Phased Approach - Minimize Costs/Maximize Return

STEP 1: Conduct Needs Assessment to Baseline Current Program
- Reality Check - Redefine program strategies and objectives
- Review existing program information
- Perform site visit
- Evaluate engineering systems, procedures, organization, information management/reporting, compliance issues, cost drivers…
- Identify opportunities for improvement
- Evaluate optimization alternatives
- Perform cost/benefit analysis
- Develop optimization recommendations

STEP 2: Develop Long-Term Optimization and Management Plan

STEP 3: Begin Implementation of Highest Ranked Alternatives

STEP 4: Evaluate Results Against Performance Metrics

STEP 5: Adjust Program and Implement Additional Alternatives

SAIC SmartSite SYSTEMS OPTIMIZATION

Standardized Data Collection Modules

- Background Information
- System Summary
- Labor
- Maintenance and Repair Management
- Transfer Equipment (pumps, blowers, etc.)
- Instrumentation (inputs)
- Control System
- Controlling Devices (outputs)
- SCADA and Operator Interface
- Management Systems
- Detailed Cost Data
- Monitoring
- Well and Trench Systems
- Specific Problems/Desired Improvements

SAIC SmartSite SYSTEMS OPTIMIZATION

Example Data Collection Module

Module 1—BACKGROUND INFORMATION	Page _1_ of _2_
Facility / Site Name: Vineland Chemical Co. Superfund Site	
	Inspector: R. Cronce

A. Facility	B. Location
Vineland Chemical Co. Superfund Site	1405 N. Mill Rd. Vineland, NJ 08360 Cumberland Co.

C. Key Contacts:

Name and Title	Address	Contact Information
Dave Herwig Program Manager	Vineland Chemical 1405 N. Mill Rd. Vineland, NJ 08360	Phone: 856-690-1758 Fax: 856-690-1759 E-Mail: daherwig@voicenet.com
Steve Gillespie Site Manager	Vineland Chemical 1405 N. Mill Rd. Vineland, NJ 08360	Phone: 856-690-1758 Fax: 856-690-1759 E-Mail: vinelandi@voicenet.com
Chuck Van Winkle - Plant Superintendent/Head Operator	Vineland Chemical 1405 N. Mill Rd. Vineland, NJ 08360	Phone: 856-690-1758 Fax: 856-690-1759 E-Mail:
Bill Stappenfenne Maintenance Supervisor	Vineland Chemical 1405 N. Mill Rd. Vineland, NJ 08360	Phone: Fax: E-Mail:
Matthew Westgate Geologist/Project Manager	U.S. EPA, Region II Emergency/Remedial Response Div. 290 Broadway - 19th Floor New York, NY 10007-1866	Phone: (212) 637-4422 Fax: (212) 637-4422 E-Mail: westgate.matthew@epamail.epa.gov
Martin Connolly, Project Engineer	USACE Philadelphia District Vineland Project Office 1509 North Mill Rd. Vineland, NJ 08360	Phone: (856) 794-9925 Fax: (856) 794-9828 E-Mail: Martin.J.Connolly@nap02.us

D. General Notes (Facility mission, history, risk issues, land use, political issues, etc.):

Site soil and groundwater impacted by arsenic related to historical production of organic arcenical herbicides and fungicides since 1949. No. 42 on NPL list. RI/FS completed in 1988. Contaminants of concern are primarily organic (mono and di-methyl arsenic) and inorganic arsenic. Approximately 1 M gpd of groundwater is captured by 13 groundwater extraction wells. Treatment consists of chemical treatment by oxidation, coagulation, sedimentation, filtration, and precipitation. Treated water is discharged to Blackwater Branch under a NPDES permit.

Example Life Cycle Cost Analysis Backup Table

Col #	Current Labor Costs Category	Crew	Description of Work	Rate ($/hr)	total hours	Unit Cost	Units per year	Annual Cost
1	Operations	1	Pumping of well vaults - 2 persons, 1 day per week	35.00	16	$ 560.00	52	$ 29,120.00
	Operations	1	Note: Cost savings related to more efficient repair of flow meters are accounted	35.00		$ -		$ -
	Monitoring		for in Section 3.11, and savings due to reduced cleaning of discharge lines	35.00		$ -		$ -
	Admin.		are included in section 3.4	65.00		$ -		$ -
	Engineering			65.00		$ -		$ -
	SubTotal				16.0	$ 560.00		$ 29,120.00

Col #	Current Cost of Operations - Equipment and Subcontracts Category				Unit Cost	Units per year	Annual Cost
1	Analytical						$ -
	Subcontracts		Sludge disposal - 3 ft/wk X 52 wks X 8.14lb		$ 22.00	1	$ 22.00
	Utilities						$ -
	Chemicals						$ -
	Equipment						$ -
	Materials						$ -
	Supplies		Misc - Sump pump, truck, etc.		$ 10.00	52	$ 520.00
	SubTotal				$ 32.00		$ 542.00

Col #	Proposed Operations Labor Costs Category	Crew	Description of Work	Rate ($/hr)	total hours	Unit Cost	Units per year	Annual Cost
3	Operations	1	Periodic pumping of well vaults - 2 persons, 1 day per month	35.00	16	$ 560.00	12	$ 6,720.00
	Maintenance			35.00		$ -		$ -
	Monitoring			35.00		$ -		$ -
	Admin.			65.00		$ -		$ -
	Engineering			65.00		$ -		$ -
	SubTotal				16.0	$ 560.00		$ 6,720.00

Example Life Cycle Costing Analysis Summary Table

Life of the facility in years =	30	Date Prepared:	02-Aug-01
Discount Factor in percent =	6%	Prepared by:	R. Cronce

Project: Vineland Chemical

Alternative Name: Evaluation of Well Vault Monitoring and Maintenance

Description of Alternative: Site grading for surface water control.
Sealing of interior vault seams.
Replacement of concrete covers with lighter doors.

