# FORMER HARSHAW CHEMICAL SITE PROJECT UPDATE

**Formerly Utilized Sites**

**Remedial Action Program**

Cleveland, Ohio

January 20, 2010

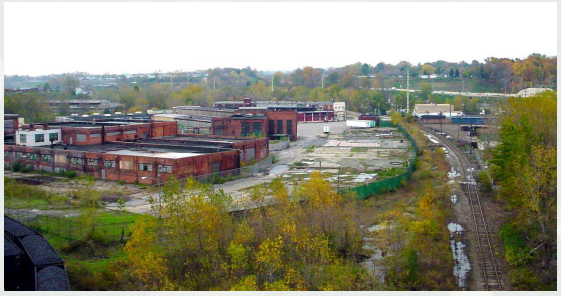


US Army Corps of Engineers
BUILDING STRONG®

- Slides and Notes: Revision 3 Meeting Final
- Author: SAIC
- Date: 1/20/10

# AGENDA

- Project Introduction
- Remedial Investigation Summary
- Next Steps
- Project Schedule



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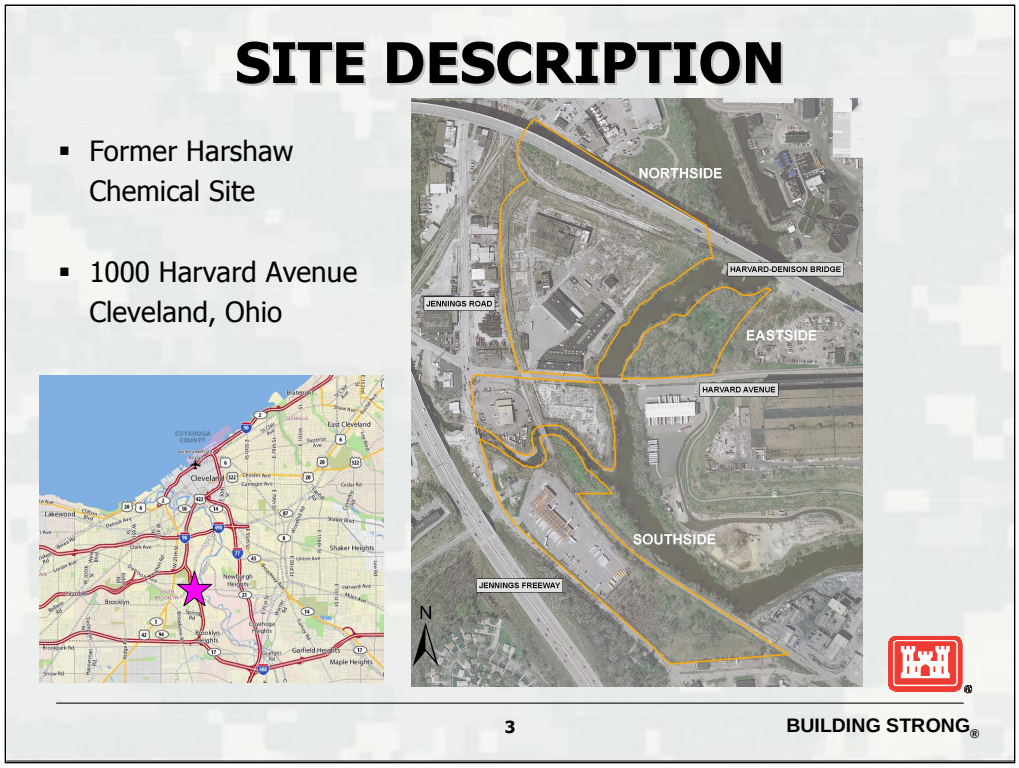
Speaker: D. Lenhardt, Corps Buffalo District Project Manager

- Welcome audience to the Harshaw Public Information Session
- Introduction of Corps Team
- Intent of meeting is to provide an update on progress and present the results of the Remedial Investigation
- Meeting schedule 7-9 PM:
    - o Project Introduction (5 minutes)
    - o Remedial Investigation Summary (30 minutes)
    - o Next Steps (5 minutes)
    - o Project Schedule
    - o Audience Questions & Answers (±20 minutes)
    - o Corps Team available through 9 PM for any follow-on discussions




Speaker: J. DeVaughn, SAIC Project Manager

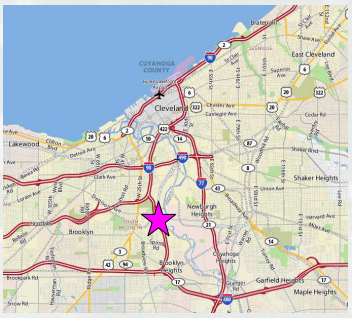
- Located at 1000 Harvard Avenue in Cleveland, Ohio; approximately 3 miles south of downtown Cleveland
- Total size is approximately 55 acres
- Located within an industrialized area adjacent to the Cuyahoga River and Big Creek
- Consists of several developed and undeveloped land parcels with multiple property owners
- Current site use is limited to storage and warehousing operations

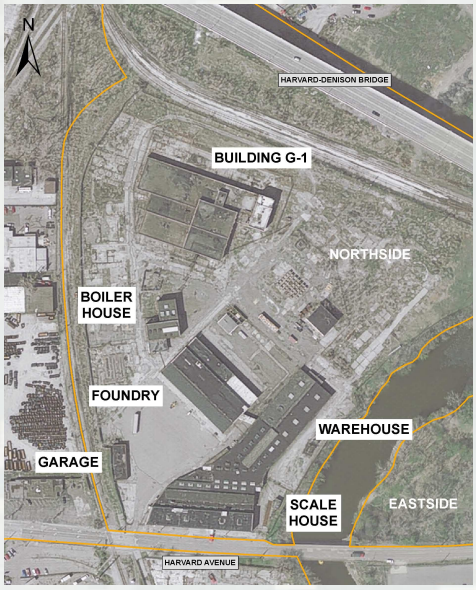
- To support implementation of the CERCLA process, the site has been divided into three distinct areas:
    - o Northside – includes soil, buildings, sanitary/storm sewers, and groundwater north of Big Creek/west of Cuyahoga River (also includes sediment/surface water)
    - o Southside – includes soil and groundwater south of Big Creek/west of Cuyahoga River
    - o Eastside – includes soil and groundwater east of Cuyahoga River

- Existing buildings remaining from the government operational period are located within the Northside area and include:
    - o Building G-1
    - o Boiler House
    - o Foundry
    - o Warehouse
    - o Garage
    - o Scale House

# SITE DESCRIPTION

- Former Harshaw Chemical Site
- 1000 Harvard Avenue Cleveland, Ohio






3A

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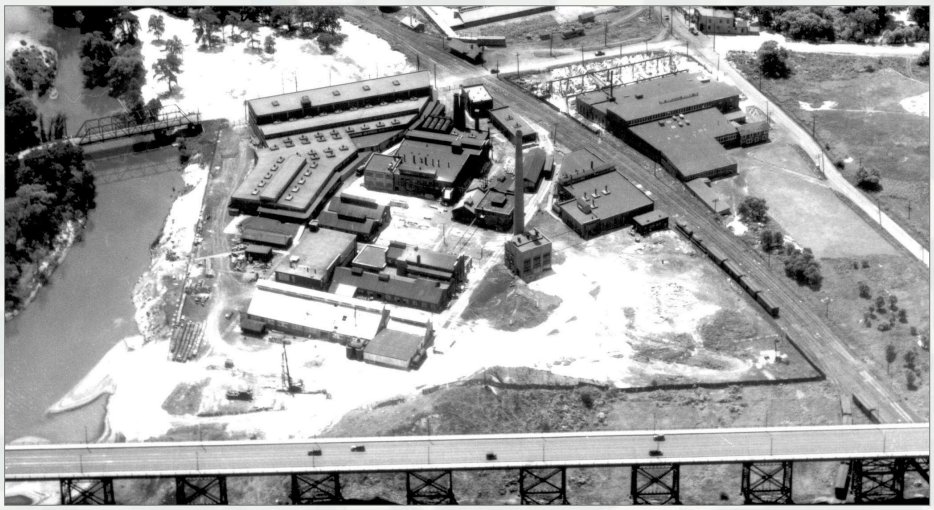
# FACILITY TIMELINE



**1930**

4

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- Period of government contracted research and production activities extended from 1942 through 1959
- Initial government contracted activities were conducted for the Manhattan Engineer District
- In 1947 all Manhattan Engineer District activities were transferred to the Atomic Energy Commission
- Research and production activities included chemical and radiological compounds
- The primary radiological production activities involved uranium compounds transferred to other government facilities for further processing

- Site History:
  - o Harshaw Chemical Company initially purchased by the Harshaw, Fuller & Goodwin Company in 1905
  - o Commercially manufactured chemical solvents, metal salts, fluorides, hydrofluoric acids
  - o 1930 Photo – view of the Northside area in 1930 looking south over original Harvard-Denison bridge toward Harvard Avenue (prior to government activities); Building G-1 and Laboratory absent
  - o Production of chemical/radiological compounds for the Manhattan Engineer District began late 1942
  - o 1945 Photo – view of the Northside area in 1945 south of Harvard Avenue looking north; Laboratory and other structures present
  - o 1946 Photo – view of the Northside area in 1946 looking south toward Harvard Avenue; Building G-1 and other new structures present

- The Atomic Energy Commission assumed control of government operations on January 1, 1947
  - o Harshaw conducted other government chemical/radiological research and production activities through 1959
  - o Harshaw continued commercial chemical production activities after the period of government contracted operations ended in 1959

- Harshaw produced uranium products under as many as 12 government contracts
  - o Harshaw processed approximately 5,000 metric tons of uranium materials between 1942 and 1954
  - o Harshaw uranium products produced for the government included uranium tetrafluoride (UF4), uranium hexafluoride (UF6) and uranium trioxide (UO3)
  - o 1955 Photo – view of Building G-1 from original Harvard-Denison bridge looking west; ongoing production operations late in the period of government operations

