JASPER & HART CREOSOTE SUPERFUND SITES SOURCE and GROUNDWATER PLUMES

Value Engineering Study
For
U.S. Environmental Protection Agency
Region 6

Study Date: July 10-12, 2007
Report
August 30, 2007

US Army
Corps of Engineers

US Environmental
Protection Agency

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APPENDICES

EXECUTIVE SUMMARY

General

The VE Studies are based on the principals and standards used in the Value Engineering (VE) Study process consisting of six phases. The EPA VE process is broken into two components, the screening phase that addresses the first four phases (Information Gathering, Function Analysis, Speculation, Analysis) and the study phase that encompasses the final two phases (Development and Presentation). A VE process studies the functions of individual items of a project and the relationships of those functions to the overall function of the project. The result of studying the functions in this way allows the team to take a critical look at how these functions are being met and then develop alternative ways to achieve the same function while increasing the value and maintaining the primary function of the project. In the end, it is hoped that the project will realize a reduction in cost, increase or maintain the execution of the primary function, and improve or maintain the bidability, constructability and maintainability of the completed operable unit thereby improving the site environment.

Summary of VE Study Results

During the speculation phase of this study, 49 creative ideas were identified. Seven of these ideas were developed into VE recommendations with cost implications where applicable. Fourteen ideas were developed into design comments.

The following table presents a summary of the ideas that were developed into recommendations and cost addressed where considered feasible. Cost is an important issue for comparison of VE recommendations. The estimates provided should be of sufficient detail to allow a decision regarding implementation, but the estimates should not be used to compute actual savings associated with adoption of any one recommendation.

In addition to the Summary of Recommendations, one idea was developed that was not viable. This developed recommendation is included in Appendix F as "Withdrawn Recommendation". This is included in the report to document the logic of why the recommendation was withdrawn.

SUMMARY OF RECOMMENDATIONS

REC # NUMBER	DESCRIPTION	POTENTIAL SAVINGS (COST)
1	Use single wall carrier pipe instead of dual wall pipe for groundwater conveyance.	$93,000
2	Excavate ponds A and E at Hart Creosote and use it as a holding pond for unnamed creek water so flow can be detained during excavation of sediments.	($11,785)

REC # NUMBER	DESCRIPTION	POTENTIAL SAVINGS (COST)
3	Consider 40 mil geomembrane vs. 60 mil geomembrane for cover system.	$36,600
4	Delay the lamella purchase at the Hart Site; leave space adjacent to the treatment plant and make provisions to include all appropriate connection points, chemical feed requirements, power and etc at the facility should it be deemed necessary to add it later.	$212,000
5	Use 3-strand barbed wire fencing around the Hart RCRA Vault (landfill) vs. 6' high chain link security fence.	$55,440
6	Eliminate geotextile in infiltration trench.	$298

Value Engineering Screening Study Team Members

NAME	**ORGANIZATION**
Ken True	CVS, Contractor
Lindsey Lien	USACE-HTRW CX
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Curtis Payton	USACE
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Implementation of Study Recommendations

The EPA RPM is requested to prepare a short written response for the record that explains reasons for accepting or rejecting each VE recommendation (or task a contractor or the project designer to prepare such a response), and send this written response to Greg Mellema, USACE VE Coordinator.

NOTICE
Application of Results of this Value Engineering Study

This VE Study constitutes a review of 30% design documents. As with all VE studies, the design documents are reviewed using VE principles in an effort to improve the overall value and worth. Numerous recommendations for changes and design comments have resulted from this VE effort. The team believes these end results add to the overall value and goals of this project. However, this effort does not in any way constitute or imply approval, consent, or acceptance of the preliminary draft design documents by any of the team members or the organizations that they represent. Nor does acceptance of any of the recommendations and design comments imply that the design documents are therefore approved. It is the team's position that incorporation of the recommendations and design comments into the design documents would potentially aid in the approval process.

Certification
This is to verify that the Value Engineering Screening Study was conducted in accordance with standard Value Engineering principles and practices.

Kenneth True, PE, CVS
Value Engineering Screening Study Team Leader

SECTION 1 – INTRODUCTION

This report documents the results of "the VE Study", for both the Jasper Creosoting Company (Jasper) and the Hart Creosoting Company (Hart) Superfund Sites, located in Jasper, Texas. The VE Study was conducted at the Holiday Inn conference room in Jasper Texas on July 10-12, 2007. The sites were visited the morning of July 10th. The study team was from the USACE HTRW Center of Expertise and other USACE offices, the EPA RPM, and the design firm CH2M Hill . The VE study was facilitated by Kenneth True, a Certified Value Specialist (CVS) and Professional Engineer. The names and telephone numbers of all participants in the study are listed in Appendix A.

The Job Plan

This study followed the basic VE methodology as endorsed by Society of American Value Engineers (SAVE) International, the professional organization of Value Engineering. This report does not include any detailed explanations of the value engineering/value analysis processes used during the workshop in development of the results presented herein. A summary of the basic processes used in the study are included to give the reader an idea of the standard VE methodology, consisting of six phases:

Information Phase: The Team studied the current 65% Design documents, Basis of Design Report, the Record of Decision (ROD), portions of the Remedial Investigation and Feasibility Study, EPA criteria documents, figures, descriptions of project work, and the current cost estimate to fully understand the project scope and required functions. This phase was largely done by the team prior to the on site portion of the VE Study.

Function Analysis Phase: The purpose of this phase is to clearly identify the function(s) of the project, and to formulate a concept from which new directions can be taken. A Function Analysis Study Technique (FAST) Diagram is an end product of the Functional Analysis Phase. The FAST Diagram is included in Appendix C.

Speculation Phase: The CVS led the Team brainstorming sessions to generate ideas that could potentially be beneficial to the remedial action. All team members contributed ideas and critical analysis of the ideas was discouraged until the Analysis Phase (see Appendix B).

Analysis Phase: Evaluation, testing, and critical analysis of all ideas generated during speculation was performed to determine potential for savings or improvement to the site remediation. Ideas that did not survive critical analysis were deleted. Those feasible ideas that survive the analysis phase are then developed into recommendations. Those surviving ideas were assigned to members of the team for further development and validation of the merit of the recommendation. Sometimes this attempt to substantiate the recommendation results in the modification or even elimination of the original idea.

Development Phase: Usually during a full VE Study more research and in-depth resolution is pursued with the entire group present to substantiate an idea. The ideas were developed enough on site to determine that they were worthy of implementation. After returning to their individual offices, the VE Study Team Members completed development of the surviving ideas into written recommendations. Recommendation descriptions, along with technical support documentation, and cost estimates were prepared to support implementation of ideas. Development generally takes the form of a written document that clearly expresses the proposed idea, with a "Before" and "After" depiction. In addition, the VE Study Team identified items of interest as Comments that were not developed as recommendations. These comments follow the study recommendations.

Presentation Phase: This portion of the study was done in a short summary of the recommendations on the afternoon of July 12, 2007 by each member who authored a recommendation to the remainder of the team. The recommendations were in draft form at the time of the presentation. This report will be distributed for review by EPA to project supporters and decision makers. The EPA will determine responsibilities for implementation of accepted recommendations.

This study differs slightly from a “standard” VE study. The differences lie in the applications of some of the methodologies and the way they can be applied to an ongoing HTRW Superfund site that has numerous operable units in order to achieve the desired end result. Also, the time the team spent together was considerably decreased in part to attempt to reduce costs, save or accommodate team members’ schedules and/or other obligations. The recommendations were initially developed during the July 10-12 meeting, and completed when team members returned to their offices. In any case, the results should be considered as completion of a Value Engineering Study for this site.

Boundary of the Study

This study was performed for both the Jasper Creosoting Company (Jasper) and the Hart Creosoting Company (Hart) Superfund Sites, Jasper Texas. The study evaluated the proposed remediation as identified in the 65% design documents as prepared by CH2M Hill. There were no other boundaries for this study other than the Remedial Action contract is scheduled for award FY 2007.

Ideas and Recommendations

Part of the VE methodology is to generate as many ideas as is practical, evaluate each idea, and then select as candidates for further development only those ideas that offer added value to the project. If an idea thus selected, turns out to work in the manner expected, that idea is put forth as a formal VE recommendation. Recommendations represent only those ideas that are proven to the VE team’s satisfaction.

Comments

Some ideas that did not make the selection for development as recommendations were nevertheless judged worthy of further consideration. These ideas have been written up as Design Comments and are included in Section 4.

Level of Development

VE Studies are working sessions for the purpose of developing and recommending alternative approaches to a given project. As such, the results and recommendations presented are of a conceptual nature, and are not intended as a final design. Detailed feasibility assessment and final design development of any of the recommendations presented herein, should they be accepted, remain the responsibility of the EPA.

SECTION 2 – PROJECT DESCRIPTION

Background

This report presents the results of the VE Study performed for both the Jasper Creosoting Company (Jasper) and the Hart Creosoting Company (Hart) Superfund Sites, located in Jasper, Texas. A VE study is intended to add value to projects, in terms of improved quality, enhanced construction methods, reduction in waste volume generated, or money expended on the remediation process. This VE Study was funded as part of a pilot program funded by HQ EPA, and coordinated by EPA Region 6 and the USACE HTRW-CX.

