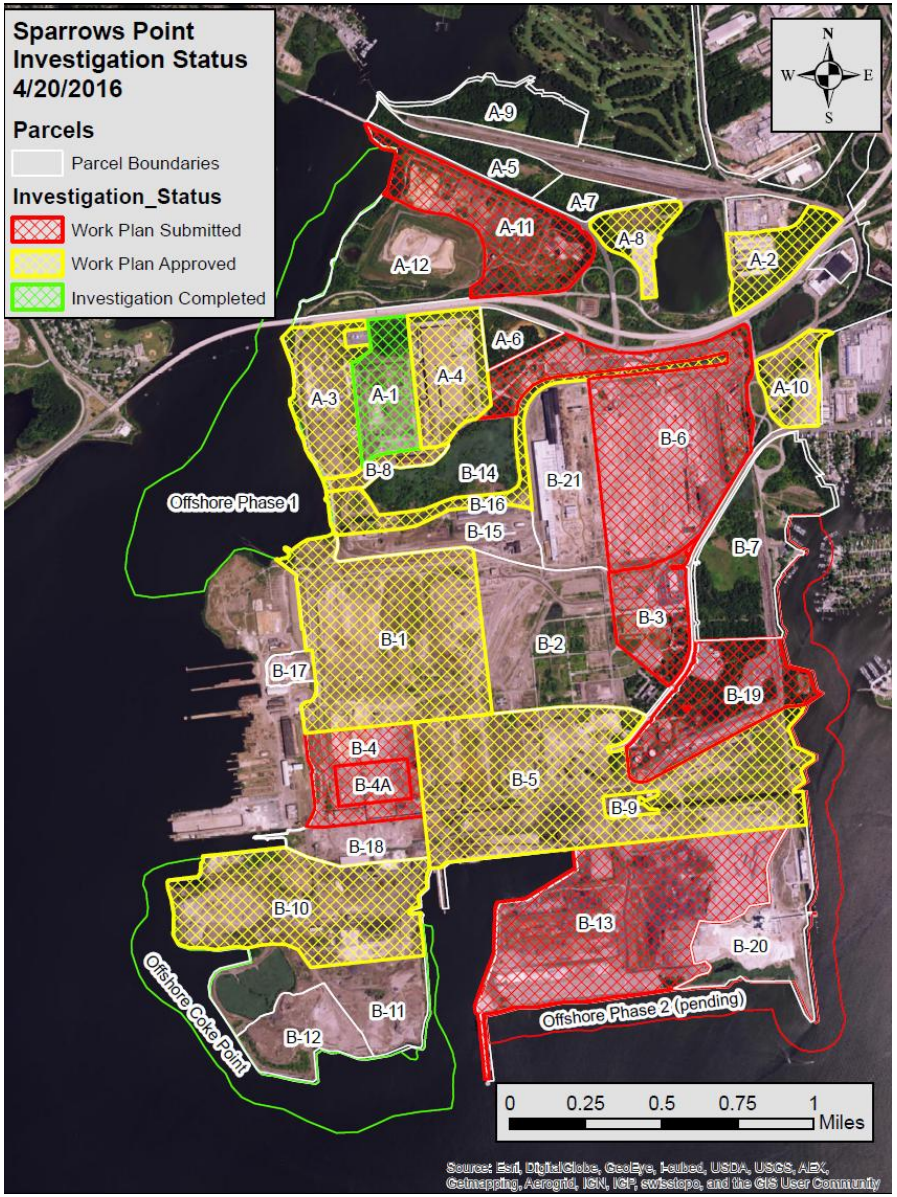
Environmental Work On the Entire Site For MDE and EPA

MDE will assume primary responsibility for overseeing implementation of the onshore work in consultation and cooperation with EPA

EPA will assume primary responsibility for implementation of the offshore work in consultation and cooperation with MDE