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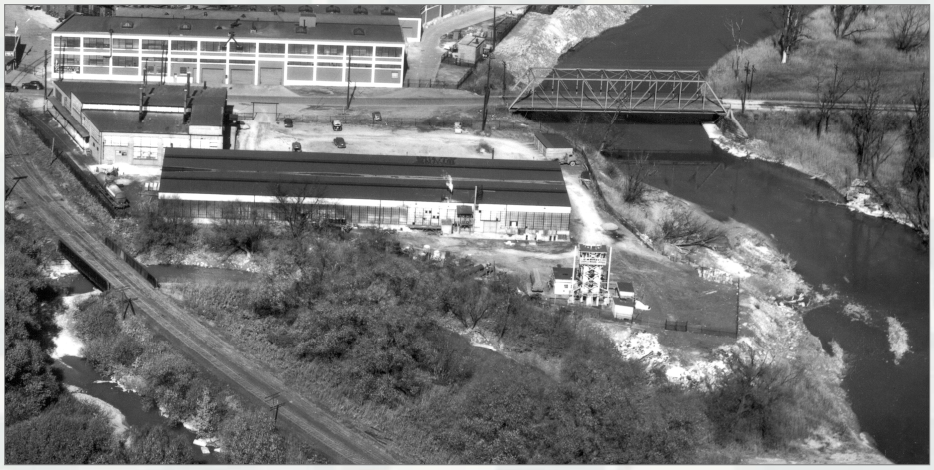

**1945**

4A

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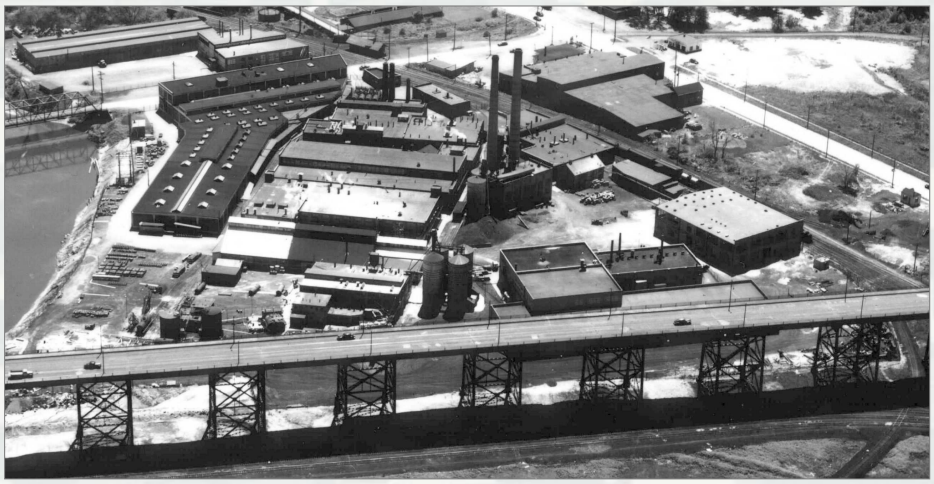

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4B

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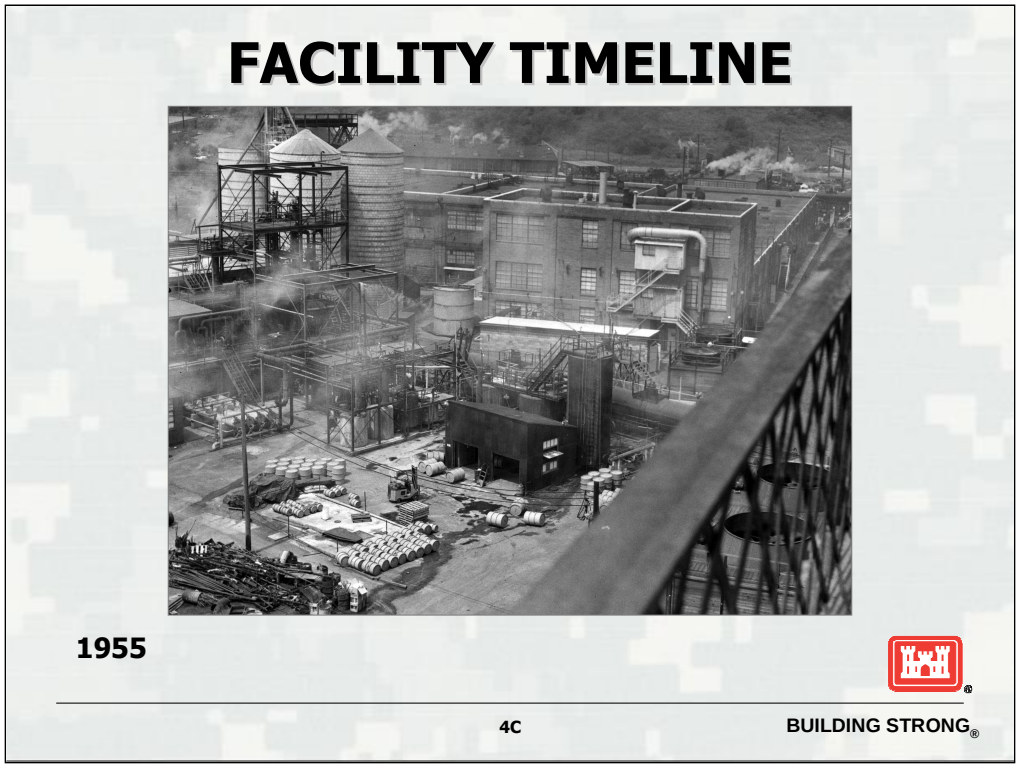


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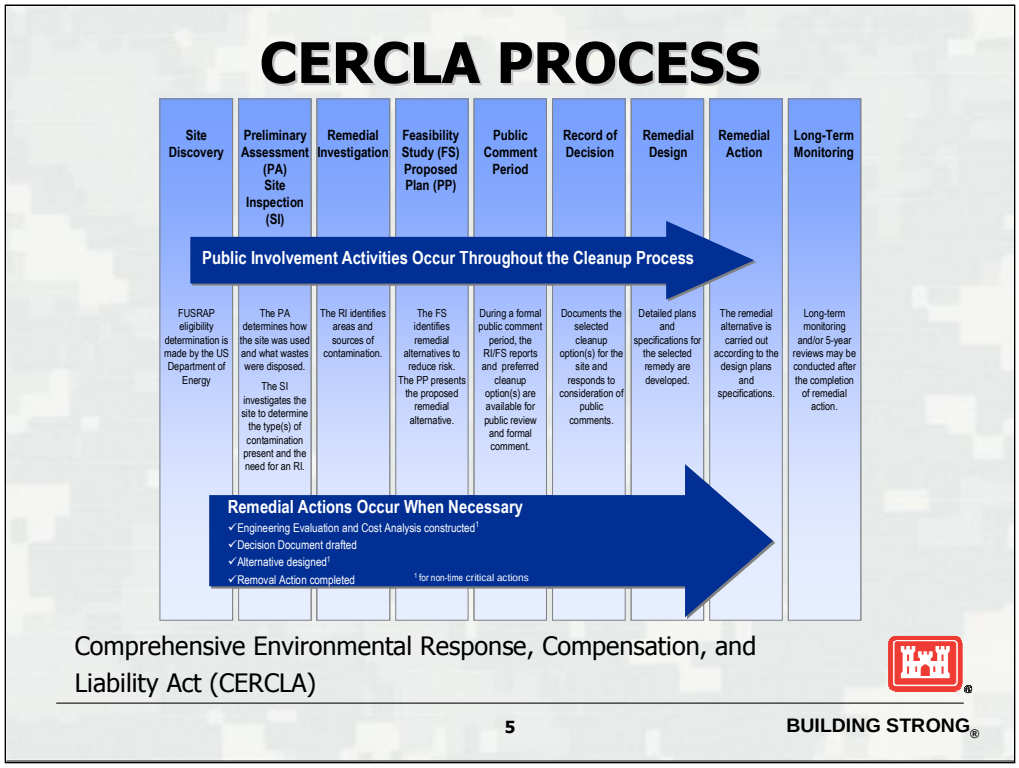
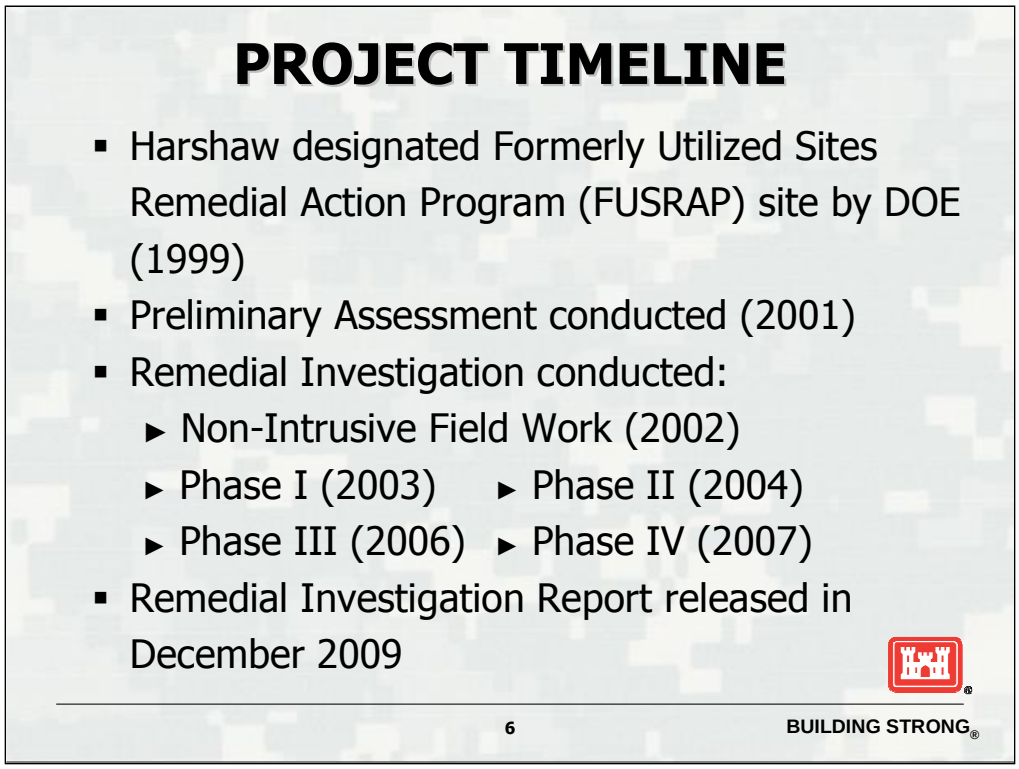
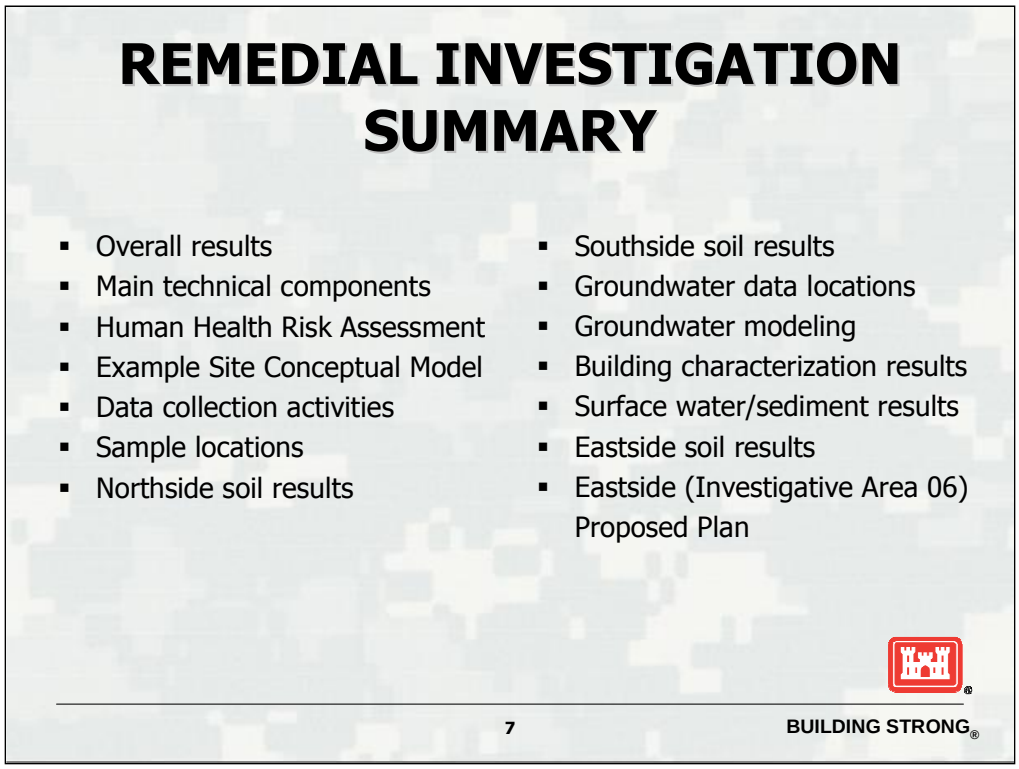