Authority for the performance of these studies is contained in the Office of Solid Waste and Emergency Response (OSWER) Directive OSWER 9335.5-24, Value Engineering for Fund Financed Remedial Design and Remedial Action Projects, signed on 14 April, 2006. This directive provides guidance concerning requirements addressing Value Engineering for Superfund Remedial Design and Remedial Action Projects.

Project Description (Jasper)

The Jasper Creosoting Company (JCC) Site is a former wood treating facility located at 601 North McQueen Street in Jasper, Texas. The Site measures 11.3 acres and is bounded on the east by the Burlington Northern-Santa Fe (BNSF) railroad tracks, to the west by North McQueen Street, on the south by Highway 776, and to the north by the inactive Louisiana Pacific Lumber Facility. The Site is located 1 mile northeast of downtown Jasper in a predominantly wooded area with mixed industrial, commercial, and residential land use. The major features of the Site are: the upland area including the former process area, a newly constructed RCRA landfill, the drainage ditch located east of the Site, and the wetland area located east of the railroad tracks.

Wood treatment operations were performed at the Site between 1946 and 1986, using a steam preconditioning and pressurized creosote and pentachlorophenol (PCP) process. Potential contaminant sources present at the Site, following abandonment in 1992, included a drip pad, deteriorating ASTs, contaminated treatment cylinders, wastewater holding tanks (impoundments), filter boxes, cooling towers (heat exchanger), storage containers, an incinerator, and contaminated soil associated with spills and leaks.

In 1996, EPA initiated a time-critical removal action. This action included removal of the existing buildings/structures, ASTs, other facility equipment, and contaminated soil. Scrap creosote-treated wood, heavily contaminated onsite soil, and liquid wastes from tanks and containers were sent offsite for disposal. Other less-contaminated soil was stockpiled onsite in a temporary waste cell. Between November 1999 and January 2000, EPA conducted another removal action to mitigate threats posed by the Site conditions. The removal action included site stabilization, removal of creosote-soaked lumber, removal and offsite disposal of liquid from an exposed pipe leading out of the waste cell.

A time-critical removal action was conducted between July 7, 2005 and March 1, 2006 to implement components of the Selected Remedy for contaminated soil and sediment as described in the ROD, which was signed in September 2006. During the EPA time-critical removal action, the soil and sediment Preliminary Remediation Goals (PRG) exceedences identified in the waste cell, the former process area, the drainage ditch, and the wetland water inlet area were completely removed and disposed into an onsite RCRA Containment Cell (RCC) that was designed to meet the RCRA Subtitle C landfill requirements.

This VE Study focused on the selected remedy for contaminated ground water, which includes the installation of a NAPL recovery system to remove the free phase and residual NAPL identified at the Site; and monitoring ground water quality to evaluate the effectiveness of the RCC. The main components of the ground water remedy are NAPL recovery through vertical extraction wells, an on site treatment system to separate the NAPL from ground water, and injection of treated ground water via infiltration trenches at a location up-gradient of the NAPL recovery wells to promote flushing of the residual NAPL. In addition, two extraction wells are planned to be installed in the PRG exceedence area to hydraulically contain COCs (Chemicals of Concern) to prevent plume expansion and to minimize the migration of the COCs from ground water to surface water (Sandy Creek).

Estimate of Costs (Jasper)

According to the cost estimate provided in the ROD, the total capital construction costs for the ground water component and the hydraulic containment system are approximately $2,379,000 and $517,000 respectively, for a total of $2,896,000.

The total projected present worth (for 30 years, 7% discount rate) for the ground water component and the hydraulic containment system is approximately $5,681,000 and $2,304,000 respectively, for a total of $7,985,000.

Background (Hart)

The Hart Creosoting Company (Hart) Site is a former wood treating facility located on the west side of State Highway 96, approximately 1 mile south of Jasper, Texas. The HCC Site is approximately 23.4-acres in size and is bounded by densely forested, private property (Temple Inland) to the south and west, commercial property to the north and State Highway 96 to the east. An un-named tributary flows along the west-southwest Site boundary, converging with Big Walnut Run Creek approximately 1 mile south of the Site.

Wood treatment operations, which used a steam preconditioning and pressurized creosote process, began in 1958 and ended in May 1993. Between 1958 and 1977, creosote waste from treatment operations was managed in six unlined surface impoundments (ponds). Around 1977, these ponds were reconfigured into four ponds (Pond A, B, C and D/E) and used until November 1985. Potential contaminant sources present at the Site, following its abandonment in 1993, included the drip pad, deteriorating aboveground storage tanks (ASTs), contaminated treatment cylinders, wastewater holding tanks, cooling towers (heat exchanger), treated wood storage areas, and contaminated soil and ground water associated with historic spills and waste management practices.

In 1995, EPA performed a time-critical removal action to drain the four ponds and stabilize the remaining sludge. Sludge and visibly contaminated soil were consolidated and placed in an onsite, natural clay-lined temporary Waste Cell (WC). A clay cover was placed over the cell and seeded with grass for erosion control.

This VE Study focused on the 30% Design submittal (July 2007), prepared by EPA's RAC Contractor, to address the following components of selected remedy as set forth in the ROD, signed in September 2006:

- Removing contaminated surface water and treating the contaminated surface water to meet the Texas Surface Water Quality Standards and/or surface water PRGs prior to discharge.
- Excavating soil and sediment containing chemicals of concern (COCs) at concentrations exceeding the PRGs and disposing the excavated soil/sediment into RCC.
- Implementing institutional controls (ICs) for the Site to restrict the future use of the Site to commercial/ industrial land use.
- Installing a NAPL recovery system to remove free phase and residual NAPL from the saturated zone to the extent practicable.
- Applying a Technical Impracticability (TI) waiver to waive the MCLs and or ground water PRGs and define a TI zone (TIZ) for the contaminated ground water.
- Establish a plume management zone (PMZ) encompassing the TIZ to prevent ground water development. The PMZ will assure that future ground water pumping does not mobilize contaminants beyond the TIZ.
- Implementing ICs for the TIZ and PMZ to restrict future ground water use.
- Implementing a ground water monitoring program to evaluate natural attenuation of the COCs and to verify that the contaminated ground water is managed within the PMZ.

Estimate of Costs (Hart)

According to the cost estimate provided in the ROD, the total capital construction costs for the contaminated soil/sediment, contaminated ground water, and implementation and operation of the hydraulic containment systems are approximately $7,684,000, $1,926,000, and $618,000 respectively, for a total of $10,228,000.

The total projected present worth (30 years, 7% discount rate) for the contaminated soil/sediment, contaminated ground water, and implementation and operation of the hydraulic containment systems is approximately $8,117,000, $5,310,000, and $2,911,000 respectively, for a total of $16,338,000.

SECTION 3 – VE RECOMMENDATIONS

Organization of Recommendations

This section contains the complete documentation of all recommendations resulting from this study. Each recommendation has been marked with a unique identification number. The parent idea, or ideas from which the recommendation began, can be determined from the Creative Idea List located in Appendix B of this report. For tracking purposes, the original idea numbers that make up a recommendation are shown within the recommendation.

Each recommendation is documented by a separate write-up that includes a description of both the original design and recommended change, a list of advantages and disadvantages, sketches where appropriate, calculations, cost estimate, and the economic impact of the recommendation on the first cost, and where applicable, the life cycle cost. The economic impact is shown in terms of savings or added cost.

VALUE ENGINEERING RECOMMENDATION # 1

PROJECT: JASPER/HART CREOSOTE SITES
LOCATION: JASPER TX
STUDY DATE: July 10-12, 2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Use single wall carrier pipe instead of dual wall pipe for groundwater conveyance.

Creative Idea 2

ORIGINAL DESIGN:

Typical installation of subsurface piping carrying contaminated material use dual wall pipe with the carrier pipe acting as secondary containment and also as leak detection when release is detected in the sump typically associated with a containment pipe.

RECOMMENDED CHANGE:

Utilize direct bury single wall pipe between wells and treatment plant.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$118,200		
RECOMMENDED DESIGN	$25,200		
ESTIMATED SAVINGS OR (COST)	$93,000		

VALUE ENGINEERING RECOMMENDATION # 1

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
Hart – Dual Wall Piping	LF	$32	ROD	600	$19,200		
Jasper – Dual Wall Piping	LF	$32	ROD	1600	$51,200		
Subtotal					$70,400		
Hart – Single Wall	LF	$6.35	Means			600	$3,800
Jasper –Single Wall	LF	$6.35	Means			1600	$10,200
Subtotal							$14,000
Mark-Up Multiplier		1.68	ROD		$47,900		$11,200
Total					$118,300		$25,200

ADVANTAGES:

- Ease of construction
- Reduced material and labor costs.

DISADVANTAGES:

- Violates RCRA requirement to dual wall all buried pipes not available to inspection.
- Limited leak detection capability.