Site Investigation Status



Since QAPP Approval September 2015
as of April 2016

Soil Borings Installed: 582

Temporary Monitoring Wells Installed: 39

Permanent Ground Water Monitoring Wells Installed: 76

Soil Gas Points Installed: 48

Phase II Reports currently being prepared upon receipt of validated lab results

*Work plans and reports posted on MDE Website

Parcel A-1 RAP Progress

Surcharging Process recently completed
Excess clean soil to be relocated prior to building construction

Demolition Progress

Pit 45 Prior to Cleaning

Pit 45 After Cleaning

Photo Credit Mike Cirri Jenkins Environmental Inc

Coke Oven Area Interim Measures

Former Coke Oven Area
Sparrows Point Terminal, LLC

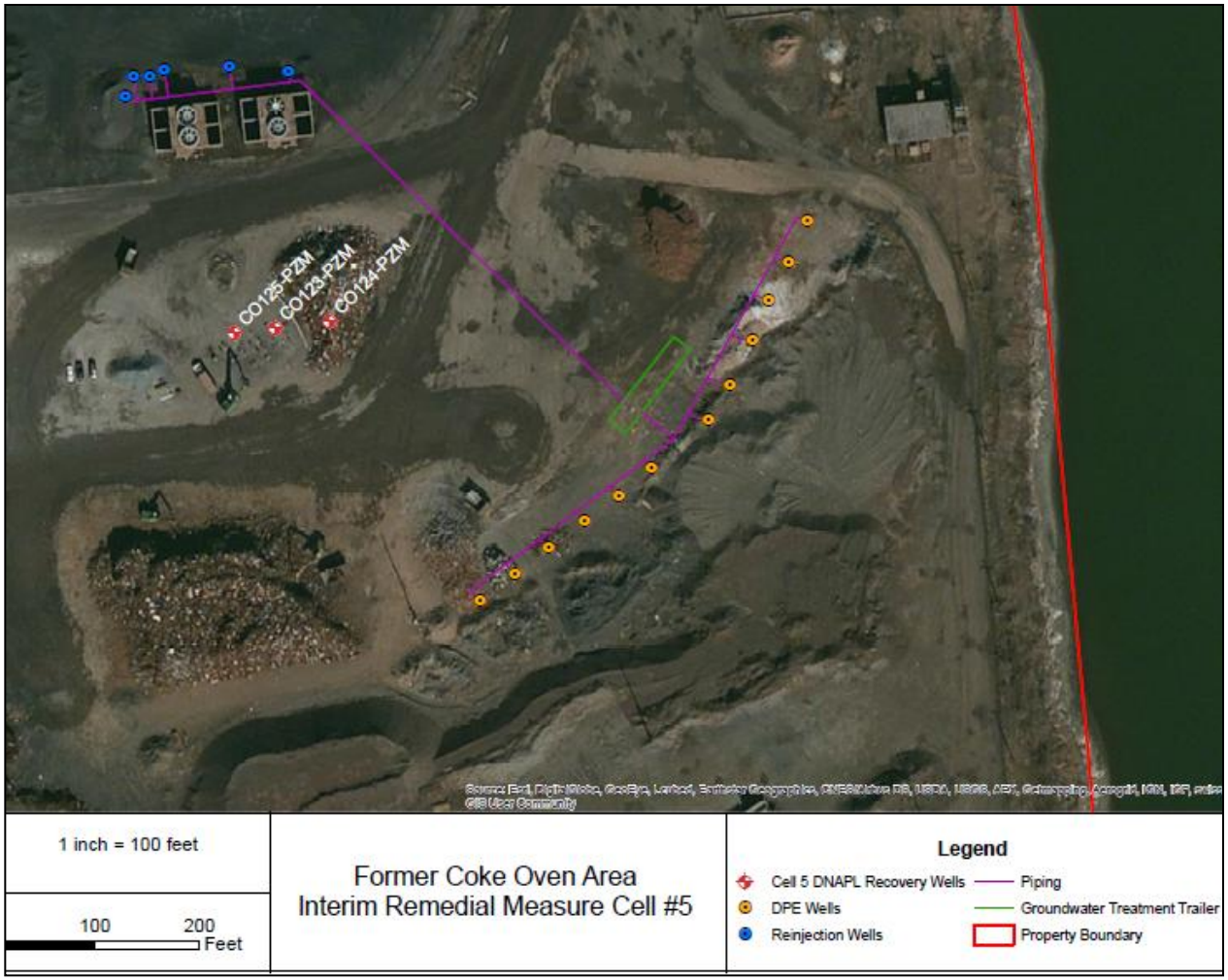
Coke Oven Interim Measures Upgrades-Cell 1