- Remedial action at Harshaw is being conducted under the Formerly Utilized Sites Remedial Action Program (FUSRAP) by the US Army Corps of Engineers
- FUSRAP was initiated in 1974 to identify, investigate and clean up or control sites throughout the US that became contaminated as a result of the Nation's early atomic energy program
- Responsibility for FUSRAP was transferred from the US Department of Energy to the Corps in 1997
- Remedial actions at FUSRAP sites are implemented according to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) process
- The CERCLA process consists of site assessment, site investigation, remedial alternative development/evaluation, remedial design/implementation, and long term monitoring
- Removal actions may be conducted at any time if an imminent threat to human health or the environment is identified
- Public involvement is a key component of the CERLCA process and is incorporated through the cleanup process

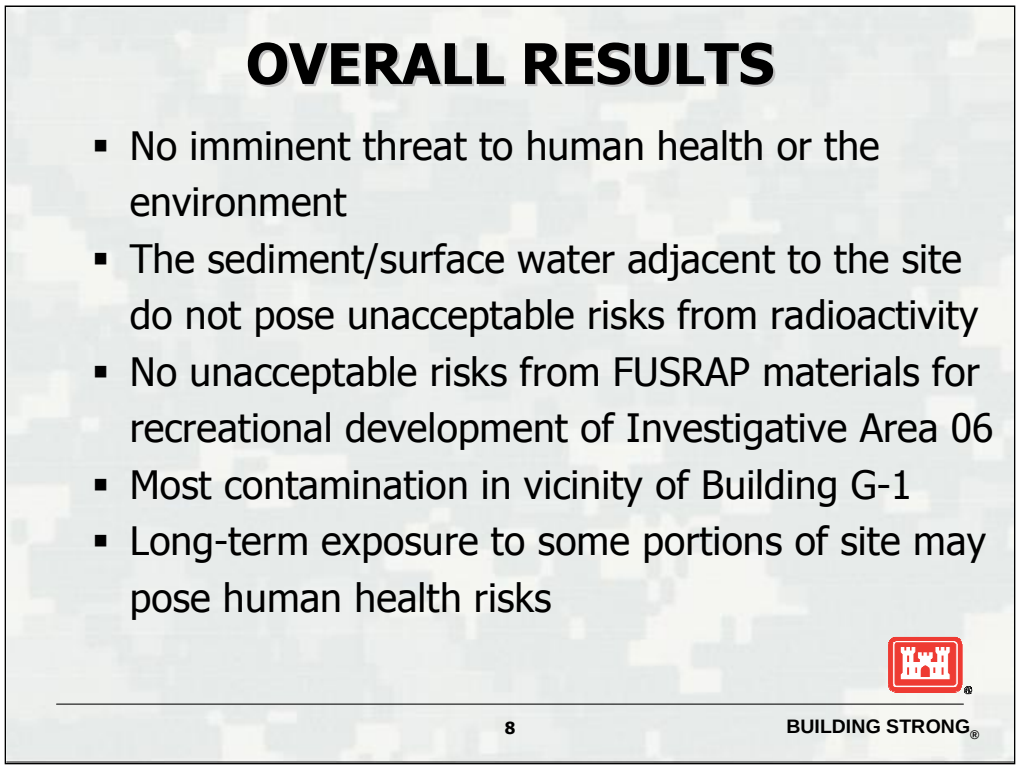



- Property owners conducted initial site investigation, remediation, and building demolition activities prior to the inclusion of Harshaw in the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1999
- The Corps conducted a Preliminary Assessment in 2001 and determined there was no imminent threat to human health or the environment
- The confirmed presence of FUSRAP contamination warranted further investigation and a Remedial Investigation was performed
- The primary objectives of the Remedial Investigation were to determine the nature and extent of FUSRAP contamination and any potential unacceptable risks to human health or the environment

- The Remedial Investigation was conducted in multiple field phases:
  - o Non-Intrusive Field Work: site clearing, gamma radiation walkover and geophysical surveys (2002)
  - o Phase I Field Work (2003): environmental sampling (soil, groundwater, surface water, sediment) and building characterization; total of 4 chemical and 10 radiological constituents (plus daughters) investigated
  - o Phase II Field Work (2004): environmental sampling and building characterization to address Phase I data gaps; total of 12 radiological constituents (plus daughters) investigated
  - o Phase III Field Work (2006): environmental sampling to address data gaps; total of 12 radiological constituents (plus daughters) investigated
  - o Phase IV Field Work (2007): environmental sampling and evaluations to address potential presence of enriched/depleted uranium and associated radionuclides; total of 18 radiological constituents (plus daughters) investigated




- This portion of the presentation will present a summary of the Remedial Investigation conducted at the Harshaw site from 2002 through 2007
- Due to the limited time available this evening and the large amount of information generated during the Remedial Investigation, the following summary will focus on the primary types of data collection activities and the associated results
- A complete copy of the Remedial Investigation Report released in December 2009 has been delivered to the Cuyahoga County Public Library and will be available soon at the Brooklyn Branch
- An electronic copy of the Remedial Investigation Report also is available on the Corps' FUSRAP website (address included at end of presentation)

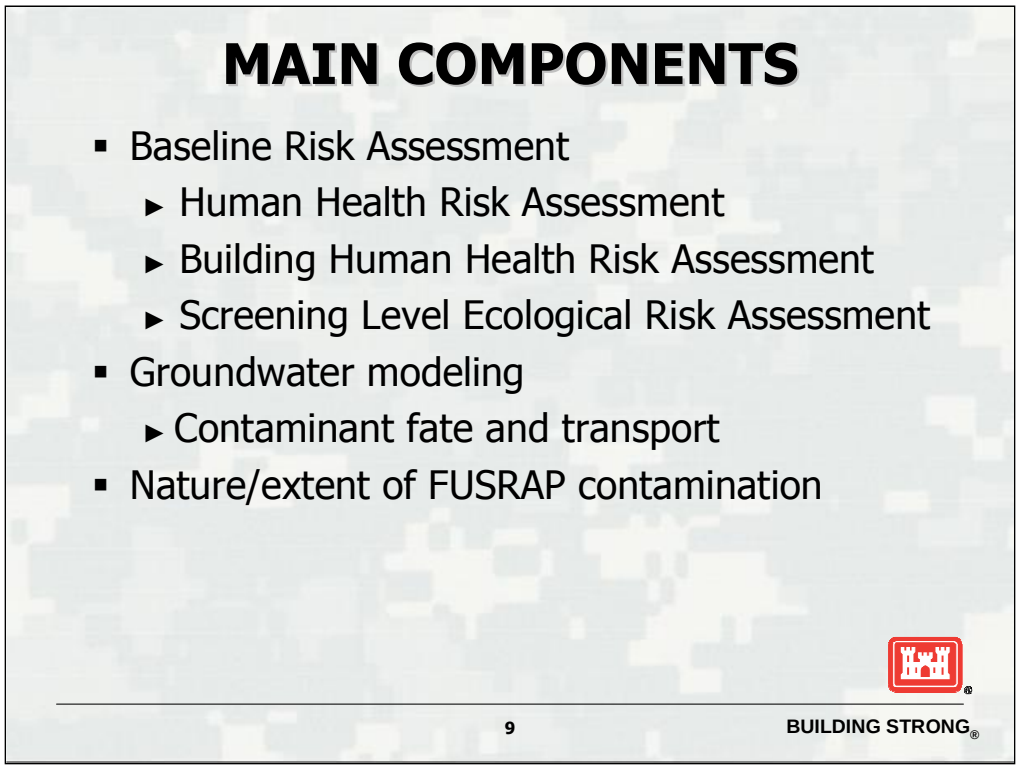



- No significant FUSRAP contamination was identified in sediment or surface water in the Cuyahoga River or Big Creek adjacent to the site
- No unacceptable risks identified for human health or ecological receptors

