

Building 82 Remedial Investigation

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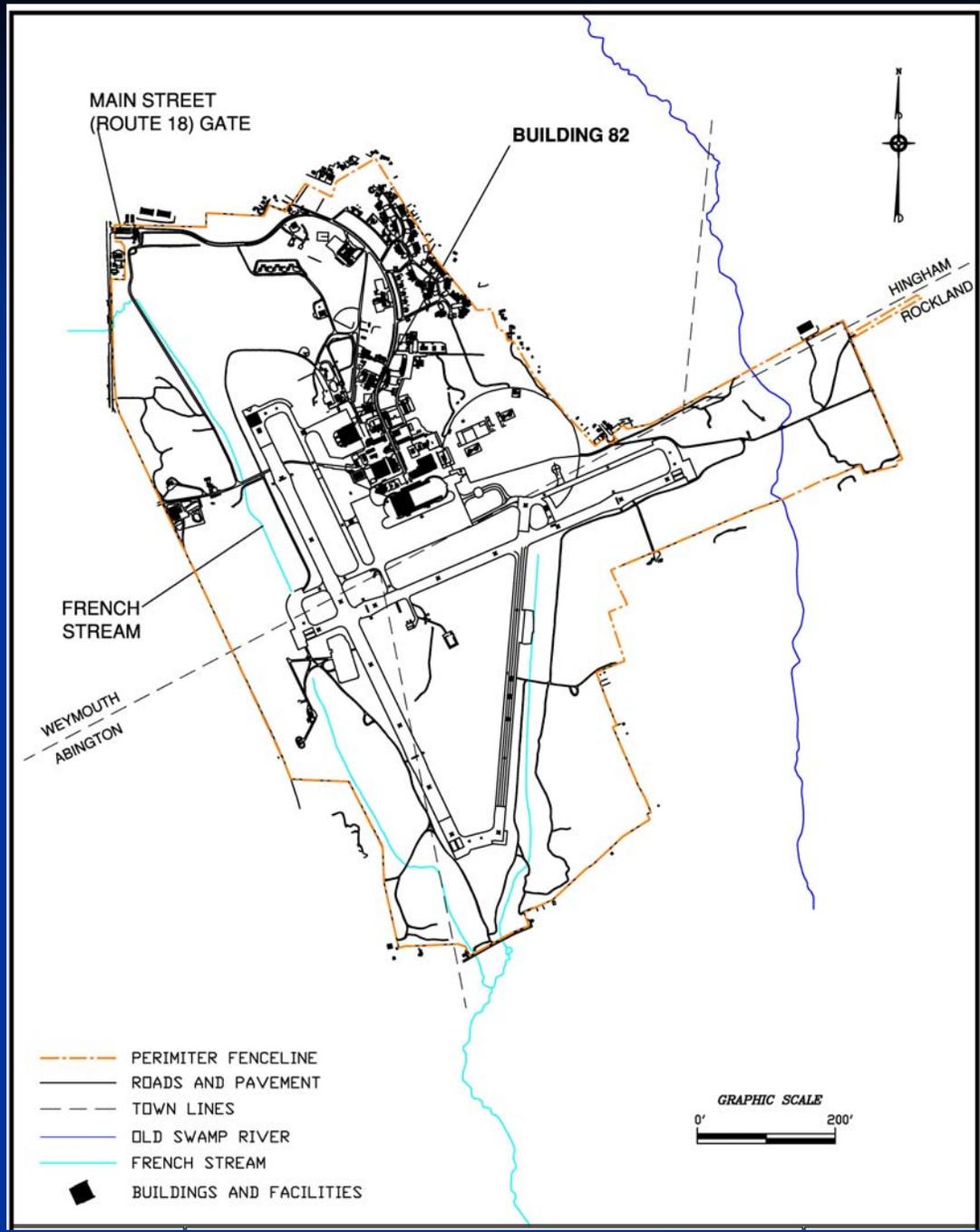
November 8, 2007