Cell 1 Piping System Completely Replaced and New Sparge Wells Added

Coke Oven Interim Measures Upgrades-Cell 1

Cell 1 Upgraded Flow Control System

Coke Oven Interim Measures Upgrades-Cell 5



DNAPL product removal began to be extracted from the Cell 5 area in the latter part of the 4th quarter 2015.

DNAPL was extracted from several newly constructed extraction wells that have constructed DNAPL sumps below the screened interval.

As of April 2016 245 gallons of DNAPL recovered with 145 gallons from CO123-PZM and 100 gallons from CO125-PZM

Coke Oven Interim Measures Planned Upgrade-Cell 6

Will utilize 42 extraction wells for Bio-Slurp system

High vacuum extraction to remove vapor and product

Vapor will be collected and treated

Liquid into oil/water separator

Recovered ground water will be filtered and reinjected to maintain ground water levels to facilitate continued product recovery

For Additional Information From EPA On Shore Activities :

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U.S. Environmental Protection Agency Region 3
Mail Stop: 3LC20
1650 Arch Street
Philadelphia, PA 19103-2029
(215) 814-3426
fan.andrew@epa.gov

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For Additional Information From EPA On Off-Shore Activities :

Gregory Ham
On Scene Coordinator
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Office of Preparedness and Response
Hazardous Site Cleanup Division
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Fort Meade, MD 20755
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Ham.Greg@epa.gov

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For Additional Information From MDE

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Land Management Administration
Maryland Department of the Environment
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Baltimore, Maryland 21230
(410) 537-3493
Barbara.brown1@maryland.gov

Visit the MDE Website!

http://www.mde.maryland.gov

Sparrows Point Phase I Offshore Investigation Report

Summary presented by MDE and EPA Region III, April 2016

Sparrows Point Environmental Trust

- Established in 2014
- To investigate offshore areas for waste/chemicals released from the now demolished steel facility
- Excludes Coke Point offshore area
- The Trust contracted EA Engineering, Science and Technology