JUSTIFICATION:

While dual wall containment is typically required for contaminated water conveyance, elimination of dual wall piping at the Jasper and Hart sites pose no risk of spreading contamination as the piping runs are all within the area of contamination. In addition, all of the piping runs at the Hart site are contained within the Superfund Site. Proper construction inspection during installation and pressure testing post installation will ensure that there are no leaks in the pipe at the time it is put into service. The short duration the pipe is expected to be in service significantly reduces the potential for leaks to develop other than those caused by physical damage during excavation. Leaks caused under those circumstances would probably not be prevented by dual wall pipe as both pipes would be impacted by heavy equipment intrusions.

VALUE ENGINEERING RECOMMENDATION # 2

PROJECT: JASPER/HART CREOSOTE SITES
LOCATION: JASPER TX
STUDY DATE: July 10-12, 2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Excavate pond A at Hart Creosote and use as a holding pond for unnamed creek water and to eliminate stream flow surges during excavation of stream sediments.

Creative Idea 6

ORIGINAL DESIGN:

No initial design exists for excavation of sediments at this time. Suggestions have been made for installation of weirs to modify stream flow with water pumped from blocked off sections of the stream, treated in a skid unit and pumped around the work area.

RECOMMENDED CHANGE:

Excavate Pond A at Hart Creosote and use it as a holding pond for unnamed creek water so flow surges can be contained during excavation of stream sediments. Water could be discharged to the stream at night via pumping so not to exceed stream capacity. Surface discharge beyond the area of excavation could be used to maintain storage capacity during the workday. Cutoff needs to occur prior to contaminated zone to eliminate need to treat prior to discharge.

Leave excavated pond E available as a storm water sump during the excavation of the base of the landfill to facilitate collection and removal of stormwater.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	0		
RECOMMENDED DESIGN	(11,785)		
ESTIMATED SAVINGS OR (COST)	(11,785)		

VALUE ENGINEERING RECOMMENDATION # 2

Cost build up: 9 days total excavation time

5 inch pump rental with hose and fuel to evacuate pond daily: $350 plus 2 hr/day maintenance labor at $50/hr. 9x $450/day = $4,050 for pumping task per event

Excavate inlet trench, estimate 250 ft long, one bucket wide (4 ft) and an average 5 ft deep = 185 bank cy. Max digging time est. at 4.5 hrs x 80/hr operator + $85/hr for a Cat 330B excavator. $7,425 excavation cost. Note: this may actually be offset by the cost required to build and remove temporary weirs or coffer dams during stream excavation.

Backfill trench with compaction by tracking. 2 hrs D-6 dozer rental with fuel @ $75/hr = $150 Operator 2 hr @ $80/h= $160 total $310 for task

TOTAL COST FOR POND USE $11,785

ADVANTAGES:

- Reduces or eliminates excavation through the water column which reduces or eliminates the mobilization of contaminated sediments in the stream.
- Lowers the degree of saturation in the excavated material and collateral water "excavated" with the sediments.
- If design is made so that the stream is totally bypassed through the detention basin at all times, it could provide surge capacity for flood flows and reduce velocity.
- Interception of water before the work area eliminates the need for treating the water.

DISADVANTAGES:

- Need to phase excavation of pond A to precede excavation of stream.
- Flood flows could damage bypass channels.
- If pond E is used as a sump, it dictates the sequence of landfill excavation and the geometry of the landfill bottom grade.

JUSTIFICATION:

The use of excavated pond areas for storm water retention during stream excavation may reduce or eliminate the need for the use of cofferdams while excavating stream sediments. Upstream cofferdams may be required to store normal flows in the stream channel. Storing water above the excavated reaches will simplify construction and reduce water handling within the forested area and help maintain stream capacity during large storm events.

VALUE ENGINEERING RECOMMENDATION # 3

PROJECT: JASPER/HART CREOSOTE SITES
LOCATION: JASPER TX
STUDY DATE: July 10-12, 2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Consider 40 mil geomembrane vs. 60 mil geomembrane for cover system.

Creative Idea 29

ORIGINAL DESIGN:

Original Design utilizes a 60-mil geomembrane in the RCRA Cover for the primary barrier layer.

RECOMMENDED CHANGE:

Utilize a 40-mil geomembrane for the primary barrier layer in the RCRA Cover System.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$157,600 (ROD)	0	
RECOMMENDED DESIGN	$121,000	0	
ESTIMATED SAVINGS OR (COST)	$36,600	0	

VALUE ENGINEERING RECOMMENDATION # 3

ADVANTAGES:

- Lower material cost.
- Still meets requirements established in 40 CFR 264.310 (a).

DISADVANTAGES:

- Precedent set at the Jasper RCRA cell, which utilizes 60 mil geomembrane in the cover system.
- When obtaining materials from the supplier, would need to check on availability of two separate materials in lieu of one.
- Not as robust a material as a 60 mil geomembrane.

JUSTIFICATION:

Forty mil geomembranes have been used successfully for numerous cover systems at hazardous waste storage facilities. Typically, the minimum thickness required for a hazardous waste cover system is 30 mils. According to Dr. Robert Koerner, director of the Geosynthetic Research Institute, a 40 mil geomembrane is rated very high for installation survivability. 40 CFR 264.310 requires that the permeability of the cover system be less than or equal to the permeability of the liner system to prevent the "bathtub" effect. Infiltration rates through a geomembrane material itself are negligible. The primary mechanisms of leakage through a geomembrane cover system are through seam defects, holes, or tears that may be present. Good construction quality assurance practices are required to minimize installation defects for both 40 mil and 60 mil geomembrane installations.

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
60 mil geomembrane	SY	$8	ROD	19,700	$157,600		
40 mil geomembrane	SY	$6.14	RACER			19,700	$121,000
Total					$157,600		$121,000

VALUE ENGINEERING RECOMMENDATION # 4

PROJECT: Jasper and Hart Superfund Sites
LOCATION: Jasper, TX
STUDY DATE: July 10-12, 2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Delay the lamella purchase at the Hart Site, leave space adjacent to the treatment plant and make provisions to include all appropriate connection points, chemical feed requirements, power and etc at the facility should it be deemed necessary to add it later.

Creative Idea 45

ORIGINAL DESIGN:

The original designs for the groundwater pump and treat portions of the ROD specified remedial action included provisions for a lamella type clarifier preceded the EQ tank, at the Hart Ground Water treatment plant.

RECOMMENDED CHANGE:

Provide the pad, plumbing connections, outlets for chemical feeds, power but delay the purchase of the lamella unit until it is determined the free product loading to the plant exceeds the capability of the clay media and GAC treatment train components. Should the process unit be needed later, it could be easily added.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$212,000		
RECOMMENDED DESIGN	$0		
ESTIMATED SAVINGS OR (COST)	$212,000		

VALUE ENGINEERING RECOMMENDATION # 4

ADVANTAGES:

- Simplifies Plant Operations.
- Reduces the amount of plant labor expended.
- Eliminates residual disposal requirements (sediment and oil).
- Frees up additional funds for other contingencies.
- A long lead item, allows added flexibility to the schedule.

DISADVANTAGES:

- May potentially be needed later.
- May require modification to the operations if free phase is encountered.
- Could increase Carbon and Clay change out frequencies.

JUSTIFICATION:

The current data available is inconclusive concerning the presence or absence of DNAPL present in the ground water projected for treatment at the Hart Treatment Plant. Historically designers have been conservative in installing free phase removal technologies in situations where there is a chance of free product only to learn the free phase did not materialize. Rather than invest in an expensive, long procurement lead time piece of equipment, the team agreed to provide facilities for the inclusion of the unit at a later date should it be needed, but not to purchase the unit until it was certain it was needed.

Cost based on AE Quote	$126,000
Markups from ROD (68%)	$ 86,000
Total	$212,000

VALUE ENGINEERING RECOMMENDATION # 5

PROJECT: Hart Superfund Site
LOCATION: Jasper, TX
STUDY DATE: July 10-12, 2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Use 3-strand barbed wire fencing around the Hart RCRA Vault (landfill) vs. 6' high chain link security fence.

Creative Idea 46

ORIGINAL DESIGN:

As stated in the Preliminary Design Criteria Report, a six-foot high chain link fence will be installed around the perimeter of the RCRA Vault (landfill).

RECOMMENDED CHANGE:

Utilize a 3-strand barbed wire fence around the RCRA Vault (landfill).

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$70,400		
RECOMMENDED DESIGN	$14,960		
ESTIMATED SAVINGS OR (COST)	$55,440		

VALUE ENGINEERING RECOMMENDATION # 5

ADVANTAGES:

- Lower material cost.
- Faster installation.
- Still outlines RCRA Vault boundary.
- Minimizes O&M for fence repair.

DISADVANTAGES:

- Lower security.

JUSTIFICATION:

The installation of a 3-stand barbed wire fence was utilized around the RCRA Vault at the Jasper SF Site. To date, vandalism or unauthorized access has not been a problem at the Jasper Site. It is envisioned that a similar level of site security is warranted for the RCRA Vault to be installed at the Hart SF Site. This will result in savings for both cost and schedule at the project.

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
FE-6 Security Fence	LF	$40.00	MII*	1760	$70,400		
3 Strand Barbed Wire Fence	LF	$8.50	MII			1760	$14,960
Total					$70,400		$14,960

*MII (M-CACES second generation, fully loaded construction costs, w/o contingency or SIOH)

VALUE ENGINEERING RECOMMENDATION # 6

PROJECT: Jasper and Hart Superfund Sites
LOCATION: Jasper, TX
STUDY DATE: July 10-12, 2007

DESCRIPTIVE TITLE OF RECOMMENDATION:
Eliminate geotextile in infiltration trench.