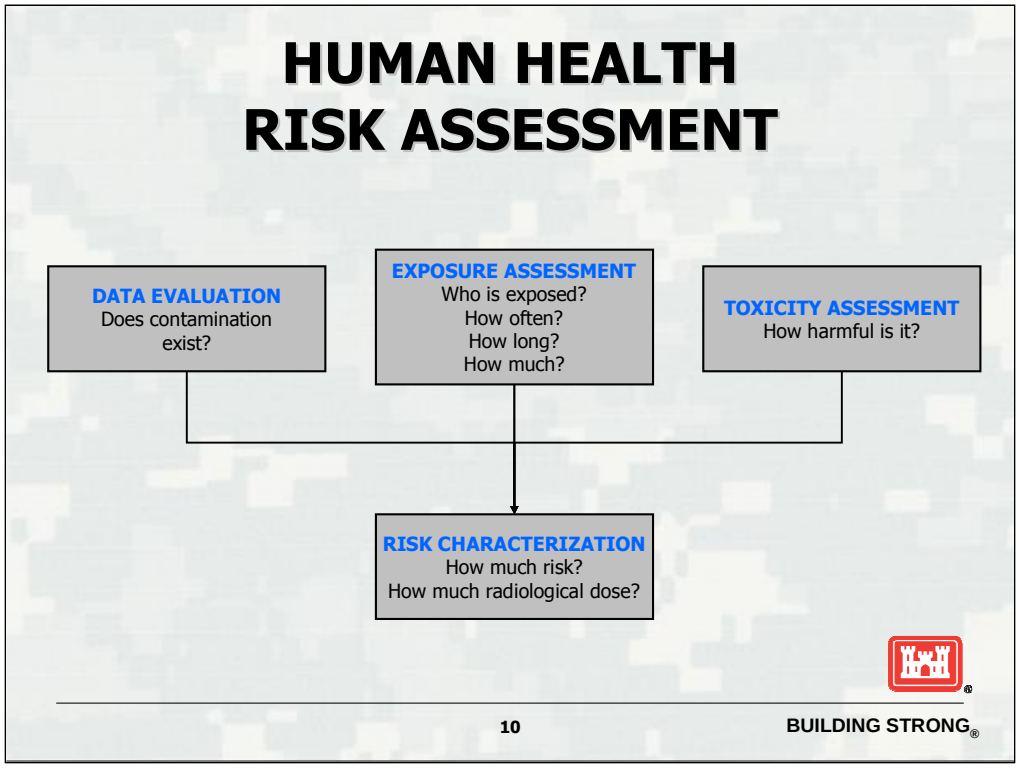
- No significant FUSRAP contamination was identified in the Eastside area (Investigative Area 06)
- These results are consistent with the lack of any buildings or production processes conducted in this area in the past
- No unacceptable risks identified for human health (recreational use) or ecological receptors

- The most significant and widespread FUSRAP contamination within the Northside area (and the site in general) was identified in the general vicinity of Building G-1
- FUSRAP contamination was identified in surface and subsurface soil, within and beneath Building G-1, and in groundwater in this area
- Sub-floor contamination beneath Building G-1 appears to be the primary source for radiological groundwater contamination in the Northside area
- Potentially unacceptable risks to human health were identified in soil, no unacceptable risks identified for ecological receptors

- The most significant FUSRAP contamination within the Southside area was identified in surface and subsurface soil
- The overall number of environmental samples collected in the Southside area is much less than the remainder of the site due to the presence of several private properties and limited access during the Remedial Investigation
- Potentially unacceptable risks to human health were identified in soil, no unacceptable risks identified for ecological receptors




- The Baseline Risk Assessment is conducted to evaluate the potential risks to modeled receptors based on various land-use and exposure scenarios
- The Screening Level Ecological Risk Assessment is conducted to evaluate the potential for unacceptable risks to representative modeled ecological receptors
- Groundwater modeling is used as a predictive tool to support the development and evaluation of potential remedial alternatives and contaminant fate/transport
- The fate and transport of groundwater contamination is used to predict potential future risks and to help evaluate the effectiveness of potential remedial alternatives
- Determining the nature and extent of FUSRAP contamination is one of the key objectives of the Remedial Investigation and supports all subsequent evaluations and assessments conducted under the CERLCA process




- Risk Assessment is a mandated part of the CERCLA Process

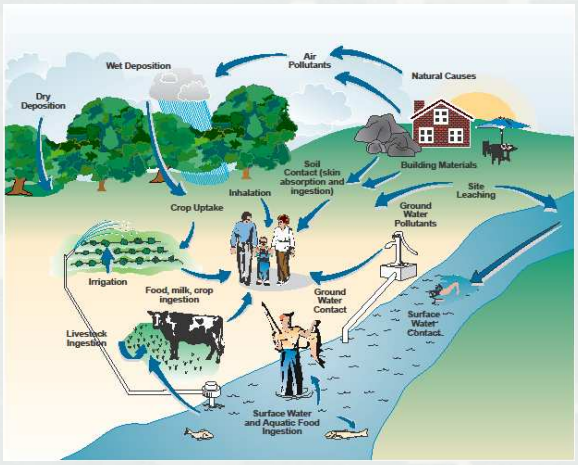
- The Baseline Risk Assessment conducted during the Harshaw Remedial Investigation included three primary components:
    - o Human Health Risk Assessment
    - o Building Human Health Risk Assessment
    - o Screening Level Ecological Risk Assessment

- The Human Health Risk Assessment is conducted to evaluate the potential risks to modeled human receptors based on various land-use and exposure scenarios:
    - o Maintenance worker (current)
    - o Trespasser/recreational user (current/future) adult/adolescent
    - o Industrial worker (future)
    - o Construction worker (future)
    - o Resident (future) adult/child
    - o Subsistence farmer (future) adult/child

- The Building Human Health Risk Assessment addresses potential risks associated with radioactive contamination within or on building surfaces to several modeled worker receptors subject to exposure including:
    - o Industrial worker
    - o Construction worker
    - o Maintenance worker

- The Screening Level Ecological Risk Assessment is conducted to evaluate the potential for unacceptable risks to representative modeled ecological receptors; if potential unacceptable risks are identified then a Baseline Ecological Risk Assessment would be conducted to more thoroughly evaluate these risks

# EXAMPLE CONCEPTUAL SITE MODEL



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- The Conceptual Site Model shown above is a general example to illustrate the types of information included and is not specific to the Harshaw site
- The Conceptual Site Model helps to identify and organize potential exposure pathways and receptors
- The Conceptual Site Model also identifies the pathways that are complete and could lead to exposures to FUSRAP contamination at the site
- Level of exposure depends on frequency & duration (i.e. how often and how long someone is in contact with the substance) - the longer and more frequent the exposure, the greater the subsequent risk would be
- Key components of the Conceptual Site Model include:
    - o Contamination sources
    - o Potential release mechanisms
    - o Exposure media
    - o Exposure routes
    - o Potential receptors

- A Harshaw site-specific Conceptual Site Model was developed initially during Remedial Investigation planning in 2003 and has been updated to incorporate additional information developed during the latter phases of the project

- The Harshaw Conceptual Site Model considered exposures to all FUSRAP-related constituents on the site, both chemical and radiological
- Radiation exposure is very similar to exposure to chemical contamination - except that with radionuclides, there is the additional exposure via external gamma radiation to consider as well
- Gamma exposure drops rapidly as you move away from the source
- The Harshaw Baseline Risk Assessment assumed long-term, chronic exposure (several hours a week for several years) directly to contaminated media on the Harshaw site
- For occasional, short term exposures to the site, the risks would be much less

# DATA COLLECTION ACTIVITIES

Electro-Magnetic Terrain Conductivity

Ground-Penetrating Radar

Gamma Radiation Walkover



- Non-intrusive remote sensing data collection activities were conducted prior to the start of environmental sampling activities
- Gamma radiation walkover and geophysical surveys provided valuable screening data to help direct the planning of subsequent soil sampling

- Gamma radiation walkover surveys were conducted using a gamma radiation detector coupled with a GPS unit
- The gamma detector/GPS combination records survey data and location coordinates every 1 second and allows for the accurate mapping of survey readings
- Accessible surfaces consisting of soil, gravel, concrete, and asphalt were covered by the gamma radiation surveys

- The Electro-Magnetic Terrain Conductivity survey instrumentation records the electrical properties of the soil
- An Electro-Magnetic Terrain Conductivity survey is typically used to detect subsurface metallic objects, but also can identify some types of contamination based on changes in the electrical conductivity in the subsurface

- Ground-penetrating radar surveys were focused on anomalies identified by the Electro-Magnetic Terrain Conductivity surveys
- Ground-penetrating radar identifies solid objects, or significant differences in soil density, within the subsurface

- Electro-Magnetic Terrain Conductivity and ground-penetrating radar methods also were used to conduct surveys for underground utility avoidance during drilling activities in developed areas of the Harshaw site

# DATA COLLECTION ACTIVITIES

Hollow-Stem Auger Rig

Track-Mounted Geoprobe

Track-Hoe Trenching

Truck-Mounted Geoprobe

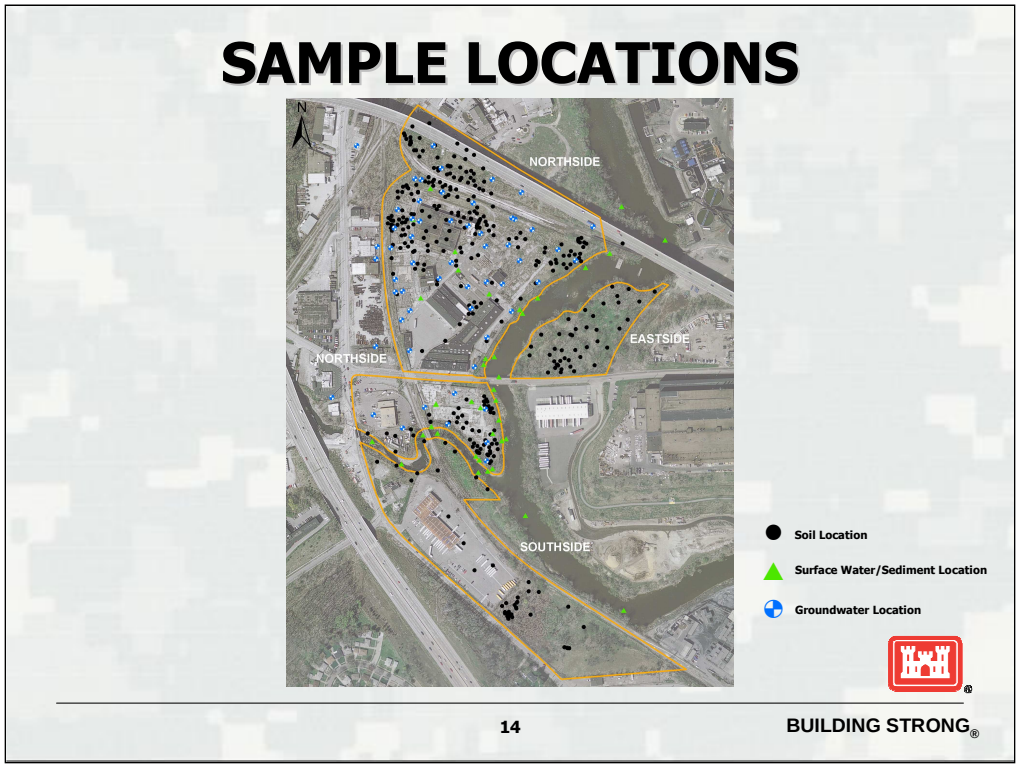


- The hollow-stem auger drilling method was used to conduct subsurface soil sample collection and groundwater monitoring well installations during the Remedial Investigation
- A hollow-stem auger rig is preferred for the installation of deep borings and for drilling in areas with subsurface debris
- Excess soil cuttings generated during drilling were collected and managed as investigation derived waste