Phase I Offshore Investigation Area – Bear Creek

Offshore Investigation Process

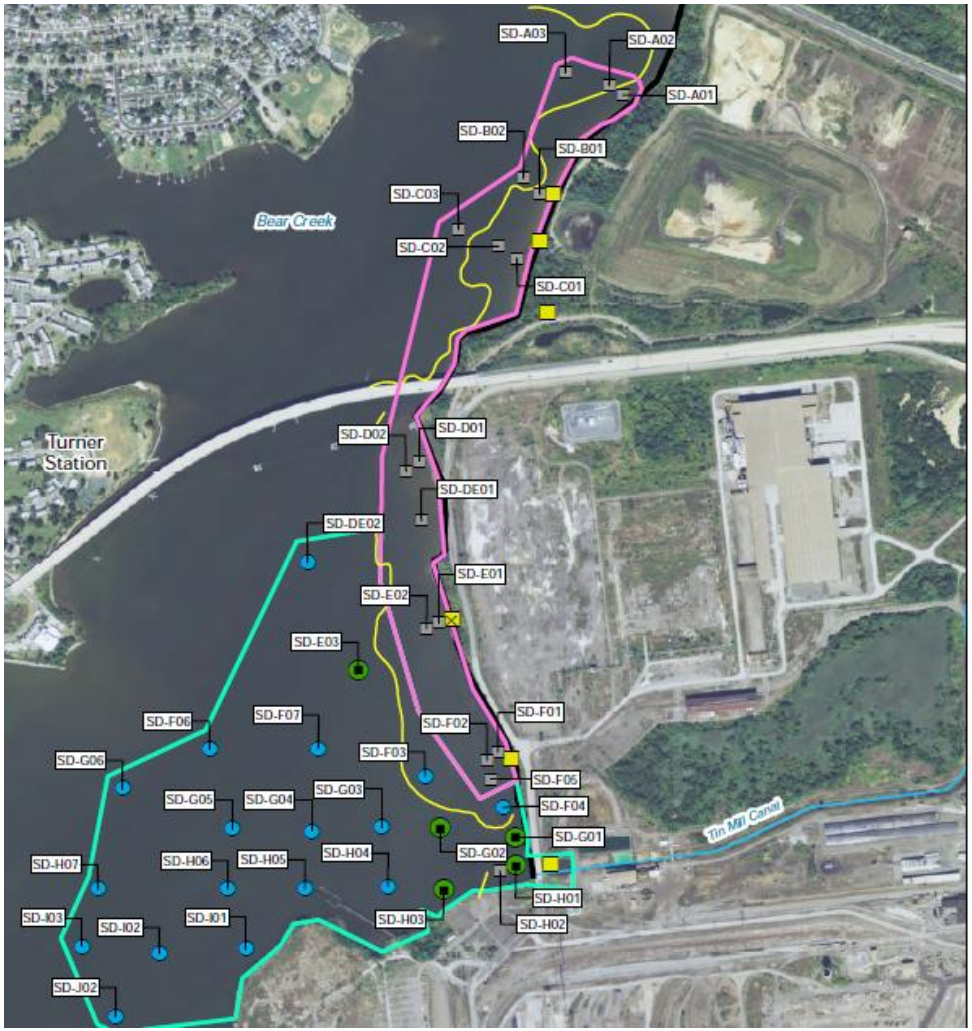
- Collected Bear Creek surface sediment and pore water samples, and Site stormwater samples
- Samples analyzed for Site-related chemicals found in groundwater or all potential stormwater chemicals
- Collected follow-up sediment cores
- Results evaluated in human health and ecological risk assessments

All Sampling Locations

Two Data Groups:

Northeast/Near Shore (NNS) – coarse sediment, little contamination

Southwest/Tin Mill Canal (SWTM) – silty, contaminated sediment



Results

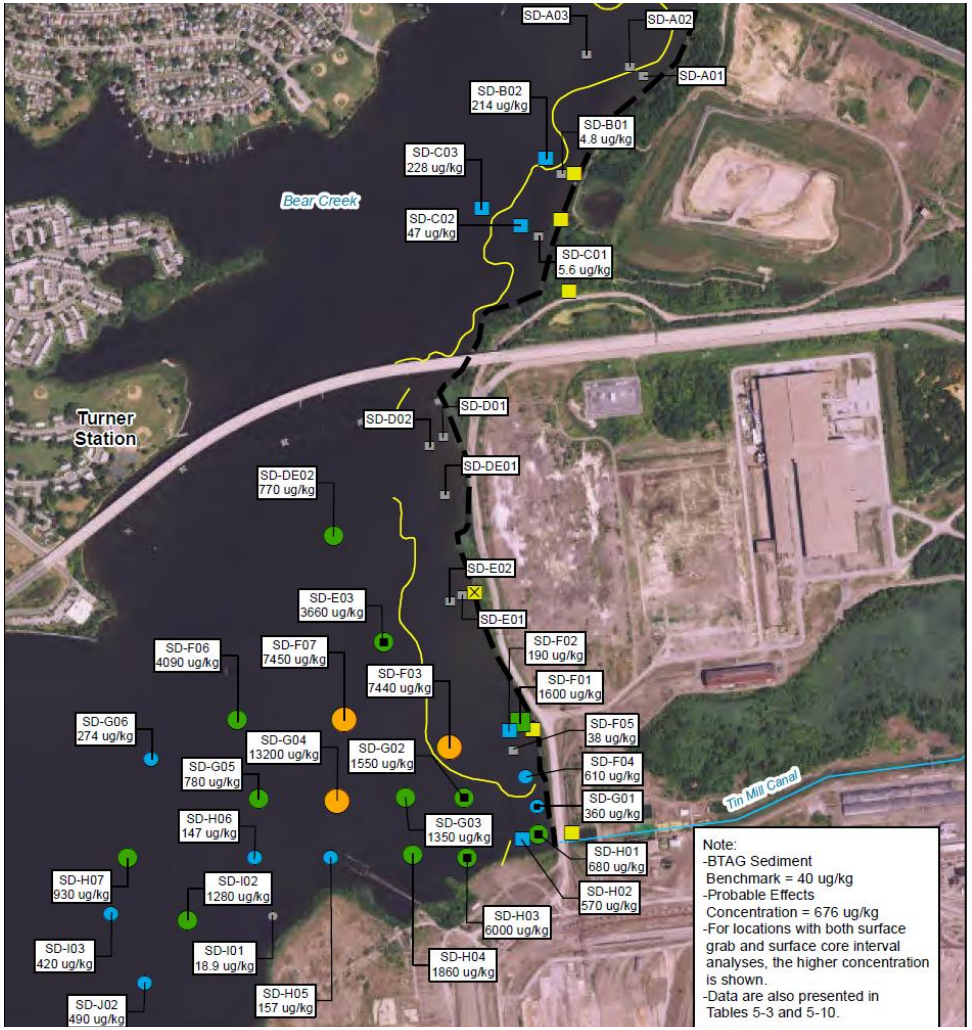
- Metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and bis(2-ethylhexyl)phthalate were detected in both NNS and SWTM surface sediment
- SWTM silty sediments had greater concentrations of all chemicals plus high oil and grease near Tin Mill Canal outfall
- SWTM sediment core samples similar to surface samples

