SMART-SITE
Cost Efficiencies in Remedial Action Operations and Long-Term Monitoring

Southern Division, Naval Facilities Engineering Command

Science Applications International Corporation (SAIC)

Technology Information

- **Five-phase approach designed to ensure that the remedial program is optimized with respect to performance and costs**
  - Phase One: Needs Assessment
  - Phase Two: Implementation Plan
  - Phase Three: Pilot Project
  - Phase Four: Performance Optimization and Evaluation
  - Phase Five: Scaled-up Implementation

Technology Information

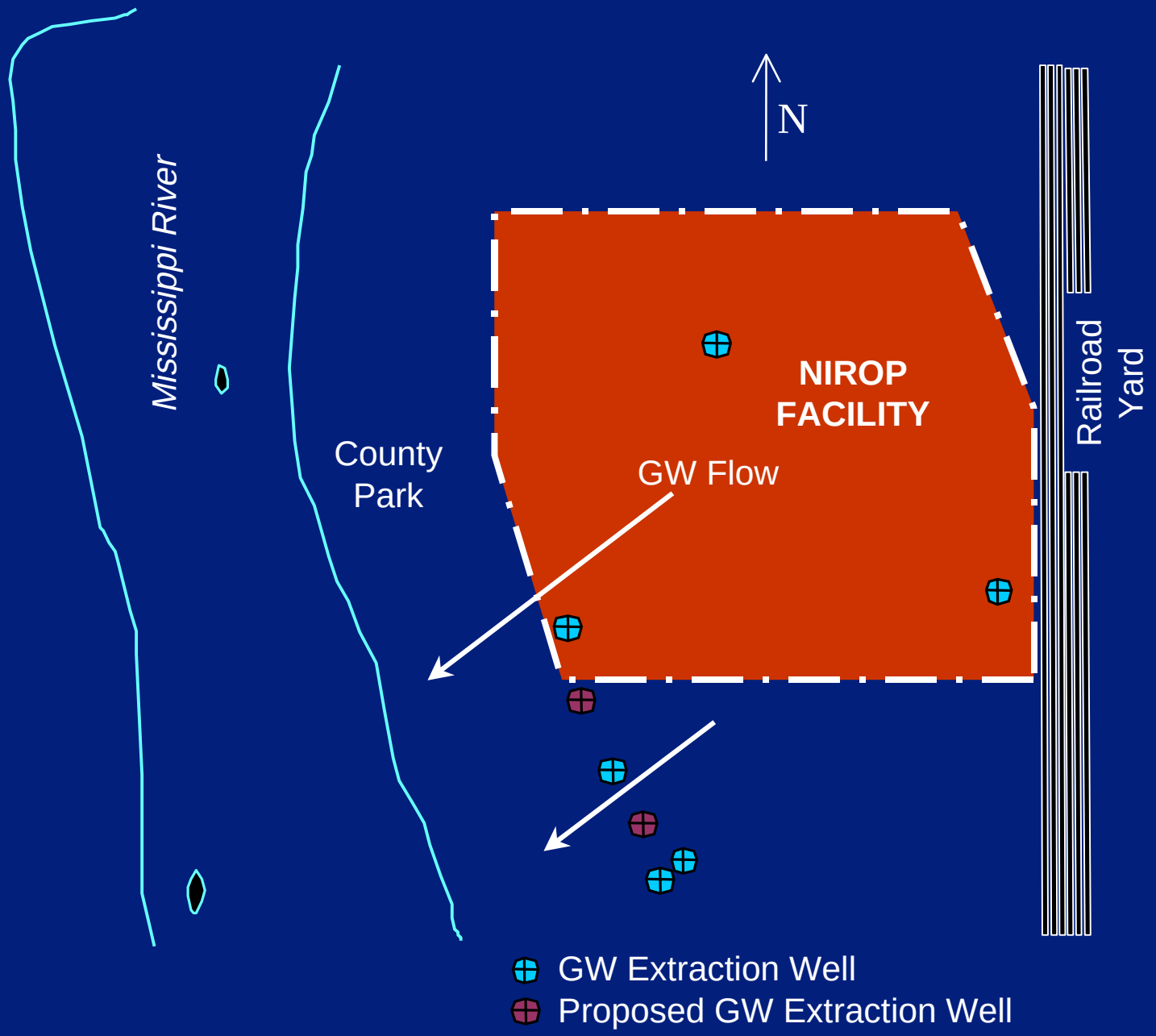
- **Phase One: Needs Assessment**
  - Applying engineering knowledge to optimize program including:
    - Process automation
    - Information management
    - Alternative remediation technologies
    - Good engineering practices
    - Proactive regulatory approaches
    - Performance-based metrics