Creative Idea 47

ORIGINAL DESIGN:

Original Design calls for excavation of infiltration trenches at each site and placement of a geotextile fabric at the base of each trench followed by coarse grained material (crushed limestone ¾ screen). CH2MHill estimates that Jasper will have a total trench length of 350 feet and Hart will have a total length of 750 feet. At 1.5 feet wide, using a complete-wrap design the textile will surround the gravel and have a perimeter of 1.5+2.5+1.5+2.5 = 8 (feet). Therefore approximately 8800 square feet of geotextile will be required to line the trenches with a width of about 8 feet.
Fabric / 0.5 ft / pipe / 2ft / fabric (fabric on the sides as well – see illustration below)

RECOMMENDED CHANGE:

Install crushed limestone at the base of each trench with delivery piping on top of the material and covered by the crushed limestone. Therefore approximately 2200 square feet of geotextile will be required to line the trenches with a width of about 2 feet.
Excavated base / 0.5 ft / pipe / 2 ft / fabric.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$1,430		
RECOMMENDED DESIGN	$1,132		
ESTIMATED SAVINGS OR (COST)	$298		

No labor costs are included in this analysis because they likely are not significant

VALUE ENGINEERING RECOMMENDATION # 6

ADVANTAGES:

- Quicker trench materials installation.
- May decrease holding time of water in trench.

DISADVANTAGES:

- Roll cutting necessitated by non-burrito style may offset other labor savings unless the mfr. sends the material in rolls of 2-ft wide. Silting from the sides of the trench.
- Increases potential for silting from sides of trench.

SCHEDULE EFFCTS:

- Slightly decreases time for trench installation.

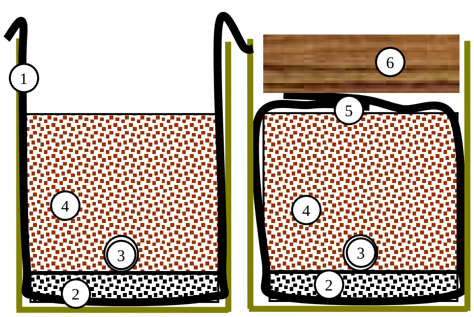
JUSTIFICATION:

Based on the risk of infiltration of silt into the gravel and the limited cost savings this recommendation is of very limited financial value.

REFERENCES:

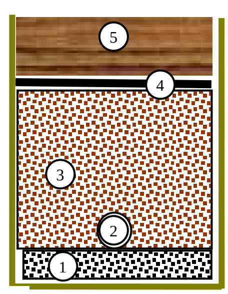
CH2MHill 2007. *Final Focused Feasibility Study Report for Bountiful/Woods Cross 5th South PCE Plume (OU2) Davis County, Utah*. Camp Dresser & McKee Federal Programs Corporation (CDM). June 2007.

Illustration:



Original Design:

Fabric installed initially (1) followed by fill gravel (2) then pipe placement (3) and cover fill gravel (4). Finish by folding over fabric (5) and placing general fill (6).



Proposed Change:

Fill gravel (1) pipe placement (2) and cover fill gravel (3). Finish by placing fabric over gravel (4) and placing general fill (5).

SECTION 4 - DESIGN COMMENTS

DESIGN COMMENTS	
ID # CMT #	**Design Comment / Description**
3	Leave ample annular space in the casing under the railroad at Jasper site for additional piping needs that may be identified in the future. This approach allows flexibility in accommodating conveyances that might be added to enhance or upgrade existing design. If, after a review period, additional conveyances are proposed, then the infrastructure would already be in place.
7	For the Hart Site, in the event coffer dams are utilized to isolate sections of the stream during excavation, consider whether water collected from those areas can be treated in a skid mounted GAC unit and discharged to the surface for overland infiltration. Discharging to the surface will reduce the need to pump back to the treatment plant, which may not be complete at the time of stream excavation, and reduce the need for sufficient hose to get around the work area. Surface discharge also avoids any potential regulatory or public perception issues related to discharge to surface water, and prevents the potential for scour and release of sediments at the pump discharge point.
12	Consider using clean soil from the top of the cap as backfill for ponds A & E. This approach may allow for a better cut-fill balance for earthwork. In addition, if the ponds are excavated before the landfill cell is constructed, it creates a place for removed soil (from the existing cap) to be placed.
13	The presence of a relatively constant surface water elevation in Jasper Creosote Pond D/E during an extended drought period following the June 2004 remedial investigation, and no obvious points of surface water inflow and outflow, suggests a potential connection to ground water bearing Zone P2. The design should consider and provide for a contingency in the event Pond D/E refills during construction due to ground water inflow. Recommendation. Although five recently drilled soil borings advanced through the temporary waste cell to depths of 16 to 20 feet revealed no obvious saturated intervals at depths comparable to Pond D/E's depth, it is recommended that the design/bid documents not specify a quantity of surface water to be removed. Rather, it's proposed that the design/bid document specify that the Contractor dewater Pond D/E as necessary to allow for removal of contaminated sediments and excavation of the RCRA containment cell (RCC) footprint. The description of the subsurface conditions at the Hart site should indicate a potential for the pond to refill following the initial dewatering due to direct precipitation or ground water inflow.
16	Recommend the EPA Region 8 RPM coordinate and solidify the scope of work that Temple Inland will accomplish related to timber clearing, grubbing and possible road construction during those efforts as soon as possible. This will allow the remedial

DESIGN COMMENTS	
ID # CMT #	**Design Comment / Description**
	action contract documents to include provisions for accomplishing work efforts during the RA that Temple Inland chooses not to do for the EPA, or are unable to accomplish within the time frame needed for the intermittent creek sediment excavation.
18	Consider purchasing equipment/geotextiles ASAP (especially long lead items), as part of the preconstruction step. Advantages: • Ordering equipment prior to NTP eliminates the potential for project delays due to equipment/material having to be manufactured after receipt of order from the installation contractor (subsequent to NTP). Installation can begin immediately upon mobilization to the site. • Eliminates the "middle-man" markup – bottom line it's cheaper for the client. • Eliminates submittal requirements and project time delays inherent with the process. Eliminates discussions and time-consuming submittal transfers related to interpretations of "or approved equivalent." You get the equipment you wrote the spec for. • Contractor has the equipment on site and can physically decide what will be entailed with the installation (regarding equipment) rather than interpreting cut sheet data. <u>Disadvantages:</u> • Storage of equipment/materials if delivered prior to NTP and Contractor mob to the site - lack of a "guarded" laydown yard. • Requires an outlay of cash prior to the RA being funded.
19	Explore cost of reserving yellow iron and labor in advance. <u>Advantages:</u> • Prevents problems with obtaining heavy equipment at a "remote" location. • Availability is ensured at NTP. Given the need for a minimum of 4 mid-size excavators and 6 off-road dump trucks it may require mobilizing equipment from several vendor locations (if only one vendor is to be used). Reserving up front provides the time to do so. • Reduction of mobilization costs. • Provides ability to stipulate the type/size equipment being used by sub rather than depending on sub to meet excavation schedule with equipment he has or is able to lease. Tendency is to attempt with as little equipment as possible and let the schedule slide. <u>Disadvantages:</u> • Will require an outlay of cash likely before the RA is funded (at risk). • Don't know whether corporate structure will allow for doing so – that being

DESIGN COMMENTS	
ID # CMT #	**Design Comment / Description**
	both providing at-risk funds for reservation of equipment, and leasing the equipment to a subcontractor. • FAR may not allow, need to check. • Earthmoving sub ultimately contracted with may have sufficient equipment wherein leased equipment is not necessary – client is out the reservation funds.
20	Based on lessons learned from the Jasper RCRA Vault, it is recommended that the leachate sump piping have a smooth lined interior. The Jasper RCRA Vault design utilized corrugated HDPE piping, and it has been found that it is difficult to slide a pump or other monitoring equipment down the slope into the sumps. A smooth lined interior will facilitate the ability to slide instrumentation or pumps down into the sumps.
25	Consider deletion of the requirement for a test pad for the liner and/or cover system. The Hart RCRA Vault will be nearly identical to the Jasper RCRA Vault; most likely utilizing the same borrow sources for clay and same geosynthetic materials. Construction techniques will also be very similar. It is suggested to review construction documentation of the Jasper RCRA Vault and determine if the test pads will be required to properly install the Hart RCRA Vault. The purpose of a test pad is basically to verify that the construction methods used will be adequate to meet compaction, density, and moisture requirements for the clay layers and that geosynthetic materials are not damaged by the equipment. If the test pads are determined not necessary, there would be some cost savings and time savings realized during construction.
30	Recommend that the haul road next to the intermittent un-named creek be constructed and stabilized based on current conditions, rather than require the use of a geotextile for all areas. This will provide flexibility during construction and eliminate unnecessary materials.
38	The un-named tributary at the Hart Site is located in an area, owned by Temple Inland Timber Company, which is currently undeveloped. Excavation of the sediment PRG exceedances from the streambed will not reduce the flow capacity of the tributary; however, will result in altered flow conditions which will potentially increase bank erosion in the un-named tributary and increased sediment loading to the receiving Big Walnut Run Creek. It is recommended that the design consider and determine the best way to mitigate impacts of streambed excavation. This may involve backfilling the excavated bed along with a combination of temporary bank erosion control measures in select locations to reduce sloughing conditions. This may need to be determined in the field as construction progresses. Considerations: • It is likely that, based on the available sediment and groundwater data, residual