Results

- Pore water samples contained primarily elevated cyanide
- Site stormwater samples contained no elevated chemicals except cyanide

Example: PCB Sediment Distribution

PCBs, select metals, and oil and grease in sediment appear linked to the Tin Mill Canal outfall

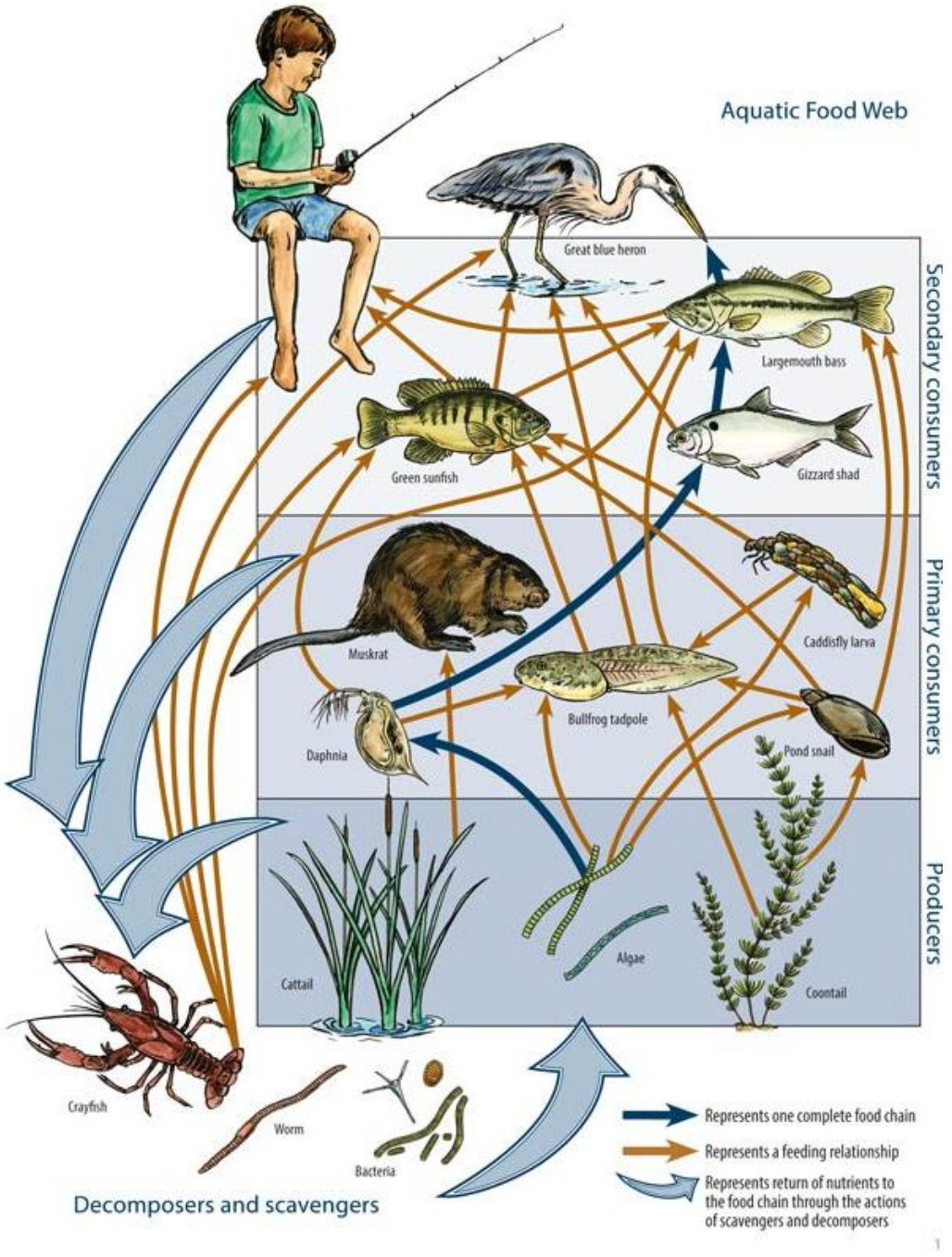


Data Used for the Risk Assessments

- Bear Creek surface sediment data collected in investigation
- Surface water modeled from the stormwater data collected in investigation
- Chemical analysis results for fish and crab caught from offshore Coke Point and Sollers Point (EA, 2011)
- Estimates of fish and crab chemical concentrations from the investigation's sediment and surface water data

Offshore Ecological Risk Assessment

- Aquatic (fish) and benthic (worms, mollusks) organisms
- Wildlife foraging on aquatic and benthic organisms



Offshore Ecological Risk Assessment Process

- Surface sediment and modeled surface water chemical concentrations compared to criteria to protect aquatic and benthic organisms

- Exposure to wildlife (raccoon and great blue heron) foraging on aquatic/benthic organisms estimated by food chain modeling from sediment/surface water chemicals

NNS Ecological Risk Assessment Results

- NNS assessment evaluated sediment/surface water chemicals identified in current groundwater and stormwater
- Sediment chromium and zinc, and cyanide in storm event surface water may pose risk to aquatic/benthic organisms
- No excess risk identified for wildlife via food chain modeling

SWTM Ecological Risk Assessment Results

- SWTM assessment evaluated all chemicals analyzed, based on the Tin Mill Canal source
- Sediment metals (cadmium, chromium, copper, lead, nickel, silver, zinc), PAHs, PCBs, bis(2-ethylhexyl)phthalate, oil and grease, and cyanide in storm event surface water likely pose risk to aquatic/benthic organisms
- Food chain modeling identified excess risk to wildlife due to PCBs and selenium

Human Health Risk Assessment Process

- Evaluated potential recreational users and commercial fishermen for the Phase I offshore area
- Recreating adults, adolescents, and children were assumed to swim 4 days/year and consume 32 fish/crab meals/year (2 days fishing/week in season)
- This consumption rate exceeds MDE fish consumption advisories for Baltimore Harbor
- Fishermen were assumed to work 39 days/year in offshore area, consuming 39 fish/crab meals/year

Human Health Risk Assessment Process

- Calculations combine exposure assumptions and investigation data to estimate chemical intake
- Chemical intake of recreators/fishermen is compared to toxicity criteria to estimate risk and hazard
- EPA's acceptable excess cancer risk range is 1×10^{-6} to 1×10^{-4}
- MDE's acceptable excess cancer risk range is