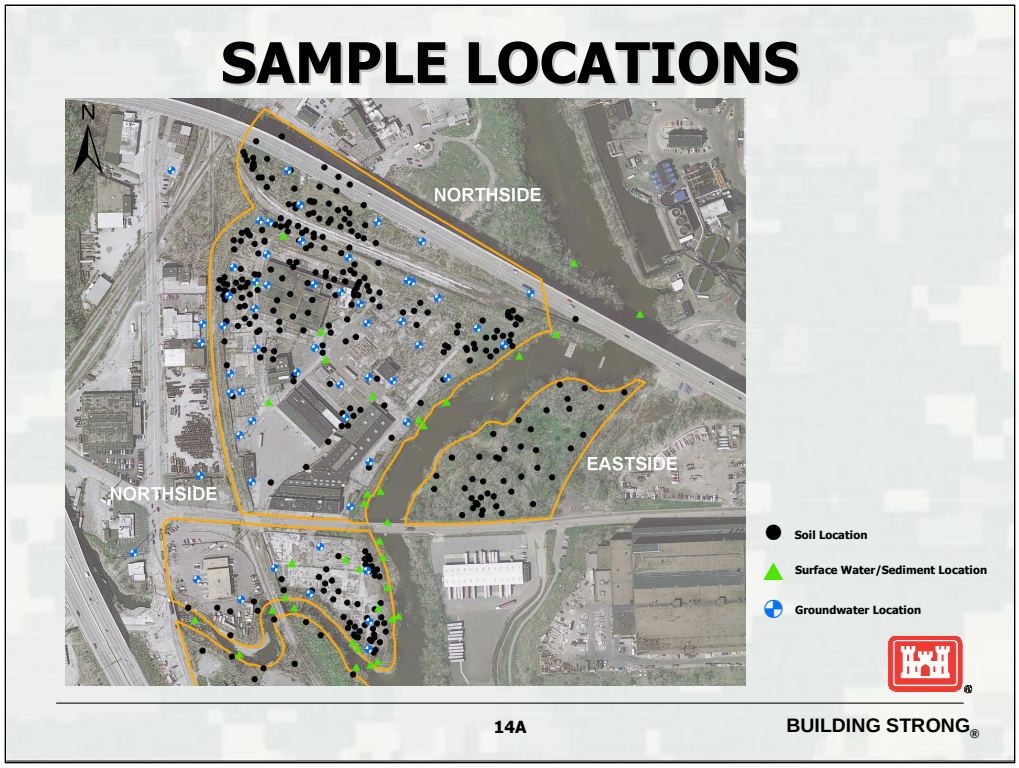
- The Geoprobe drilling method was used to conduct shallow subsurface soil sample collection and temporary well point installations
- Truck-mounted (open paved areas) and track-mounted (off-road, inside Building G-1) Geoprobe units were utilized depending on site conditions
- A Geoprobe drill rig is preferred for the installation of relatively shallow soil borings and for drilling in locations with limited access
- The soil cuttings volume generated by a Geoprobe are much less than a hollow-stem auger rig (due to smaller borehole diameter)

- Excess soil cuttings generated during all drilling activities were collected, managed, and disposed as investigation derived waste

- A track-hoe was used to conduct trenching activities in the Northside area associated with geophysical survey anomaly and sewer line backfill characterization activities
- Soil samples were collected from the track-hoe bucket or using an extended hand auger sampler – no trench entry was conducted by field personnel
- Soil excavated during trenching activities was returned to the original excavation when complete




- The total number of site-wide environmental sample locations and individual samples are summarized below:
  - Soil:
    - 410 Locations
    - 1,212 Samples
  - Sediment:
    - 48 Locations
    - 69 Samples
  - Surface Water:
    - 37 Locations
    - 45 Samples
  - Groundwater:
    - 57 Locations
    - 135 Samples

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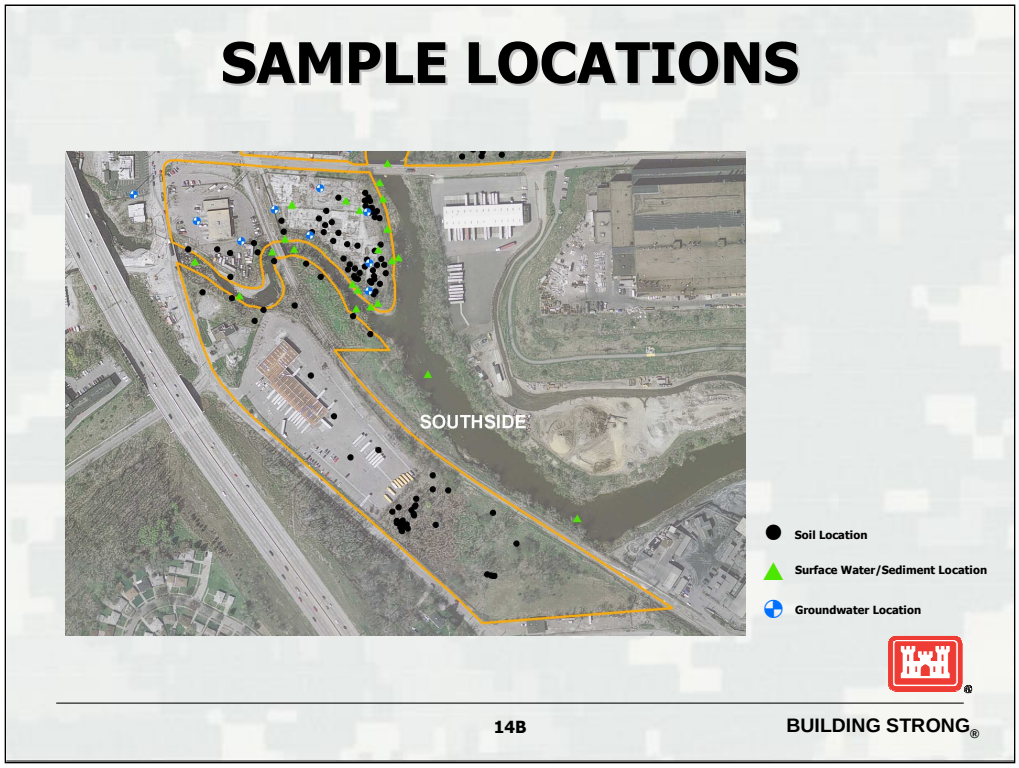


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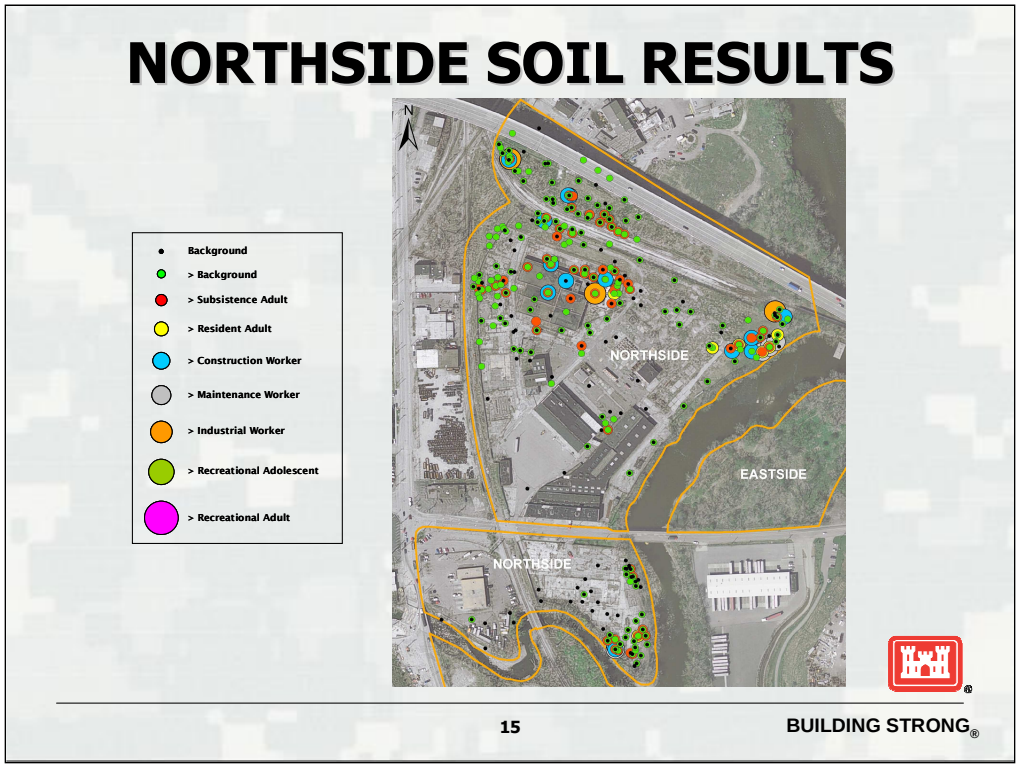
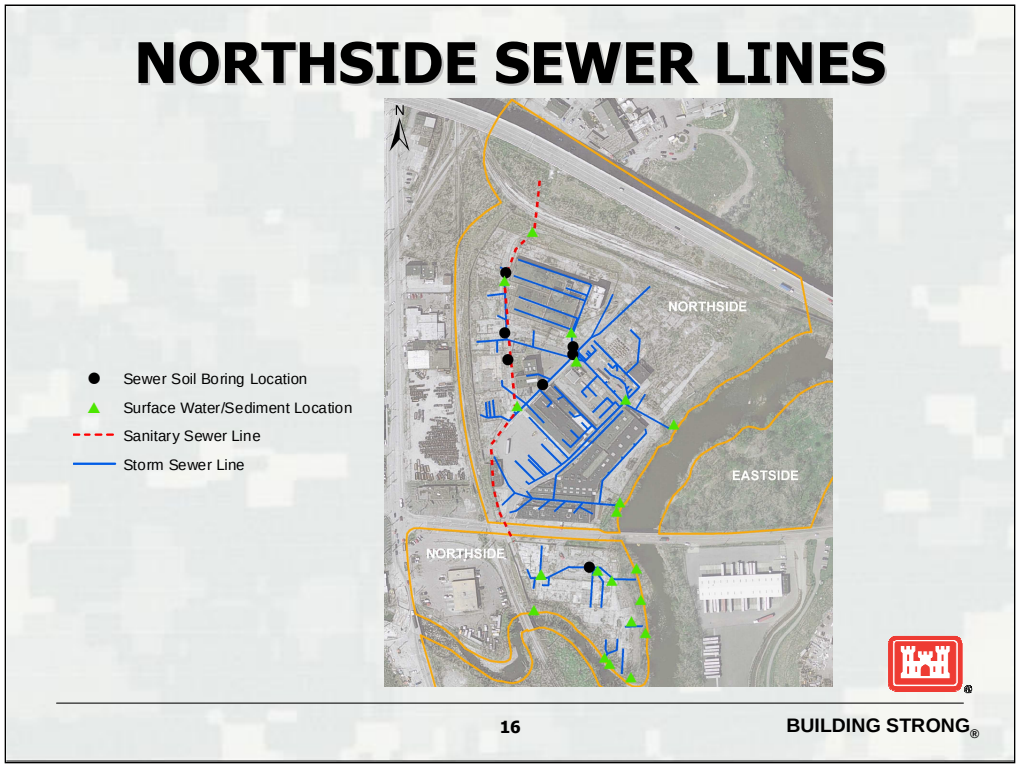