DESIGN COMMENTS	
ID # CMT #	**Design Comment / Description**
	NAPL in the tributary has migrated below vertical excavation limit (ground water table). Without backfilling of the excavation, the residual NAPL present below the excavation limit will be directly exposed to the environment and result in unacceptable human and ecological risk. • Surface water flow in the tributary is highly impacted by the bottom slope of the tributary. Without backfilling and erosion control of the excavation area, the surface water flow conditions will be altered. The changes on the surface water flow conditions will potentially increase sediment loading in the down stream Big Walnut Run Creek. • Consider the incorporation of "soft" stabilization into the cut banks and elsewhere in the channel to temporarily protect the channel during natural revegetation. This may be done by utilizing anchored portions of trees for bank protection in portions of the stream where lack of bank protection could lead to significant erosion. Some of the bends in the creek are quite severe and may have potential to wash out during high flow conditions. Not properly stabilizing the excavated channel bed and banks from erosion could result in upstream headcut development and continued stream bank sloughing. • Given the uncertainty in the effects of stream destabilization, it is recommended that the government consider the need for documented indemnification from the landowner (Temple) from any and all damage resulting from stream excavation and/or restoration prior to initiation of the project.
39	Consider using aluminum (Al) versus copper (Cu) conductors to reduce cost. The NAPL/ground water recovery and treatment system will utilize electric pumps with potential electrical service runs of up to 1500 feet required at the Jasper site from the treatment system building to the most distant downgradient recovery well. Upon review of this option, the CH2M HILL design engineer recommends we stay the course with copper wire for the following reasons: • On larger feeder conductors, Al is normally less costly, even when you have to increase the wire size. However, for smaller wire, such as that planned for these projects, it is not economical to use Al. Wire sizes will need to increase by at least one size to use Al for these projects. • Switches, receptacles etc. do not normally come with Al/Cu connections so special ones may need to be ordered. • Connections to motors can be a problem since Al wire is not as flexible. Vibration can tend to crack Al conductors. Al wire has greater expansion and contraction properties which may result in future disconnection problems. • For a short-term project, such as these, the Cu wire will have a salvage value

DESIGN COMMENTS	
ID # CMT #	**Design Comment / Description**
	when the project is decommissioned. The salvage value will more than offset the increased cost. The Al wire is not expected to have any salvage value.
40	Related to Recommendation #1, may consider the use of continuous Polyethylene butt welded pipe placed inside a carrier pipe also made of PE to function as a double walled pipe for areas requiring dual containment piping, in lieu of prefabricated sections of double walled piping. This two pipe system would be much less expensive, quicker to install and meet the intent of dual containment. One drawback of this type of piping system is the lack of fittings for connections to wells along a collector line. This may require installation of watertight manways, manholes or other access points where the piping could be joined and contain any leakage that might occur at these connection points.
43	Consider the use of Cement Wallboard versus CMU (concrete-masonry blocks) in Control Room Wall. The wall between the control room and ground water treatment area is currently designed to be constructed of CMU. The CH2M HILL design architect proposes that studs and impact-resistant gypsum board be used in conjunction with a concrete curb (8" tall). The impact-resistant gypsum board will provide some level of water resistance and if epoxy paint is applied it should provide equivalent moisture protection. This would be advantageous as it would eliminate the need for a mason on the project.

APPENDICES

The appendices in this report contain backup information supporting the body of the report, and the mechanics of the workshop. The following appendices are included.

CONTENTS

APPENDIX A
STUDY PARTICIPANTS

Attendees

JASPER & HART CREOSOTE SITES July 10-12, 2007

Name	Organization and Address (Organization first, with complete address underneath)	Tel # and FAX. (Tel first with FAX underneath)	Role in wk shop	Site Visit	Day 1	Day 2
Kenneth True	VE Contractor kentrue@maladon.com	402-339-1936 C 402-516-2635	Team Facilitator	X	X	X
Lindsey Lien	USACE, HTRW CX Lindsey.k.lien@usace.army.mil	402-697-2580	Project Coordinator	X	X	X
Yinghong He	CH2M Hill yhe@chzm.com	541-768-3514	Civil/ Environmental Eng.	X	X	X
Scott McKinley	CH2M Hill smckinle@chzm.com	541-768-3514	Hydrologist	X	X	X
Greg Mellema	USACE, HTRW CX gregory.j.mellema@usace.army.mil	402-697-2658	VE Team Member	X	X	X
John Hartley	USACE john.r.hartley@usace.army.mil	402-293-2523	VE Team Member	X	X	X
Curtis Payton	USACE curtis.payton@usace.army.mil	916-557-7431	VE Team Member	X	X	X
David Abshire	USEPA abshire.david@epa.gov	214-665-7188	Hydrologist	X	X	X
Mike Wilson	CH2M Hill michael.wilson@chzm.com	214-213-5773	Civil/CM	X	X	X
Bob Sullivan	USEPA R6 sullivan.robert@epa.gov	214-665-2223	RPM	X	X	X
Bill Faught	CH2M Hill bill.faught@chzm.com	713-462-2580	Project Manager	X	X	X