Restoration Advisory Board Meeting



Objectives of Tonight's Presentation

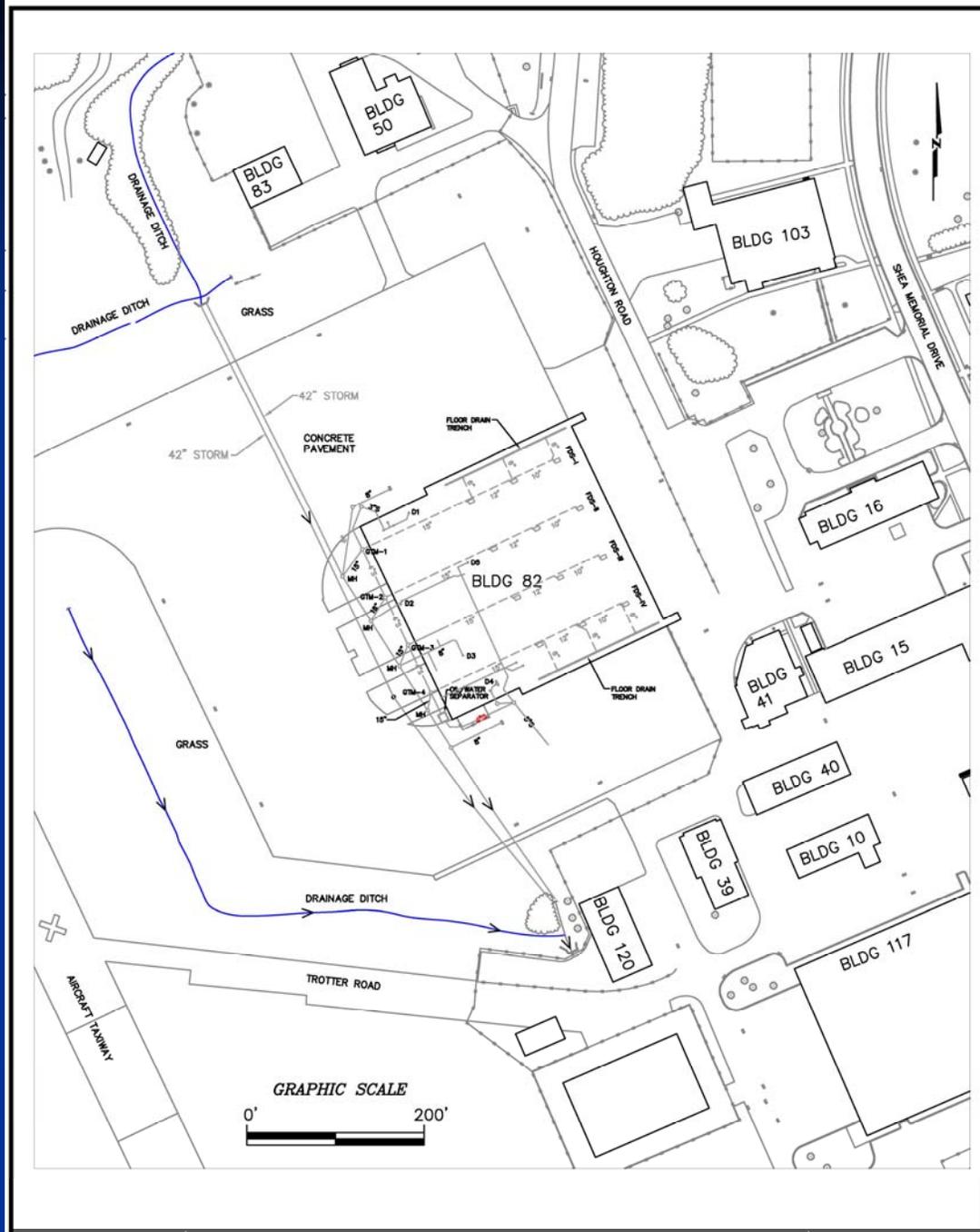
- Review the components of the RI field program
- Describe the nature and extent of contamination
- Identify potential source areas
- Summarize the Human Health and Ecological Risk Assessments
- Present Conclusions and Next Steps