Cost Category	Column 1 Est. Cost of Current Operations (Annual) Note 1	Column 2 PW of Current Operations Note 2	Column 3 Est. Cost of Proposed Operations (Annual)	Column 4 Capital Cost of Proposed Alternative	Column 5 PW of Proposed Operations Note 3	Column 6 Annual Operating Cost Savings (Col. 1 - Col. 3)	Column 7 Potential R O I (Years) (Col.4 / Col.1)	Column 8 Potential Life Cycle Savings (Col. 2 - Col. 5)
Labor Operations	$ 29,120.00	$ 400,831.88	$ 6,720.00	$ 11,200.00	$ 103,699.67	$ 22,400.00		$ 297,132.22
Maintenance	$ -	$ -	$ -	$ -	$ -	$ -		$ -
Monitoring	$ -	$ -	$ -	$ -	$ -	$ -		$ -
Administration	$ -	$ -	$ -	$ -	$ -	$ -		$ -
Engineering	$ -	$ -	$ -	$ 520.00	$ 520.00	$ -		($ 520.00)
Analytical	$ -	$ -	$ -	$ -	$ -	$ -		$ -
Subcontract	$ 22.00	$ 302.83	$ -	$ -	$ -	$ 22.00		$ 302.83
Utility	$ -	$ -	$ -	$ -	$ -	$ -		$ -
Chemicals	$ -	$ -	$ -	$ -	$ -	$ -		$ -
Equipment	$ -	$ -	$ -	$ -	$ -	$ -		$ -
Materials	$ -	$ -	$ -	$ 20,000.00	$ 20,000.00	$ -		$ (20,000.00)
Supplies	$ 520.00	$ 7,157.71	$ 120.00	$ 500.00	$ 2,151.78	$ 400.00		$ 5,005.93
		$ -			$ -	$ -		$ -
Totals	$ 29,662.00	$ 408,292.42	$ 6,840.00	$ 32,220.00	$ 126,371.45	$ 22,822.00	1.41	$ 281,920.98

Note 1: Based on present estimated annual costs impacted by this alternative only.
Note 2: The present worth of annual costs are based on a facility life and discount factor listed above. PW Factor = 13.76483115

Example Summary of Alternatives Cost Analysis

Program Element	Alternative Evaluated	Initial Cost	Annual Cost Savings	Life-Cycle Savings[1]	Return on Investment (years)
Well Field Management for Flow Maximization	Redevelop 14 RW's, reconstruct RW-9, and hydrogeologic testing of two RW's	$173,000	N/A	$1,765,950	N/A
Fouling of Groundwater Extraction Pumps	Addition of automated sequestering agent system.	$36,000	($43,538)	($635,293)	(0.8)
Performance of Groundwater Influent Lines	New transfer main	$288,360	$19,360	$69,000	15
Well Vault Monitoring and Maintenance	Replace covers, seal vaults, and grade area.	$32,200	$22,822	$281,920	1.4
Hydraulic Capacity of the Treatment Plant	Add level control for coagulation tanks	$7,040	$550	$500	12.9
Performance Enhancement Through Flow Equalization	Addition of equalization tank system	$156,500	$51,300	$549,635	3.0
Chemical Usage Rates	Optimization of current protocols, eliminate second organic train, chemical elimination, and addition of polishing unit.	$296,093	$337,068	$4,343,585	0.9
Performance of DAF Units	Modify discharge pipe weir and add internal sludge collection pipes.	$25,660	$24,500	$311,647	1
Performance of Chemical and Polymer Feed Pumps	Replace existing pumps and add two new chemical dilution stations.	$25,000	$4,300	$34,200	5.8
Performance of Flow Meters	Replace well flow meters with magnetic	$27,300	$10,920	$123,012	2.5
Compressed Air System	Add third compressor.	$15,600	$1,875	$10,195	8.3
Sludge Dewatering and Management	Replace centrifuges with filter presses	$280,500	$96,300	$1,045,400	2.9
Installation of MOVs in Chemical Storage Facility	Install motor operators on valves	$64,175	$315	$0	>30
SCADA System – Well Field Control and Operations Monitoring	Implement SCADA well field control and monitoring	$45,660	$6,370	$42,022	7.2
SCADA System – Treatment Plant Control and Operations Monitoring	Implement integrated plant control and monitoring	$104,200	$28,600	$289,474	3.6
SCADA System – Operator SCADA Control of Chemical Feed Rates	Integrate chemical feed rate control into PLC	$50,000	$25,662	$303,233	2.0
PLC and VFD Maintenance and Obsolescence	Perform VFD survey and substitution design	$6,200	$0	$0	N/A
Environmental Monitoring – Well Field Monitoring	Optimize sampling frequency and install dedicated sampling pumps	$124,500	$63,440	$748,741	2.0
Environmental Monitoring – Treatment Plant Monitoring	Reduce frequency of two off-site sampling parameters.	$19,500	$11,720	$141,824	1.7
Data Management and Reporting	No opportunities for improvement identified	N/A	N/A	N/A	N/A
TOTAL		**$1,296,873**	**$657,778**	**$9,696,354**	**1.05**