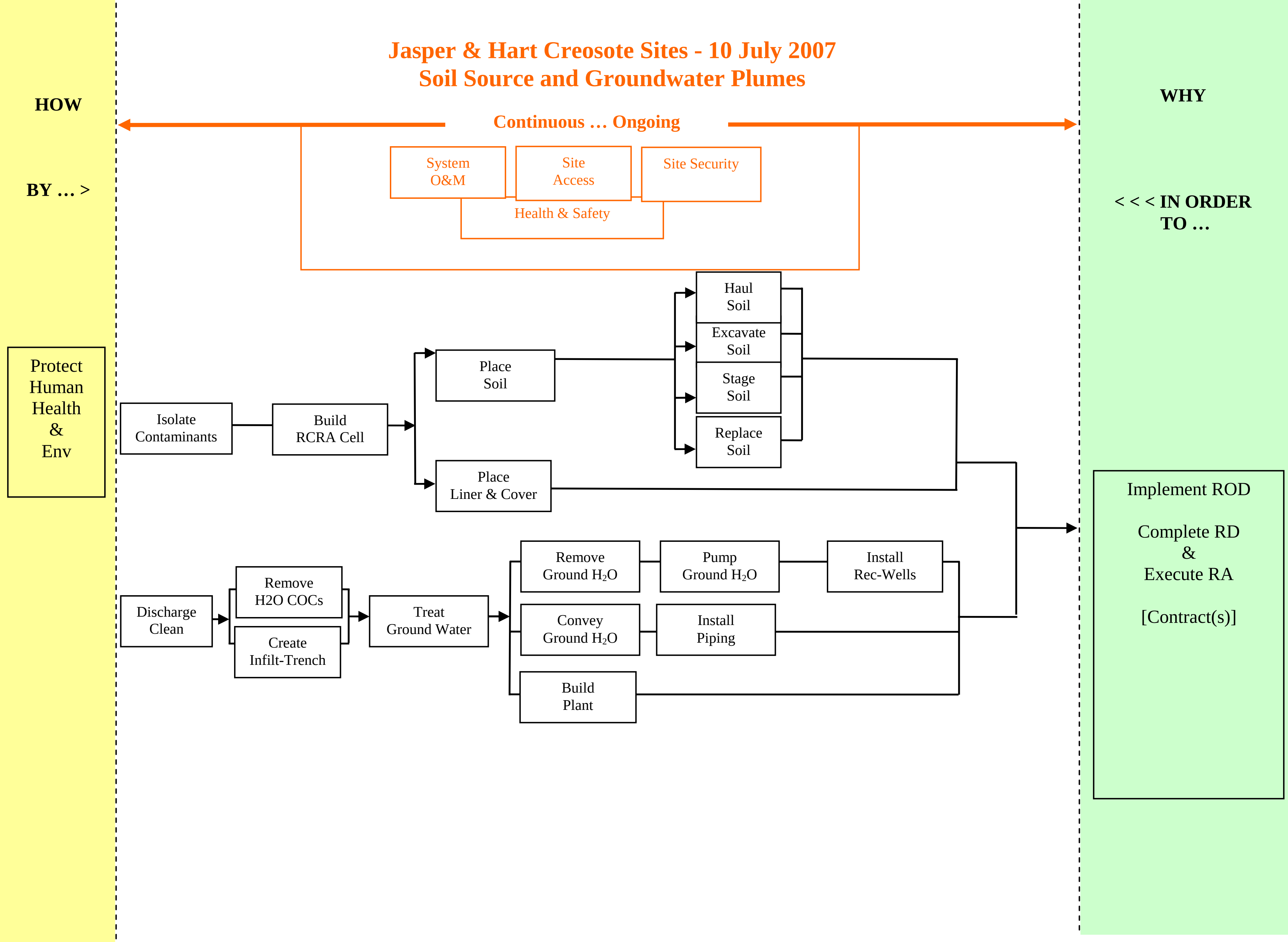
APPENDIX B
CREATIVE IDEAS LIST

ID #	Name of Idea / description	Value Potential
1	Consider Single Treatment System Train vs. Dual Train	WD
2	Use single wall piping in lieu of double wall piping	R
3	Leave ample annular space in casing under railroad for multiple pipes (reverse piping)	D/J
4	Assess LC cost for multiple trains vs. dual train or single	E
5	Use a GAC Cutoff Trench near Bridge near Hwy 776	E
6	Pre excavate ponds (A & E) for storm water detention areas, or stream diversion storage (temp EQ basin)	R/H
7	Overland flow of surface tributary water to remove sediment from channel segments during sediment removal activities (300' typical), coordinate with state	D/H
8	Install asphalt cap over Hart RCRA containment cell to reduce O&M	E
9	Put RCRA cap over the existing temporary Hart cell	E
10	Sequence the new cell construction at Hart so you can begin filling it prior to completion	E
11	Consider sequencing cell construction so the new RCRA cell is done prior to the excavation of the on site and creek sediments, to minimize the amount of double handling.	E
12	Consider using clean soil from the top of the cap as backfill for ponds A & E	D/H
13	Design/Construction needs to have contingency included in it if Pond E has a connection to groundwater and can not be dewatered.	D/H
14	Expedite the RA procurement	E
15	Schedule Rules over Money	E
16	Solidify scope of work that Temple Inland can do for us, see if they can start work ASAP – does that include timber clearing and grubbing.	D/H
17	Over Clear Area, to be sure we have adequate area cleared in advance.	Combine w/16
18	Consider purchasing equipment/geotextiles ASAP (especially long lead items), as part of the pre construction step	D combine w/21
19	Explore cost of reserving yellow iron and labor in advance of construction	D
20	Leachate Sump cleanouts and inspection ports should have smooth interior lining	D/H
21	Use performance specs for treatment equipment or three	Combine

ID #	Name of Idea / description	Value Potential
	vendors or equivalent	w/18
22	Increase number of designers to accomplish design quicker	E
23	Obligate ’07 money without actual award in ‘07	E
24	Contractor, buy equipment, depreciate, resell.	E
25	Delete test pad for liner or cap	D/H
26	Double shift landfill construction to assure completion	E
27	Double shift the creek excavation during dry periods	E
28	Consider using conveyor belts	E
29	Consider 40 mil liner vs. 60	R/H
30	Delete geotextile on the road next to the creek, use more rock	D/H combine w/31
31	Use dirt road near the creek	Combine w/30
32	Develop plan for load and unloading trucks (creek), frequency routes	E
33	Vacuum excavation for creek	E
34	Hydraulic mining (slurry-soil washing) for the creek excavation	E
35	Use small equipment in creek vs. large track hoe	E
36	Presample creek to determine extent of excavations	E
37	Use natural materials (plants) to stabilize portions of creek	E
38	Better define what is going to be done with backfill in the bottom slopes of the stream	D/H
39	Use aluminum conductors vs. copper	R
40	Use continuous pipe for inner pipe in dual containment piping vs. prefabricated	D
41	Co-locate water and bury electrical conduit(s) in the same trench	E
42	For two Jasper down gradient wells use a separate treatment system (GAC) for these wells 50 gpm, discharge to wetlands	E
43	Consider using cement wall board in control room in lieu of CMU	D
44	Delete bathroom in pumphouse, use porta john	E
45	Delay the lamella purchase, leave space and all appropriate	R/H

ID #	Name of Idea / description	Value Potential
	connection points at the facility to add it later	
46	Use 3 strand barbed wire around landfill vs. chain link	R/H
47	Eliminate geotextile in infiltration trench, use graded granular backfill	R/H
48	Limit seed and topsoil for areas outside boundaries of the cap (item 61 Gantt schedule)	E
49	Incorporate use of used equipment in the project	E

APPENDIX C
FUNCTION ANALYSIS SYSTEM TECHNIQUE (FAST) DIAGRAM


Jasper & Hart Creosote Sites - 10 July 2007
Soil Source and Groundwater Plumes
HOW
BY … >
WHY
< < < IN ORDER TO …
Continuous … Ongoing
System O&M
Site Access
Site Security
Health & Safety
Protect Human Health & Env
Isolate Contaminants
Build RCRA Cell
Place Soil
Place Liner & Cover
Haul Soil
Excavate Soil
Stage Soil
Replace Soil
Discharge Clean
Remove H2O COCs
Create Infilt-Trench
Treat Ground Water
Remove Ground H_2O
Pump Ground H_2O
Install Rec-Wells
Convey Ground H_2O
Install Piping
Build Plant
Implement ROD
Complete RD & Execute RA
[Contract(s)]

APPENDIX D
PHOTOGRAPHS

Jasper - Sandy Creek

Jasper - Sandy Creek Bridge

Jasper - Wetlands

Jasper - Cell & RR 1

Jasper - EW Location

Jasper - Rd for EWs

Hart - LF Sign

Hart - Mon Wells 1

Hart - Pond E

Hart - Pond E II

Hart - Unnamed Creek

Hart - Unnamed Creek II

APPENDIX E
ACRONYMS LIST

Acronyms List

°F	degrees Fahrenheit
µg / L	micrograms per liter
amsl	above mean sea level
ARARs	applicable or relevant and appropriate requirements
ASTM	American Society for Testing and Materials
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylene
CAH	chlorinated aliphatic hydrocarbons
CCE	Certified Cost Engineer
CCV	Continuing calibration verification
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
cis-DCE	cis-1,2, dichloroethene
CLP	Contract Laboratory Program
CM/ DAY	centimeters per day
cm/ sec	centimeter per second
COC	contaminant of concern also chemicals of concern
COPC	chemicals of potential concern
CPT	cone penetrometer technology
CVS	Certified Value Specialist
CWA	Clean Water Act
CX	center of expertise
DNAPL	dens non-aqueous phase liquid
DO	dissolved oxygen
DOE	U.S. Department of Energy
DPE	dual phase extraction
DPT	direct push technology
DQOs	data quality objectives
DW	domestic well
EAB	enhanced anaerobic bioremediation
ECD	electron capture detector
Eh	reduction/ oxidation potential
EPA	U.S. Environmental Protection Agency
FFS	focused feasibility study
FS	feasibility study
ft	feet
ft/ day	feet per day
ft^3	cubic feet
FWQC	Federal Water Quality Criteria
GAC	granulated activated carbon
gpm	gallons per minute
GPS	global positioning system
GRA	general response action
HTRW	Hazardous, Toxic and Radioactive Waste
in	inches
K	hydraulic conductivity
L	lower aquifer zone
LGAC	liquid granulated activated carbon
M	middle aquifer zone

MCL	maximum contaminant level
MCLG	maximum contaminant level goal
mg/ L	milligrams per liter
MIP	membrane interface probe
mL	milliliter
mm / yr	millimeters per year
MTBE	methyl tert-butyl ether
MW	monitoring well
NAPL	non-aqueous phase liquid
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
O&M	operation and maintenance
OU	operable unit
PA	preliminary assessment
PAC	powdered activated carbon
PCE	tetrachloroethene
PE	Professional Engineer
POTW	publicly owned treatment works
PP	proposed plan
ppb	parts per billion
PRB	permeable reactive barrier
PRP	potentially responsible party
PVC	polyvinyl chloride
RA	remedial action
RAO	remedial action objectives
RCRA	Resources Conservation and Recovery Act
RD	remedial design
RI	remedial investigation
ROD	record of decision
RPM	remedial program manager
SAP	sampling and analysis plan
SARA	Superfund Amendments and Reauthorization Act of 1986
scfm	standard cubic feet per minute
SDWA	Safe Drinking Water Act
SPME	solid phase micro extraction
SVE	soil vapor extraction
TBC	to be considered
TCE	trichloroethene
TMDL	total maximum daily load
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
UV	ultraviolet
VC	vinyl chloride
VE	Value Engineering
VGAC	vapor granulated activated carbon
VOC	volatile organic compound
WBZ	water bearing zone

APPENDIX F

Withdrawn Recommendation

WITHDRAWN VALUE ENGINEERING RECOMMENDATION

PROJECT: Jasper and Hart Superfund Sites
LOCATION: Jasper, TX
STUDY DATE: July 10-12, 2007

DESCRIPTIVE TITLE – RECOMMENDATION WITHDRAWN:
Consider Single Treatment System Train vs. Dual Train

Creative Idea Number 1

ORIGINAL DESIGN:

The original designs for the groundwater pump and treat portions of the ROD specified remedial action included provisions for dual treatment trains down stream of an equalization (EQ) tank (at Hart a lamella type clarifier preceded the EQ tank), each consisting of a cartridge filter unit, a single 4-foot diameter vessel containing clay adsorptive media, and two granular activated carbon (GAC) contactors (size unspecified assumed to be 4' diameter) in series which discharged into a common injection/backwash supply tank.