Location of Building 82

Building 82 Background

- Former Aircraft Hanger
 - Used for airplane maintenance and storage
- 10 Acre Site – mostly building & concrete; grass and drainage ditches on N, W, S sides
- Large building (~1.5 Acre) – Hangar area & shop areas for industrial operations
- Floor Drain System in building carried waste fluids to storm sewer that discharged to drainage ditch south of building



Building 82 Site Schematic

Objectives of Remedial Investigation

- Collect, compile, and evaluate data needed to fully characterize the Site
- Identify the source(s) of contamination
- Determine the nature and extent of contamination
- Evaluate contaminant migration on Site
- Identify potential human health and ecological risks posed by Site-related contaminants

Removal Actions

- 1998 - Cleaning and decommissioning of floor drain systems and structures, soil and sludge sampling.
 - VOCs, metals and PAHs in sludge from gas trap manholes.
- 2000 & 2006 – Removal of floor drain systems; soil sampling below removed drainage pipes.
 - Metals and PAHs in soil beneath the drains.
- 2002 – Excavation of sediment from drainage ditch west and south of Building 82 (part of TACAN work).
 - Post-excavation samples showed ditch was clean.

Information and data from these removal actions were used in planning the RI field program and also used in the RI Report.

Previous Investigations

- Four limited investigations conducted at Site from 1999 through 2003
 - Soil borings and monitoring wells installed
 - Soil, groundwater, surface water, and sediment samples collected and analyzed
- Evaluated data from previous investigations
 - Additional data were needed to completely characterize the Site, so RI field investigations were needed.
 - Information and data from these previous investigations were used in planning the RI field program and used in the RI Report.

Building 82 RI Field Program

- Soil Investigation - to define contaminant nature, extent & migration and evaluate geology
- Groundwater Investigation - to define the contaminant nature, extent & migration; and evaluate groundwater flow
- Surface Water/Sediment Investigation - to define contaminant nature and extent and assess migration pathways to surface water/sediment