Technology Information

- **Objectives of Needs Assessment:**
  - Evaluate present technology and strategy, design, and O&M program
  - Evaluate modifications of current remedial program activities to reduce short- and long-term costs
  - Make specific recommendations for improvements to the system or operations

Site Information

- **Naval Industrial Reserve Ordnance Plant (NIROP), Fridley, MN**
  - 138-acre site (80 government, 58 contractor)
  - 1,000 feet from the Mississippi River
  - Chemical releases associated with historical manufacturing and waste handling activities
  - TCE and other chlorinated solvent contamination
  - Unconsolidated aquifer, groundwater flowrate 100 to 200 feet per year
  - Contaminated outfall less than one mile upstream from City of Minneapolis water supply intake
  - Possible sources of contamination still present on site


N
Mississippi River
County
Park
NIROP
FACILITY
GW Flow
Railroad
Yard
GW Extraction Well
Proposed GW Extraction Well

PICTURE – FACILITY

Contracting Approach

- Innovative methodology or “intellectual technology” (BAA not just for “technologies”)
- Flexible payment method (four installments after completion of each of four tasks on fixed price contract)

Technology Application

- **Current remedial program**
  - Groundwater extraction and hydraulic containment – 6 extraction wells
  - Phase I: discharge to sanitary sewer, treatment at wastewater treatment facility
  - Phase II (under construction): groundwater treatment facility for long-term treatment of contaminated groundwater
    - Extraction and feed system
    - Air stripping with 4 tray aerators
    - Chemical cleaning and anti-scale polymer injection
    - Effluent discharge to Mississippi River under NPDES permit

Technology Application

- **Future Remedial Action Considerations:**
  - Contractor operating entire site
  - Need for remote operations, control, and monitoring
  - Possible expansion of system to treat other sources of contamination

Review Background Information

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Perform Initial Identification/Evaluation of Major Program Elements

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Conduct Field Evaluation of Program Elements

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Develop Initial Listing and Evaluation of Potential Cost Savings Alternatives

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Finalize Listing of Potential Cost Savings Alternatives

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Complete Financial Analyses for Each Alternative

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Rank Alternatives Based on Value and ROI

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Develop a Plan for Final Evaluation and Implementation of High Ranked Alternatives

Technology Application

- **Process**
  - Background information review
    - Annual monitoring report
    - O&M manuals
    - Unpublished information from conversations with RPM
  - Site evaluation
    - Observation of remedial program
    - Acquisition of additional records
    - Conversations with facility personnel
  - Remedial program evaluation
    - 8 program elements identified and evaluated

Technology Application

- **Process (continued)**
  - Identification and analysis of cost-reduction alternatives
    - Categorized as substitutions, optimizations, or automations
    - Ranked based on cost avoidance and return on investment (ROI)
  - Summary and recommendations
    - Life-cycle cost avoidance (20 years) of $3,240,000
    - Approximately 20% of currently projected system costs

Recommendation	Estimated Yearly Avoidance
Well Field Upgrade	$74,610
Bypass to Sanitary Sewer	1,850
Gravity Discharge to Storm Sewer	16,425
Influent and Effluent Pump Upgrades	7,876
Optimize Operations and Maintenance	2,830
Streamline Sampling and Monitoring Program	26,600
Wellhead Monitoring Upgrade	15,400
SCADA Upgrade and Automated Reporting	16,500
Total Yearly Cost Avoidance	**$162,091**

Revelations

- **Advantages**
  - Potential to save cost on long-term remedial action operations and system monitoring
  - Uses latest technologies to optimize system performance
  - Ideal for sites with older RODs, complex technologies, long-term liability, and increasing costs
  - Inexpensive
  - May be applied before or after operations begin
- **Disadvantages**
  - Existing system may already be optimized or may require complete replacement to increase efficiency

Revelations: Cost

Task 1:	Project Initiation/Background Information Review: Kickoff Meeting Initial Data Review Finalization of Work Plan	$	6,800
Task 2:	Site Evaluation: Entry Briefing/Initial Facility Tour Detailed Review of Facility Records Detailed Systems Inspection Initial Data Evaluation Exit Debrief	$	14,300
Task 3:	Performance and Cost Evaluation and Identification of Cost Reduction Alternatives: Performance Evaluation Cost Evaluation	$	10,300
Task 4:	Reporting Progress Reports Site Evaluation Report Draft and Final Project Reports	$	8,500
	TOTAL PROJECT COST	$	39,900

Revelations

- **Regulatory Issues**
  - May have to renegotiate RODs in order to realize significant benefits
  - Some alternatives may not be feasible in certain regulatory climates
  - Proactive approach may be favorably looked upon by regulators and community
- **Lessons Learned**
  - Good rapport with site personnel is a must for quality recommendations

Points of Contact

- **Remedial Project Manager**
  - (803) 820-5587, DSN 583-5587
- **Contracting Officer's Technical Representative**
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