RECOMMENDED CHANGE:

Combine the clay media and GAC treatment train components into a single treatment train with adequate capacity to meet the required organic and hydraulic loadings at each of the sites. The proposed single treatment train would include redundant cartridge filters plumbed to operate in series or parallel. Bypass piping around all unit operations would be provided for flexibility. The same number of pumps as provided in the original design would be included for flexibility in flow except one pump would be rated for 100% flow and the two other pumps would be rated at 50% flow. All pumps would be outfitted variable/adjustable frequency drives to provide pumping rates in the range of 35 – 130 gpm using a single pump or 2-smaller pumps operating in parallel (for redundancy and flexibility).

This Recommendation is withdrawn. See Justification paragraph for reasons.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$2,015,900		
RECOMMENDED DESIGN	$1,192,608		
ESTIMATED SAVINGS OR (COST)	$823,292		

WITHDRAWN VALUE ENGINEERING RECOMMENDATION

ADVANTAGES:

- Smaller building needed.
- Greater flexibility in pretreatment through a dual cartridge filter system.
- Reduced operator time needed for a single train system.
- Reduced sampling frequency for Clay and GAC systems due to the larger mass present, and reduced number of treatment trains.
- Lower O&M Costs, carbon replacement costs for rented units include a “rental fee + placement fee” compared to Bulk GAC change-out costs.

DISADVANTAGES:

- Potentially less flexibility at low flows using larger diameter units.
- Carbon and Clay change outs using a single train may result in plant shut downs, or higher loadings to remaining units on line.
- Loss of redundancy in main treatment components.

JUSTIFICATION:

The current water treatment plant arrangement at both the Jasper and Hart sites were designed with the intention that the system should allow the greatest flexibility in operation; hence the inclusion of a dual train treatment system was proposed. A potentially more flexible design would encompass a single unit treatment train with variable frequency drive equipped pumps with a capacity over the range of 25% to 100% using a total of 3 pumps equipped with variable frequency drives with a capacity of 50 – 100 % of the rated pump capacity, (1-130 gpm pump and 2-65 gpm pumps). Channeling in the GAC vessels was a concern expressed by persons at the study as the primary factor contributing to their decision to implement a two train system. Conversations with Mark Stenzel, a product manager and applications expert at Calgon Carbon, refuted the concern expressed regarding channeling in the GAC units under low flow conditions. See also http://www.tigg.com/ACTIVATED-CARBON/blame-game.html by Wayne Schuliger applications engineering director at TIGG Corporation. The potential for channeling occurring was generally related to air binding caused by poor GAC bed preparation, or less frequently solids deposition as a result of poor pretreatment. Generally, the clay and GAC unit processes recommend a quality filter capable of removing particles 10 microns or larger be provided. Hence the recommendation for including dual cartridge filters to allow for uninterrupted operation during filter change outs. An alternative to cartridge units would be using bag filters if solids loading rates are such that the bag capacity is adequate to correspond to the frequency the operator normally visits the site.

The building sizes could be significantly reduced:

WITHDRAWN VALUE ENGINEERING RECOMMENDATION

Dimensions and calculations for the buildings were based on Drawing 1-M-01 357704, 31’x 84’ (2604 sf) for Jasper and 20-M-01 357715, 31’x 91’ (2820 sf) for Hart. Eliminating the second treatment train at Hart could narrow the building from 31’ to approximately 21’ x 71’ (1490 sf) and the 20’ x 31’ (620 sf) section of the Lamella treatment area could be simply placed on a pad. A more efficient 1500 sf building orientation might be a 30’ x 50’ structure. Reduction in cost based on information received at the VE study from the AE indicated a cost for the structure of approximately $110/sf. The resulting reduction in the building foot print from going to a single treatment train at the Hart Site is approximately (2820 – 1500) x $110 = $145,200. Added cost for the inclusion of a 600 sf pad for the Lamella type separator = 600 x $50 = $30,000 or a net savings of $115,000 at Hart. Similarly for the Jasper Site, the building foot print could be reduced from 84’ x 31’ (2604 sf) to 21’ x 72’ (1512 sf similar in size to Hart).
Savings from Jasper (2604 sf – 1512 sf) x $110/sf = $120,000. Total Building savings = $115,000 + 120,000 = $235,000.

Clay and Carbon unit sizes and replacement frequencies were based on expected adsorption capacities of an influent containing 8 mg/L of TPAH (Hart Design Basis Report-Jasper Basis not provided). Removal efficiencies of 90% (7.2 mg/L) in the clay and 100% (0.8 mg/L) in the GAC were estimated based on conversations with a Calgon Carbon Representative, and Biomin literature obtained from the company internet home page. Clay was assumed to adsorb 30% by weight and GAC 5% by weight (both conservative values). It was assumed the smaller GAC vessels in the 2 train systems would be rented units since the designers indicated the entire vessel including the GAC would be replaced when necessary. This was compared to purchasing a single pair of larger GAC units at each site and assuming the GAC would cost the same regardless which option was implemented, rent or buy.

Explanation for Withdrawing This Recommendation

This recommendation is included in the VE report as withdrawn. The team’s position at the time of the study was the disadvantages outweighed the advantages when the cost and schedule were considered. Scheduling required that the EPA RPM give the design firm design direction as of July 12 to enable the design to be completed on schedule. As of July 12, the information available indicated a savings in the $200,000 range and a potentially negative impact on the design schedule. Additionally, the designer thought that the redesign fees would reduce the savings. Subsequent information indicates the potential savings are considerably higher than $200,000. However the team agreed prior to leaving Jasper that this idea would be classified as withdrawn. Further consideration may be necessary to determine whether one or two treatment trains are the best value.

WITHDRAWN VALUE ENGINEERING RECOMMENDATION

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
Fdn & Bldg (Hart)	Sf	$110	AE E	2820	$310,200	1500*	$195,000
Fdn & Bldg (Jasper)	Sf	$110	AE E	2604	$286,440	1500	$165,000
(Hart)							
EQ Pumps + Spare	LS		AE E		$18,750		$18,750
Cartridge Filter	LS		AE E		$5,200		$5,200
Clay Filter	LS		AE E		$20,000		$10,000
Piping/Insulation	LS		AE E		$93,400		$75,600
Electrical	LS		AE E		$37,600		$27,000
Instrumentation/Controls	LS		AE E		$51,000		$40,500
(Jasper)							
EQ Pumps + Spare	LS		AE E		$18,750		$18,750
Cartridge Filter	LS		AE E		$5,200		$5,200
Clay Filter	LS		AE E		$20,000		$10,000
Piping/Insulation	LS		AE E		$93,400		$75,600
Subtotals					**$959,940**		**$646,600**
GAC Costs 2 trains							
GAC Rent Vessels	***mo***	***$500***	***V***	***(60x4)2***	***$240,000***		
GAC Buy Vessels	Ea	$9,600	V			8	$76,800
GAC Costs 1 train							
GAC Rent Vessels	mo	$975	V	(60x2)2	$234,000		
GAC Buy Vessels	***ea***	***$16,000***	***V***			***4***	***$64,000***
Rent 8 vs. Buy 4 Vessels					**$240,000**		**$64,000**
AE Estimate							
V vendor data							
*Includes 600sf pad for lamella if needed later							
Subtotal					$1,199,940		$710,600
Mark-ups based on ROD		@68%			$815,960		$462,808
Redesign Costs							$20,000
Total					$2,015,900		$1,192,608

APPENDIX G

Resumes

Kenneth L. True, P.E., CVS.
Mobile: 402-516-2635
Home: 402-339-1936
E-mail kentrue@maladon.com

Summary

Six years working as an independent Value Engineering (VE) consultant and working part time for URS Corporation as a VE specialist. Thirty-one years with the Corps of Engineers (CE). Retired as the Northwest Division Value Engineer, coordinator for Division's Architect /Engineer selection process, and team leader for Engineering Divisions Engineering Quality Management System. Other CE work included cost engineering, Division construction quality control management team leader, District construction supervision and inspection, Engineering Division project management, District Value Engineer and nine years of construction field experience.

Major Accomplishments

- Participated in numerous CE VE studies in various roles.
- Achieved Certified Value Specialist Certificate from the nationally accredited program maintained by the Society of American Value Engineers, International.
- Successfully lead more than fifty VE studies.
- Leading role in the CE Value Engineering Advisory Committee.
- Prepared and presented a special one-day VE workshop for EPA regional office personnel. Delivered this presentation to the majority of the regional offices. This workshop highlighted some of the very successful Value Engineering applications performed on superfund sites.
- Taught in the CE PROSPECT program for fifteen years. Subjects included roofing, construction quality management, soils and masonry.
- Member of America Society of Civil Engineers, Society of American Value Engineers, and past member of American Society of Military Engineers.
- Active in many local community organizations.