  1×10^{-6} to 1×10^{-5}

Human Health Risk Assessment Results

- NNS assessment evaluated sediment/surface water chemicals identified in current groundwater and stormwater
- No unacceptable risk was identified for the swimming and field-collected fish/crab consumption assumptions
- Modeled fish/crab over-predicted chemical concentrations, exceeding MDE's acceptable cancer risk range for consumption

Human Health Risk Assessment Results

- SWTM assessment evaluated all chemicals analyzed, based on the Tin Mill Canal source
- Swimming and field-collected fish/crab consumption assumptions resulted in no unacceptable risk using EPA's cancer risk range, but exceeded MDE's more conservative risk range for consumption

Human Health Risk Assessment Results

- The SWTM consumption assumptions exceeded MDE's fish consumption advisories for Baltimore Harbor
- SWTM modeled fish/crab greatly over-predicted chemical concentrations, exceeding EPA and MDE's acceptable cancer risk range and hazard

In Conclusion

- Potential ecological risk was found in the SWTM area due to sediment contaminants

- The investigation results will be evaluated in an Engineering Evaluation/Cost Analysis managed by Greg Ham, On-Scene Coordinator, Hazardous Site Cleanup Division EPA Region III

Sparrows Point Offshore Sediments

April 21, 2016

Gregory Ham
On Scene Coordinator

- Office of Preparedness and Response
  - Hazardous Site Cleanup Division

Sparrows Point Offshore Contamination

- Superfund program (CERCLA) has taken on the offshore work as it has the authority to manage the funds set aside by the Settlement Agreement.
- Some funding by Settlement Agreement for investigation, cleanup, and oversight
- Continuing to coordinate with the Maryland Department of the Environment

Removal Process (Non-time Critical)

- Assessment of site
- Engineering Evaluation/Cost Analysis
  - Public Participation
- Action Memorandum
  - Identifies problem, describes work to be done, sets cost ceiling
  - Authority to do work