- Multiple symbols in the same location indicate the presence of multiple soil samples at a single location at different depths
- The colored symbols are layered so that all symbols are visible and do not represent specific sample depths
- Increasing symbol sizes and varying colors represent increasing total uranium soil concentration and the associated land-use scenarios (i.e. higher total uranium concentrations are associated with less intensive land-use scenarios)

- The most significant FUSRAP soil contamination in the Northside area was identified in the general vicinity of Building G-1
- This soil contamination is thought to be generally associated with process operations and airborne deposition
- The area of soil contamination north of the railroad tracks appears to be due to the placement of contaminated fill material and debris
- Soil contamination around Building G-1 is generally in shallow soil (i.e. 0 – 10 ft deep)

- Additional FUSRAP soil contamination was identified in surface and subsurface soil along the west bank of the Cuyahoga River
- This soil contamination is thought to be the result of the placement of contaminated fill material during historical filling activities
- Soil contamination depths in this area exceed 20 ft deep

- Another area of FUSRAP soil contamination was identified in the vicinity of the former laboratory building in the southern portion of the Northside area (south of Harvard Avenue)
- This soil contamination is thought to originate from process operations and the placement of contaminated fill material along the river and creek banks
- Soil contamination depths in this area generally vary from 0 – 15 ft deep

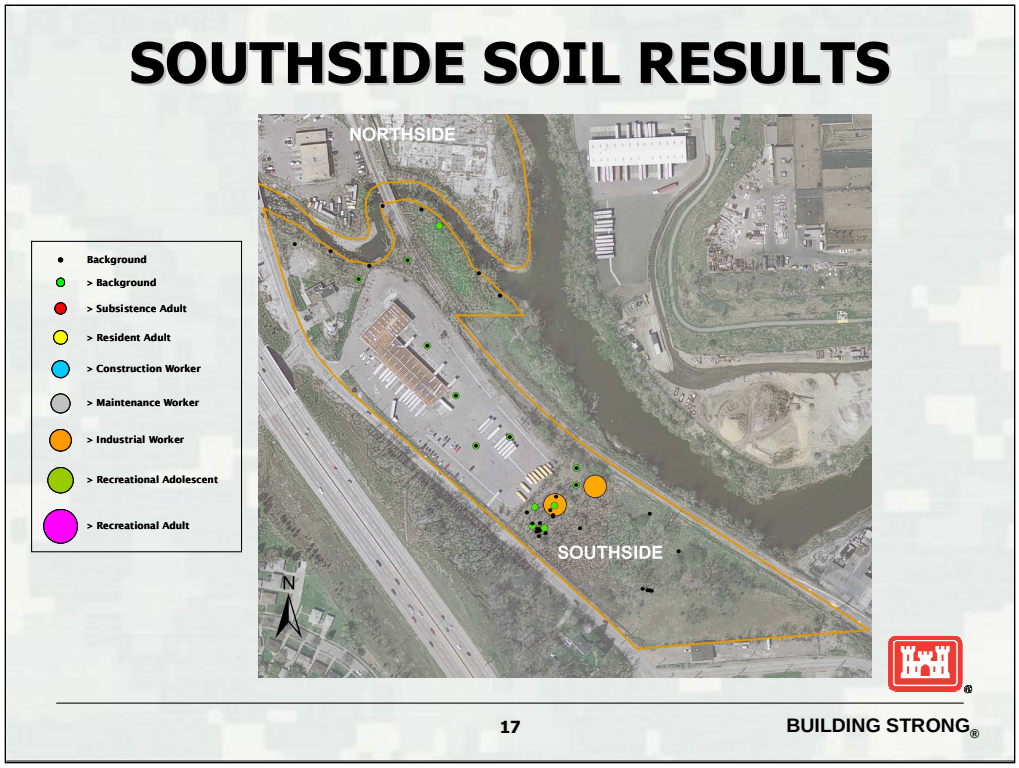



- The sanitary sewer line originates off-site to the north of the Harshaw site and runs to the south to Harvard Avenue
- The storm sewer line network is site-specific and was the primary surface water drainage pathway for the Northside area
- Numerous storm sewer outfalls are located along the west bank of the Cuyahoga River and along the north bank of Big Creek
- The main storm sewer outfall located adjacent to the northeast corner of the Warehouse is normally the only outfall with active surface water discharge

- The sewer lines were characterized by installing soil borings adjacent to the lines in several locations in an attempt to collect backfill soil samples
- Due to the nature of the backfill material, sample recovery was limited
- The difficulties associated with collecting sewer line backfill soil samples led to the installation of a trench at one location along the sanitary sewer line and the storm sewer line

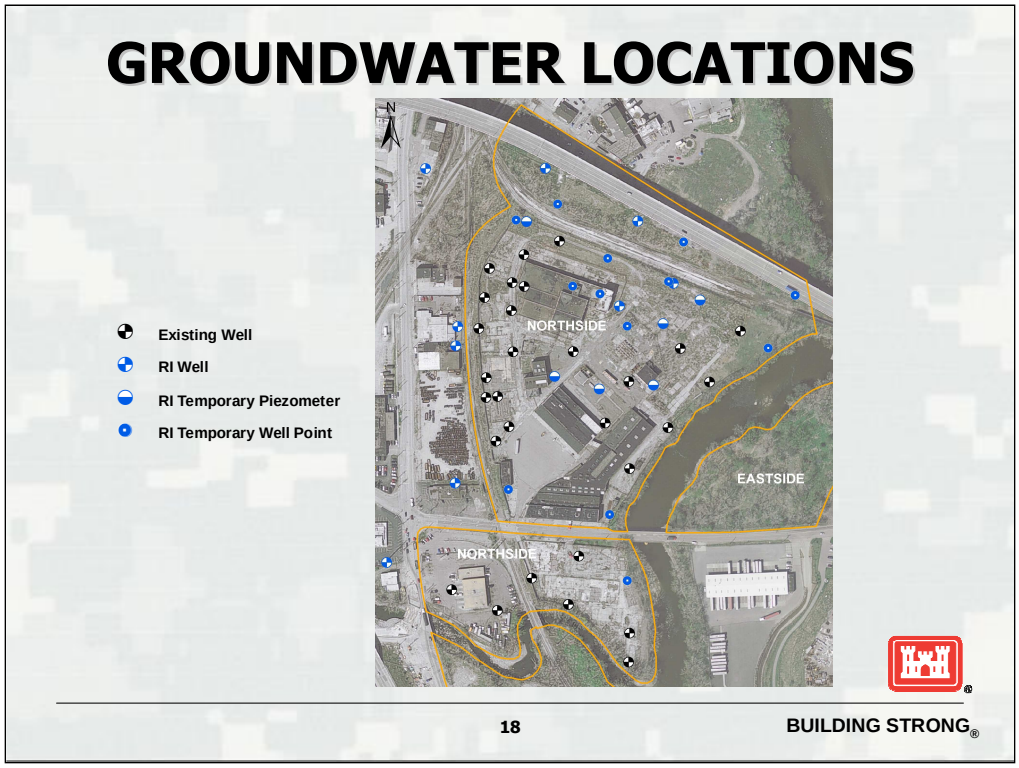
- Water and sediment samples also were collected from within the sanitary sewer line and storm sewer lines at multiple locations to characterize up-gradient and down-gradient conditions

- Although some FUSRAP contamination was identified within the sewer lines, none of the results represented an unacceptable risk to human health or the environment




- Multiple symbols in the same location indicate the presence of multiple soil samples at a single location at different depths
- The colored symbols are layered so that all symbols are visible and do not represent specific sample depths
- Increasing symbol sizes and varying colors represent increasing total uranium soil concentration and less conservative risk receptors

- The only notable FUSRAP soil contamination in the Southside area was identified in the area adjacent to the southern boundary of the Milan Trucking Company property
- This soil contamination is thought to be the result of the placement of contaminated fill material and debris prior to the development of the privately-owned parcels
- Soil contamination in this area is generally in shallow soil (i.e. 0-10 ft deep)



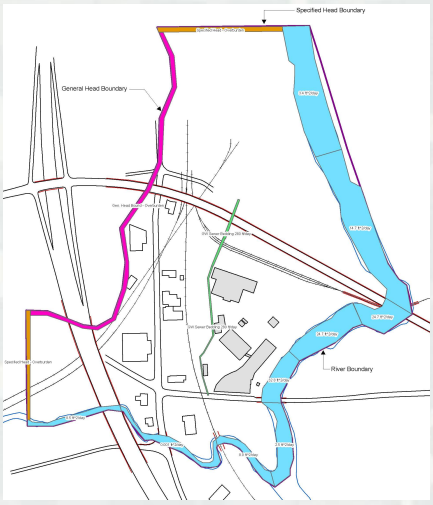

- The figure above illustrates the location of all Northside area groundwater monitoring data collection points used during the Remedial Investigation

- Existing Wells – permanent monitoring wells installed by property owners during previous site investigations (required re-development)
- Remedial Investigation Wells – new permanent monitoring wells installed during the Remedial Investigation
- Remedial Investigation Temporary Piezometers – new temporary piezometers installed during the Remedial Investigation (similar to permanent wells, no surface completions)
- Remedial Investigation Temporary Well Points – new temporary wells points (installed with Geoprobe, small diameter, no surface completions)

- Groundwater samples collected from all locations (Temporary Well Points limited to screening-level samples)
- Groundwater elevation measurements collection from all locations
- Groundwater slug tests conducted at existing and new wells