Soil Investigation

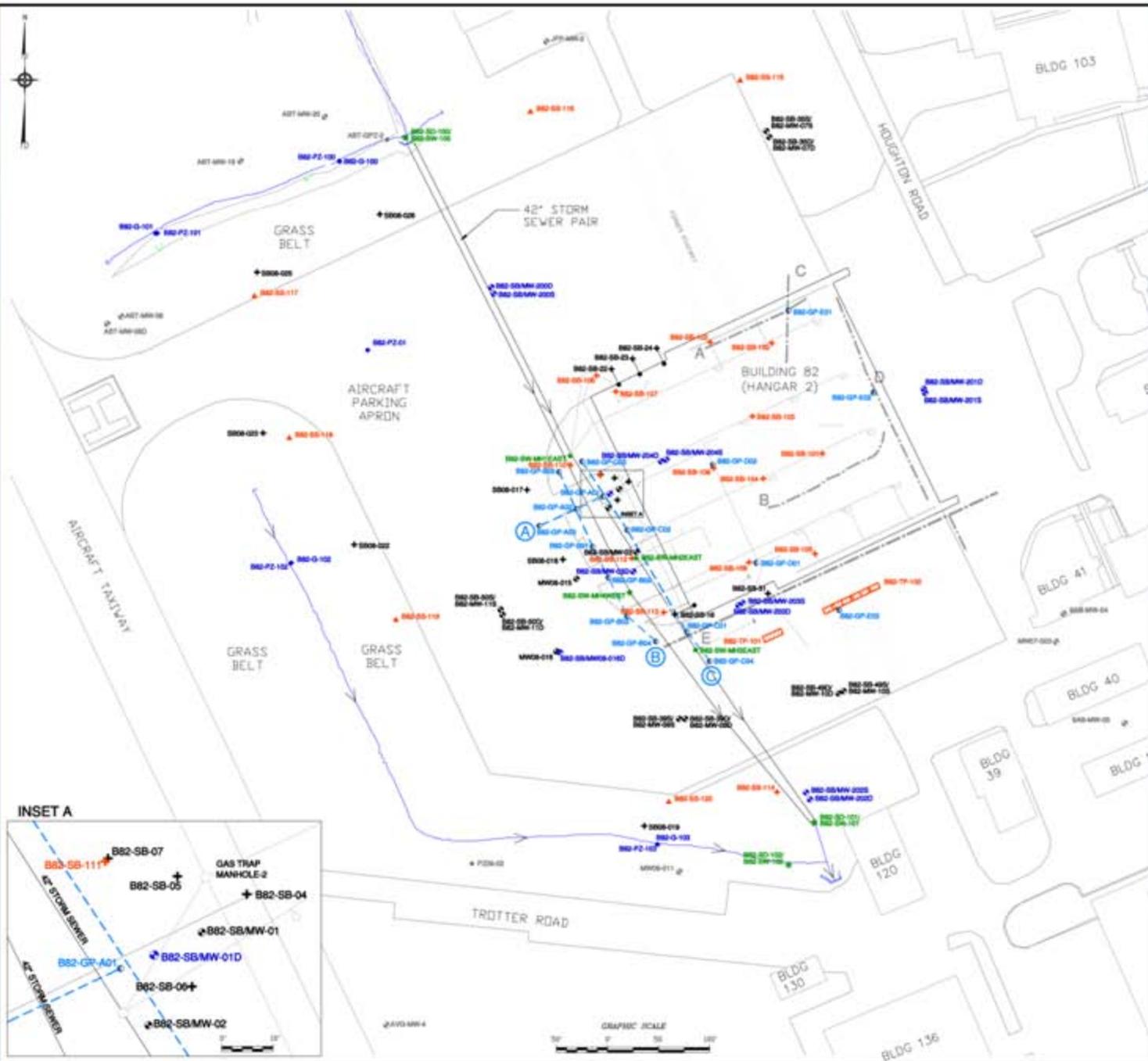
- Surface Soil Sampling and Analysis
- Subsurface Soil Borings
 - Initial DPT borings to evaluate potential source areas and determine locations for groundwater investigation
 - Borings for monitoring well installation
 - Samples for chemical analysis & evaluation of geology
 - Coring to confirm bedrock depth and characteristics
- Test Pits
 - Evaluate former roadway/utility corridor
 - Samples for chemical analysis

Groundwater Investigation

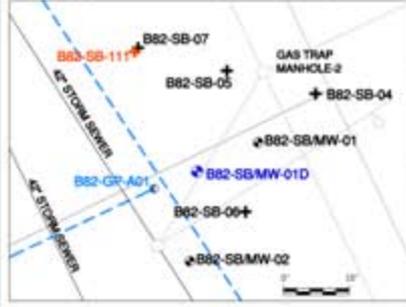
- Groundwater Profiling
 - Rapid sampling and analysis of gw from many points to find contamination and determine best locations for permanent wells
- Well Installation and Development
- Groundwater Sampling and Analysis
- Hydraulic Conductivity Testing
- Water Level Measurements

Surface Water/Sediment Investigation

- Surface Water Sampling and Analysis
 - Drainage ditches
 - Storm drains that cross the Site
- Sediment Sampling And Analysis
 - Drainage ditches
- Staff gauge/stream piezometer installation
 - To evaluate groundwater/surface water interaction



INSET A



DPT Soil Boring on Apron



DPT Soil Boring in Hangar



Overburden Drilling on Apron



Drilling in Hangar



Test Pit Excavation



Test Pit Excavation



Data Analyses and Evaluation

- Analyzed surface and subsurface soil, groundwater, surface water, sediment samples for: VOCs, SVOCs, pesticides & PCBs & metals.
- Validated all data.
- Evaluated and screened data against risk-based screening criteria, Base background values, drinking water MCLs.