Education

BS in Civil Engineering, University of Nebraska at Omaha
Mod I, VE workshop, Mod II, VE workshop
SAVE International yearly conferences and workshops
Numerous CE 40 hour workshops including HTRW overview program

Registrations

Professional Engineer, State of Colorado
Certified Value Specialist, SAVE International

R. Curtis Payton, II
(916) 557-7431
(916) 346-5613
curtis.payton@usace.army.mil

Summary

Registered geologist with over 20 years experience in environmental, geotechnical and seismic investigations. Prepares work plans, scopes of work, PA reports, SI reports, RI reports, cost estimates, proposals, design documents and public presentations for both government and private sector projects. Has directed multi-rig drilling efforts, performed trenching, borehole logging (including downhole), sampling (all media), aquifer testing, installation and development of water production and monitoring wells, groundwater modeling and contaminant fate and transport studies. He is an expert in the field of trench logging for both fault and forensic environmental investigations. Project Manager or Team Lead of several base wide environmental programs and brings experience in managing multiple contractor teams and Corps staff toward the goal of site closure and NPL delisting.

Major Accomplishments

- Coauthored, prepared and presented installation work plans and budgets to DA personnel in Maryland for BRAC & IRP installations.
- Implemented forensic environmental investigations to determine responsible parties along a petroleum pipe line corridor involving 4 pipelines and 5 RPs.
- Audited contractor efforts in the construction of UV-ox waste water treatment plant, 100-foot deep hydropunch operations, cleanup of pesticide contaminated infrastructure for a carnation farm.
- Managed and completed performance of 21 Preliminary Assessments in 30 days to meet customer deadline.
- Created standard internal government estimate format used by more than 20% of current Sacramento Project Management Staff in the HTRW PPMD group.
- Completed mathematical analysis of two different risk assessment methodologies to identify which was more conservative depending on the types of analytes assessed.
- Fault investigations at every major fault system. Identified (within 100 feet) the location of the northern split of the Tule Pond Splay on the Hayward fault.
- Earthquake assessments of residential and commercial structures for damage to foundations and structural walls. Currently a member of the USACE Structural Safety Assessment Team.
- Installed over 100 wells in a wide variety of depositional environments.
- Experienced in negotiation on HTRW actions with federal state and local regulatory agencies, including EPA Region 8 and Region 9, Utah-DEQ, California-CalEPA, -DTSC, -Fish and Game, -RWQCB (all regions), the regional program for Santa Clara Valley Water District.
- Current member of USACE Center of Expertise Value Engineering Team for EPA Superfund Program.

Education

B.S. Earth Sciences (Geology) at the University of California at Santa Cruz
Ctr. for Army Leadership LEAD Class – Reno, NV
USACE Leadership Development Program II

Registrations

California State Registered Professional Geologist No. 5608
California Registered Environmental Assessor I No. 193

John R. Hartley
Omaha NE. 68124
Work 402-293-2523
John.R.Hartley@USACE.ARMY.MIL

Summary

Fifteen years of providing technical support and project management with the US Army Corps of Engineers. Experience includes contaminated site characterization and remediation, geotechnical sampling, geotechnical design, drainage design and erosion control, and environment restoration including disturbed lands, wetlands and streams. Experience in writing investigation and removal action work plans, design documents and investigation reports. Knowledge of RCRA, CERCLA, SARA, TSCA, and Clean Water Act to ensure projects are designed and executed with full regulatory compliance.

- Project Manager with responsibility for business development, project scoping, estimating, design review and acceptance, contract negotiation and management. Identify the most efficient contract mechanism for the project and prepare project acceptance documentation. Coordinate with customer, contractors, regulatory agencies, regional Corps of Engineers districts and private concerns to preclude conflict of interests or jurisdictional disputes and to maintain effective public relations.
- Field Construction Manager with responsibility for review and approval of work plans and design packages. Provide technical assistance to ensure the most efficient method of implementing site remediation. Provide constructability and value engineering reviews of plans. In coordination with the contractor modify conceptual design and execution plan in the field as needed during execution of design-build projects to accommodate changing site conditions.

Major Accomplishments

- Project and Field Management of disturbed land projects for U.S. Park Service including estuary restoration.
- Performed contaminated wetland characterization and remediation, and landfill capping, at several sites for USFWS.
- Project Manager and geologist at Pemaco Superfund Site, CA. Investigation Utilized extensive direct push sampling and real time analysis, including the use of a membrane interface probe, to continuously log solvent contamination in the soil.
- Project and Field Manager for design and construction of on-site repositories for mine waste site. Perform the regulatory review and design justification..
- Project and Field Manager for design and construction at two large FEMA group home two sites in support hurricane relief efforts.
- Project Manager for in-house design of Rocky Mountain Arsenal Hazardous Waste Landfill. Developed a soil/water contaminant partitioning model to estimate leachate generated in RMA landfill for use in material testing.
- Project Manager for Rocky Mountain Arsenal Basin F and Submerged Quench Incinerator closure.
- Performed 2-d modeling in support of pump-and-treat, bioremediation, and soil-vapor-extraction remedial designs.

Education

Ph.D. Candidate in Geochemistry at University Of Texas at Austin
M.S. in Geology at University Of New Orleans
B.S. in Geology at University Of Nebraska at Omaha

Lindsey K. Lien
Geoenvironmental and Process Engineering Branch CENWO-HX-E
HTRW Center of Expertise
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(402) 697-2595 (fax)
lindsey.k.lien@usace.army.mil

Summary

Working knowledge of and practical experience with design and start-up of process equipment used in treatment systems. Provides technical assistance on granular activated carbon, advanced oxidation technologies, soil washing, solids handling and other soil and water treatment technologies. Writes technical guidance and design specifications for HTRW unit processes. Registered Professional Engineer NE-5616, July 1983 to present

Major Accomplishments

- National coordinator for a HQ-EPA/HQ-USACE initiative to develop an implementation plan for application of the Value Engineering (VE) process nationally. The initiative involves developing a VE protocol concurrently with a pilot program for performing up to 10 VE Studies at fund lead sites.

- Served as the HTRW-CX team leader for a variety of technical evaluations and resulting reports such as independent remedy assessments and Five Year Reviews with HTRW-CX staff in addition to authoring portions of those reports. One of those five year reviews was presented a national award for the Brown and Bryant Site by the USEPA as "The Outstanding Five Year Review of 2006", 2000 to present.

- Provided technical oversight during model development for the RACER budgeting cost estimating computer program used by Department of Defense agencies, and other private, local, state, and federal agencies, 1996-Present.

- Vineland Chemical Company, OU-2 Soils remedial action team member since initiation of remedial action – construction phase at the site. Activities included evaluation of requests for proposal, participation in the process design formulation, pilot studies, design and facility construction and ongoing operations, 2000 – present.

- Defense Depot Ogden, OU-4 start up and prove out of an innovative peroxide/ozone groundwater treatment plant treating vinyl chloride and chlorinated solvents, 1998.

- Maywood Formerly Used Site Remedial Action Program (FUSRAP). Full scale pilot plant study for segregating radioactive soils from clean soils using innovative soil sorting technologies, 1998-2000.

- Participated in numerous Remediation System Evaluations (RSE's) including Ellsworth AFB, SD, Oconomowoc, WI, Silresm, MA, Higgins Farm, NJ, Peerless Plating, WI, Hanford, WA as well as numerous others, 2000 to present.

Education

B.S. Civil Engineering, South Dakota State University, 1978
M.S. Civil/Environmental Engineering, University of Nebraska, 1985

Affiliations

Registered Professional Engineer, Nebraska E-5616, 1983
Gulf Coast Hazardous Substance Research Center, Technology Transfer Committee 1999-present

Gregory J. Mellema, PE
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U.S. Army Corps of Engineers
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(402) 697-2613 (fax)
gregory.j.mellema@usace.army.mil

Professional Experience

1994 to Present: U.S. Army Corps of Engineers HTRW Center of Expertise, Omaha, NE.
1989 to 1994: U.S. Army Corps of Engineers, Omaha District, Geotechnical Branch, HTRW Design Section.
1984 to 1989: U.S. Army Corps of Engineers, Omaha District, Operations Division

Education:

B.S. Civil Engineering, University of Nebraska - Lincoln, 1984

Special Knowledge and Skills: (as it relates to environmental work)

Working knowledge of and practical experience with design of containment systems for landfills, groundwater cutoff walls, collection trenches, and other geotechnical aspects of HTW design.
Internal Auditor for ISO 14001 Environmental Management Systems
Write technical guidance and design specifications for HTRW containment systems.
Registered Professional Engineer NE-6680, February 1989 to present

Projects:

National coordinator for a HQ-EPA/HQ-USACE for CERCLA Five-Year Reviews. Schedule and budget for reviews, provide training and quality assurance reviews of final products, since 1998.

Member of HQUSACE ISO 14001 EMS Audit Team. Conducted audits of Corps of Engineers Civil Works Facilities to ensure conformance with the current standard.

Participate in numerous technical assistance projects for EPA, including Rhone-Poulenc, WA; WDI, CA; Rocky Mountain Arsenal, CO; Marion Pressure Treating Site, LA; and many others.

Affiliations:

Registered Professional Engineer, Nebraska E-5616, 1983
EPA Engineer Forum
Interstate Technology Regulatory Council

Publications:

ETL 1110-1-162, Hazardous Waste Landfill Cover Design
ETL 1110-1-163, Vertical Barrier Walls
UFGS 2262, Slurry Walls

Trainer/Speaker:

USACE PROSPECT Instructor since 1992 for environmental site remediation, construction, and ecological reuse.
Speaker at numerous national conferences as a panelist, moderator, or presenter.