Engineering Evaluation/Cost Analysis

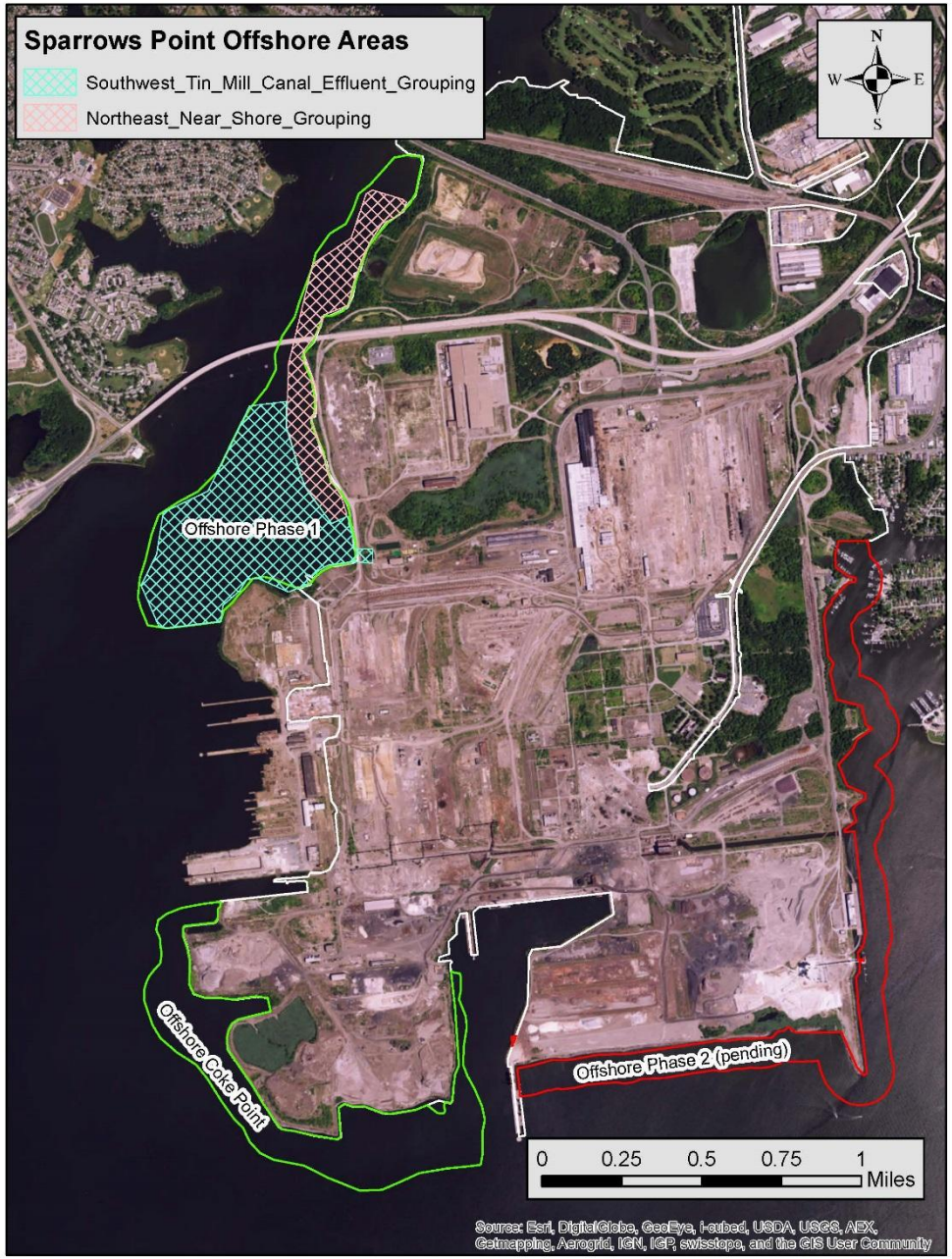
- Site Characterization
- Identification of Removal Action Objectives
- Identification and Analysis of Removal Action Alternatives
- Comparative Analysis of Removal Alternatives
- Recommended Removal Action Alternative

Public Participation

- Administrative Record File established
- Notice of Availability
- 30-day public comment period
- Written response to significant comments
- Community Involvement Plan

Offshore Areas

- Northwest area (Phase 1)
- Southeast Area (Phase 2)
- Coke Point


Sparrows Point Offshore Areas
Southwest_Tin_Mill_Canal_Effluent_Grouping
Northeast_Near_Shore_Grouping
N
W
E
S
Offshore Phase 1
Offshore Coke Point
Offshore Phase 2 (pending)
0
0.25
0.5
0.75
1
Miles
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

North West Area

- Assessment completed
- Engineering Evaluation/Cost Analysis (EE/CA) being initiated using an EPA contractor (EA Eng., Science and Technology).
- Estimated completion end of CY 2016
- EE/CA will evaluate cleanup options/costs

North West Area – Bear Creek

Oily Sediments

South East Area

- No recent sampling data
- Assessment work plan being finalized
- First Round Sampling May 2016 (tentative)
  - 13 transects, 39 sampling locations for surface sediments
  - Stormwater samples from 7 outfalls
- Second round planned late summer/fall
  - Core sampling

Legend

- Proposed Sediment Sample Location
- Approximate Location of Active Stormwater Outfall

Imagery: ESRI, Bing Mapping Service

Coordinate System: WGS84 UTM Zone 18N Feet

0 1,350

Feet

Sparrows Point Sediment Assessment
Baltimore, Baltimore County, Maryland

Figure 3
Sediment Sample Locations

TDDA W501-15-DE-0005
Contract: EP-S5-15-02
Prepared: 4/19/2016

WESTON SOLUTIONS

File: Y:\EPA_Region_III\Sparrows_Point\MXD\Prop_Sed_locs.mxd, 4/19/2016 9:39:40 AM, rickse

Coke Point Area

- Considered for Dredge Disposal Area by Maryland Port Administration
- Investigation completed
- Awaiting decision
- If MPA does not develop, offshore area will need to be addressed

Questions?