Contaminant Presence

- VOCS – Infrequent detections at generally low concentrations in soil and groundwater, even fewer detections in surface water.
- SVOCs (mainly PAHs) – Widely detected and at highest concentrations in exposed surface soil and sediment, fewer detections in surface water and groundwater.
- Pesticides – Generally infrequent detections at low concentrations in all media.
- PCBs – Infrequent detections in all media, highest concentrations in deep groundwater.
- Metals – Frequent detections in all media, most below Base background values.

Potential Source Areas

■ On-Site Sources

- VOCs, SVOCs – release of fuels and solvents from floor drain system (GTM-2 & Drain D5)
- PAHs – exhaust from aircraft operating at Site
- PCBs in GW – past leaching from drainage ditch

■ Off-Site Sources

- Northeast of Site – MTBE & PCBs in groundwater
- East-Southeast of Site (Building 81?) – TCE in groundwater

■ Background Sources

- Pesticides – regular use of pesticides on & off Base
- Metals – naturally occurring

Human Health Risk Assessment COPCs

- Surface Soil: 5 SVOCs, 3 metals
- Subsurface Soil: 6 SVOCs, 1 PCB, 5 metals
- Groundwater: 8 VOCs, 4 SVOCs, 2 pesticides, 2 PCBs, 3 metals
- Surface Water: 2 metals
- Sediment: 3 metals, 5 SVOCs, 1 PCB
- Indoor air: 4 VOCs, 1 SVOC, 1 metal

Human Health Risk Assessment Conclusions

Receptors Evaluated	Did risks exceed regulatory thresholds?	
	Cancer Risks	Non-Cancer Risks
Current Site Use Scenarios		
Maintenance Worker	No	No
Trespasser	No	No
Future Site Use Scenarios		
On-site Resident	Yes	Yes
Trespasser	No	No
Recreational Visitors	No	No
Construction Worker	No	Yes
Commercial/Industrial Worker	No	No

Human Health Risk Assessment COCs

Future Resident - Groundwater as drinking water

- VOCs: TCE, benzene
- SVOCs: n-nitroso-di-n-propylamine
- Pesticides/PCBs: heptachlor epoxide, gamma chlordane, total PCBs
- Metals: arsenic, manganese, vanadium

Future Construction Worker – Trench air and soil

- SVOCs: naphthalene (volatilizing into air from groundwater in trench)
- Metals: manganese

Ecological Risk Assessment COPCs

- Surface Soil: 2 VOCs, 21 SVOCs, 8 pesticides, 1 PCB, 8 metals
- Sediment : 1 VOC, 22 SVOCs, 4 pesticides, 1 PCB, 6 metals
- Surface Water : 3 VOCs, 2 SVOCs, 6 metals

Ecological Risk Assessment Conclusions

Receptors Evaluated	Did risks exceed regulatory thresholds?
Terrestrial Receptors	
Invertebrates	No
Plants	No
Wildlife	No
Aquatic Receptors (in sediment)	
Invertebrates	No
Aquatic Organisms	No

Conclusions

- Contaminants detected in all media, but generally detected infrequently and at low concentrations
- More widespread presence of PAHs in exposed surface soil and sediment and metals in all media
- Potential risks to human health mainly from
 - Residential use of groundwater as drinking water
 - Future construction worker exposure during excavation
- No ecological impacts.
- Feasibility study needed to evaluate remedial alternatives.

Next Steps

- Draft RI Report issued November 6, 2007
- EPA and MassDEP beginning review of the document
- Final RI Report scheduled for April 2008
- Draft Feasibility Study expected in May 2008