- No groundwater monitoring locations were installed in the Southside or Eastside areas during the Remedial Investigation
- No apparent potential sources for groundwater contamination (based on soil results)
- Southside area groundwater is physically isolated from Northside groundwater by Big Creek
- Eastside area groundwater is physically isolated from Northside groundwater by the Cuyahoga River

# GROUNDWATER MODELING




Model Boundaries

Particle Tracking Results

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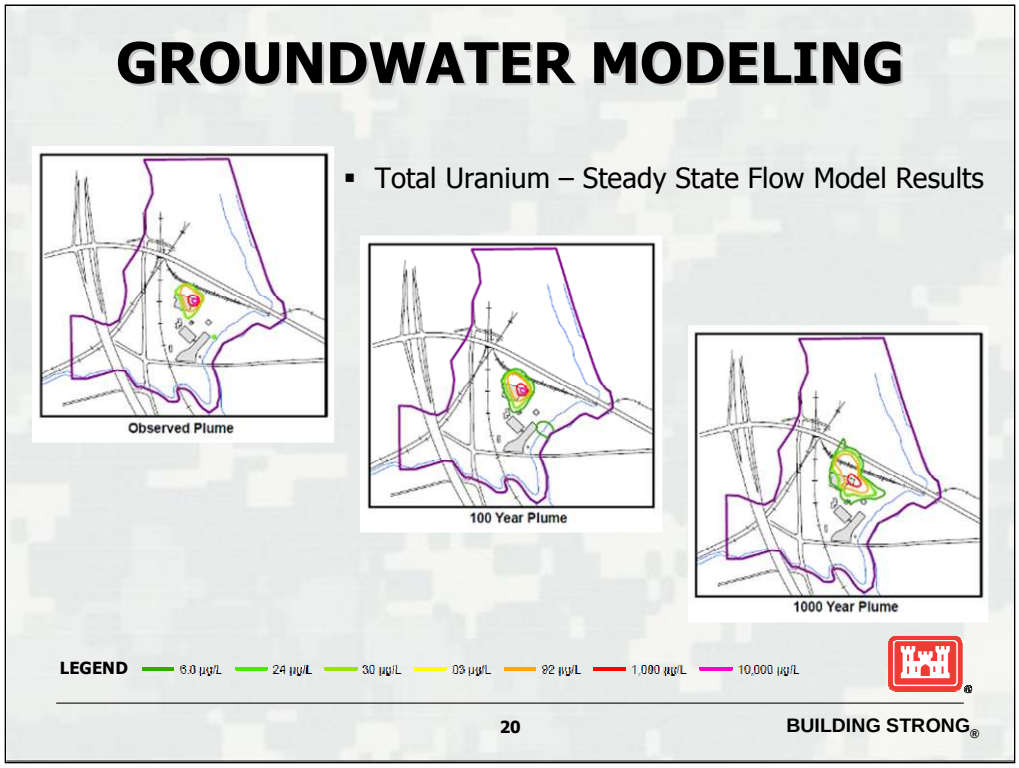
- Groundwater modeling conducted using numerical groundwater flow, particle tracking, and solute transport models
- Used to estimate near-term and future risks associated with site contaminants in groundwater
- The particle-tracking and contaminant transport models incorporate field measurements so that model starting conditions match actual current conditions at the site

- The Model Boundaries map (left) shows the extent of the modeled area for Northside groundwater and the different types of boundary conditions applied to groundwater flow

- The Particle Tracking Results map (right) shows how "contamination" particles move from their starting locations (dark green) to their ending locations (yellow/red) through time (total simulation time approximately 29 years)




- The figure above presents the groundwater flow model results for Total Uranium in Northside groundwater

- The Observed Plume map (left) depicts the current extent of Total Uranium groundwater contamination (i.e. model calibrated to Remedial Investigation results)
- The 100 Year Plume map (center) depicts the predicted extent of Total Uranium groundwater contamination 100 years into the future
- The 1000 Year Plume map (right) depicts the predicted extent of Total Uranium groundwater contamination 1000 years into the future

- Overall, the groundwater model simulation indicates the relatively slow migration of the Northside FUSRAP contamination plume

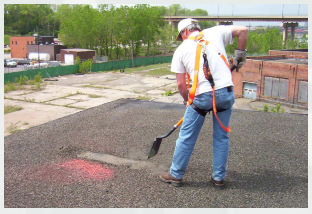
- Also, the lack of significant FUSRAP contamination found in surface water and sediment sample results from Big Creek and the Cuyahoga River support the groundwater model findings

# BUILDINGS

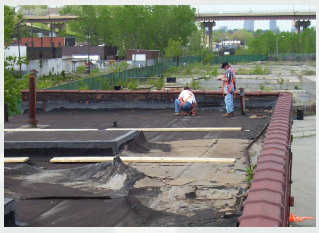
Radiation Survey

Floor Coring

Wall Sample



Roof Gravel Sample



Radiation Survey



- Building characterization methods utilized during the Remedial Investigation include:
  - o Fixed-point activity surveys (alpha/beta radiation)
  - o Removable activity surveys (alpha/beta radiation)
  - o Surface activity scans (beta radiation)
  - o Dose rate surveys (gamma radiation)
  - o Volumetric samples (radiological and waste disposal constituents)

- Building characterization was conducted for exterior surfaces and interior surfaces not studied during previous investigations conducted by the property owners
- Typical building surfaces evaluated include roofs, walls, windowsills, parapets, floors, and ceilings

- Volumetric building material samples were collected from roofs, walls, windowsills, and floors to assess the presence of radiological contamination and for general waste disposal associated with potential future remediation or demolition activities

# BUILDING RESULTS

- Interior/exterior surfaces
- Radiological dose greater than 25 mrem/year

| | Building G-1 | Boiler House | Foundry | Warehouse | Garage | Scale House |
|---|---|---|---|---|---|---|
| Industrial Worker | × | × | | | | × |
| Construction Worker | × | × | × | × | × | × |
| Maintenance Worker | × | | × | | | |



- The above table summarizes the radiological risk receptors associated with a modeled future dose rate greater than 25 mrem/year
- An "X" indicates the presence of an unacceptable radiological risk for the specific receptor due to FUSRAP contamination on interior and/or exterior building surfaces

- Typical examples of impacted exterior building surfaces include:
  - o Horizontal surfaces where airborne contamination accumulated (roofs, windowsills)
  - o Walls where airborne contamination accumulated

- Typical examples of impacted interior building surfaces include:
  - o Floors, walls, sumps (directly contaminated by process operations)
  - o Any interior surface subject to runoff due to leaks in roofs, walls, windows, etc.

- Building G-1, the former process building, has the most significant radiological contamination
- All other remaining buildings do not exhibit gross levels on contamination – mostly spotty impacts likely due to past airborne contamination

- Two other existing buildings – former and current water treatment plant structures – were constructed well after the period of MED/AEC activities and thus were not included in the Remedial Investigation building characterization effort

# SURFACE WATER/SEDIMENT

Surface Water Sample

Big Creek Water Sample

Cuyahoga River Water Sample

Sediment Sample

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- No significant FUSRAP contamination was identified in sediment or surface water in the Cuyahoga River or Big Creek adjacent to the site
- No unacceptable risks identified for human health or ecological receptors

- The photos above depict the various methods used to collect surface water and sediment samples from the Cuyahoga River and Big Creek during the Remedial Investigation

- Photo Upper Left – surface water grab sample collection in Big Creek
- Photo Upper Right – surface water grab sample collection in Big Creek (difficult location, note the safety harness/line)
- Photo Lower Left – surface water grab sample collection in Cuyahoga River
- Photo Lower Right – sediment sample collection in Cuyahoga River

# EASTSIDE SOIL

Cuyahoga River Bank

Civil Survey

Survey Control Line

Geoprobe Soil Sampling

Site Clearing

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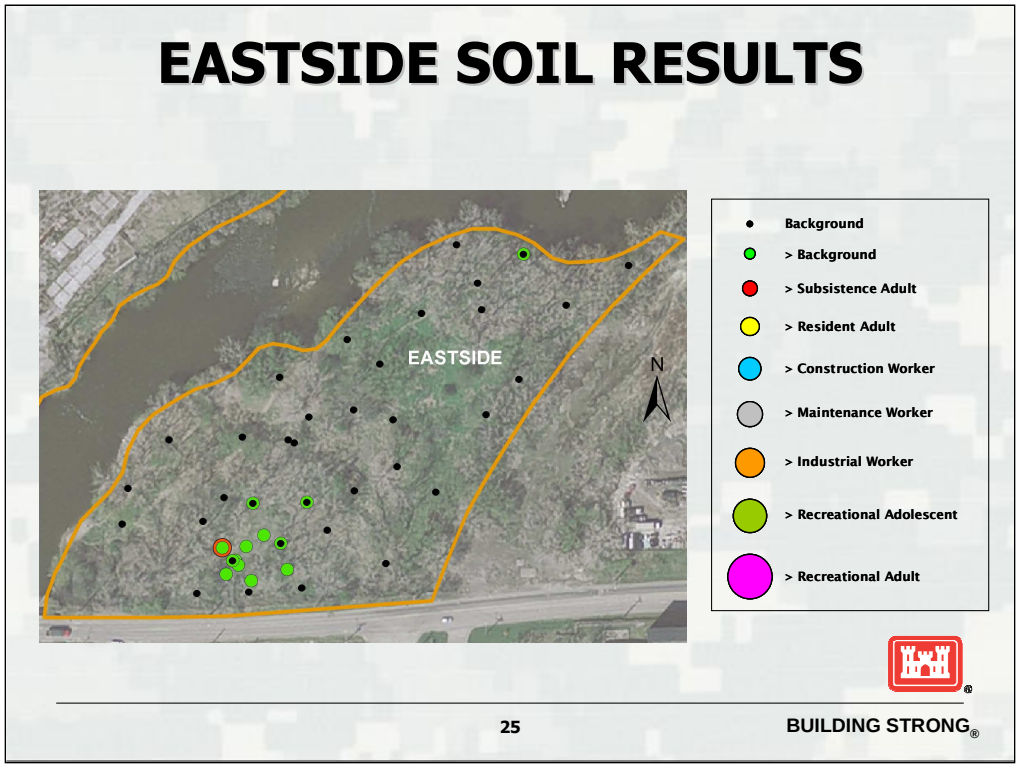
- The photos above illustrate the data collection activities conducted in the Eastside area during the Remedial Investigation

- Photo Upper Left – view of the Eastside area, northern Cuyahoga River bank looking south
- Photo Upper Middle – civil survey conducted to establish control points for gamma radiation walkover and geophysical surveys
- Photo Upper Right – gamma radiation walkover and geophysical survey control line
- Photo Lower Left – Geoprobe soil sampling in the Eastside area
- Photo Lower Right – north central portion after site clearing (note former sheet pile wall)




- Multiple symbols in the same location indicate the presence of multiple soil samples at a single location at different depths
- The colored symbols are layered so that all symbols are visible and do not represent specific sample depths
- Increasing symbol sizes and varying colors represent increasing total uranium soil concentration and less conservative risk receptors

- No significant FUSRAP soil contamination was identified in Eastside soil
- The limited soil contamination is thought to be associated with the placement of fill material and debris
- The limited soil contamination in this area is present in shallow soil (i.e. 0 – 10 ft deep)
- The highest concentrations of contamination are well below the levels associated with future recreational land use

# EASTSIDE (IA06) PROPOSED PLAN

- Proposed Plan public release scheduled for 2010
- Recommended remedial alternative will be no further FUSRAP action based on recreational development

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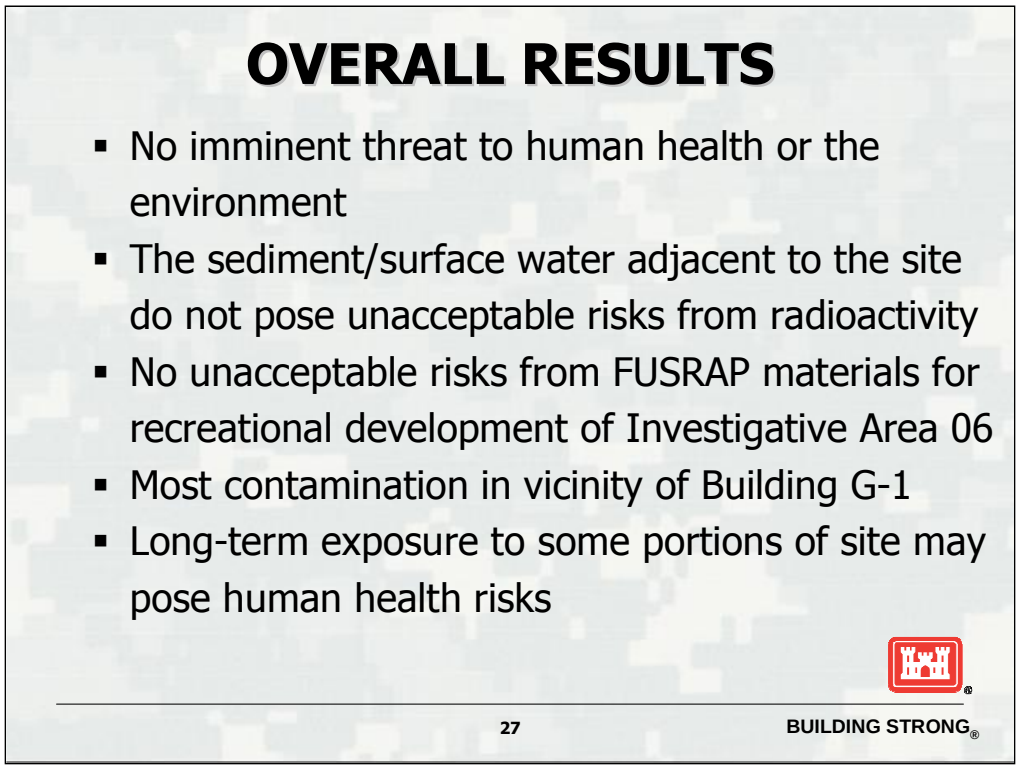
- The lack of significant FUSRAP contamination in the Eastside area formed the basis for the recommended FUSRAP remedial alternative of no further FUSRAP action in the Proposed Plan
- The Eastside area also was identified as Investigative Area 06 (IA06) during the Remedial Investigation
- The recommended remedial alternative will be no further FUSRAP action based on recreational development
- The conditions identified during the Remedial Investigation and the potential use of this property as part of the Ohio Canal Corridor – Towpath Trail also supported the acceleration of the Eastside area through the CERCLA process (relative to the remainder of the site)

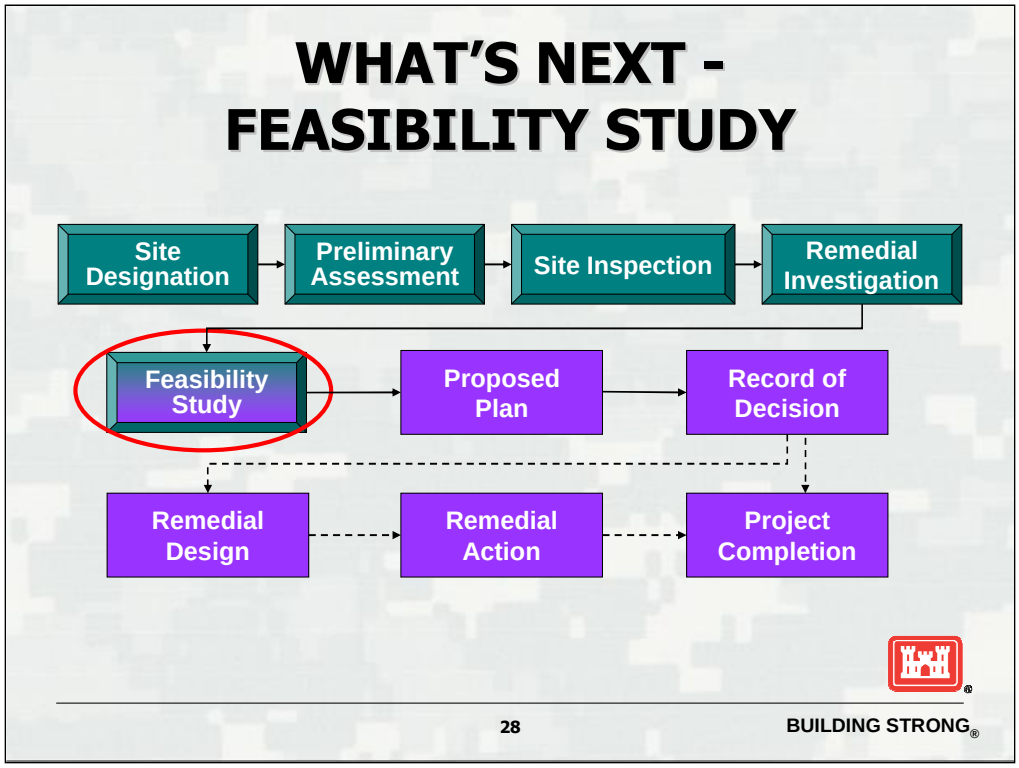



- No significant FUSRAP contamination was identified in sediment or surface water in the Cuyahoga River or Big Creek adjacent to the site
- No unacceptable risks identified for human health or ecological receptors

- No significant FUSRAP contamination was identified in the Eastside area (Investigative Area 06)
- These results are consistent with the lack of any buildings or production processes conducted in this area in the past
- No unacceptable risks identified for human health (recreational use) or ecological receptors

- The most significant and widespread FUSRAP contamination within the Northside area (and the site in general) was identified in the general vicinity of Building G-1
- FUSRAP contamination was identified in surface and subsurface soil, within and beneath Building G-1, and in groundwater in this area
- Sub-floor contamination beneath Building G-1 appears to be the primary source for radiological groundwater contamination in the Northside area
- Potentially unacceptable risks to human health were identified in soil, no unacceptable risks identified for ecological receptors

- The most significant FUSRAP contamination within the Southside area was identified in surface and subsurface soil
- The overall number of environmental samples collected in the Southside area is much less than the remainder of the site due to the presence of several private properties and limited access during the Remedial Investigation
- Potentially unacceptable risks to human health were identified in soil, no unacceptable risks identified for ecological receptors




Speaker: D. Lenhardt, Corps Buffalo District

- The next step in the CERCLA process is to conduct a Feasibility Study to address FUSRAP contamination identified in the Remedial Investigation

- The Feasibility Study is normally a two year process and will include the following key components:
  - o Development of remedial alternatives
  - o Evaluation of these alternatives based on criteria such as protection of human health and the environment, effectiveness, implementability, cost, and public acceptance
  - o Identification of any additional data needs that may require further investigation during the development and assessment of remedial alternatives

- Work on the Feasibility Study began in late 2009

- The follow-on Proposed Plan and Record of Decision phases of the FUSRAP CERCLA process normally require one year each to complete

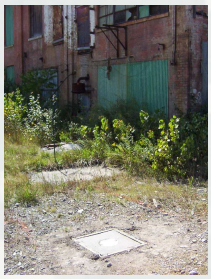
- As mentioned previously, the Eastside area (IA06) will proceed through the Proposed Plan and Record of Decision steps of the CERCLA process ahead of the rest of the Harshaw site
- The Eastside (IA06) Proposed Plan will be made available for public comment when it is released later in 2010

# WHAT'S NEXT - GROUNDWATER MONITORING

- Long-term evaluation during CERCLA process
- Annual sampling of select monitoring wells

New Wells - Stickup

New Well Installation



New Well – Flush Mount

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- The intent of the long-term groundwater monitoring program is to identify any potential changes in groundwater conditions or contaminant movement at the site during the completion of the CERCLA remedial process
- A total of 14 new groundwater monitoring wells were installed in 2008 to support the long-term monitoring program and the Feasibility Study
- The long-term groundwater monitoring program currently includes a total of 19 groundwater monitoring wells located in Northside and Southside areas
- Groundwater monitoring wells included in the program are scheduled to be sampled annually

# CONTACT US

- USACE Buffalo District FUSRAP Team

Website: www.lrb.usace.army.mil/fusrap

FUSRAP E-Mail Address: fusrap@usace.army.mil

Mailing Address:
FUSRAP Team
1776 Niagara Street
Buffalo, NY 14207

Telephone:
1-800-833-6390 (Option 4)


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- Feel free to contact us if you have any questions regarding the Harshaw site

- The Corps has a postal mailing list for the site. If you would like to receive the newsletter in the mail, and did not circle yes on the sign-in sheet when you came in, please let us know
- There is a link to Harshaw Site information on the web at the address listed on the slide, tonight's presentation and the panels will be available on the web later this week
- An electronic distribution mailing list (e-mail) also is currently being developed – if interested please sign up with us before you leave
- You may also provide us with your e-mail address using the FUSRAP Team e-mail address noted above

- Public participation is a key component of the CERLCA remedial action process – please join us and be a part of the project as we move forward!

- We will now move to the question and answer portion of this meeting. Are there any questions?