OUTBOARD MARINE CORPORATION
SUPERFUND SITE

Value Engineering Study
For
U.S. Environmental Protection Agency

Study Date: October 16-18, 2007

Final Report
December 14, 2007

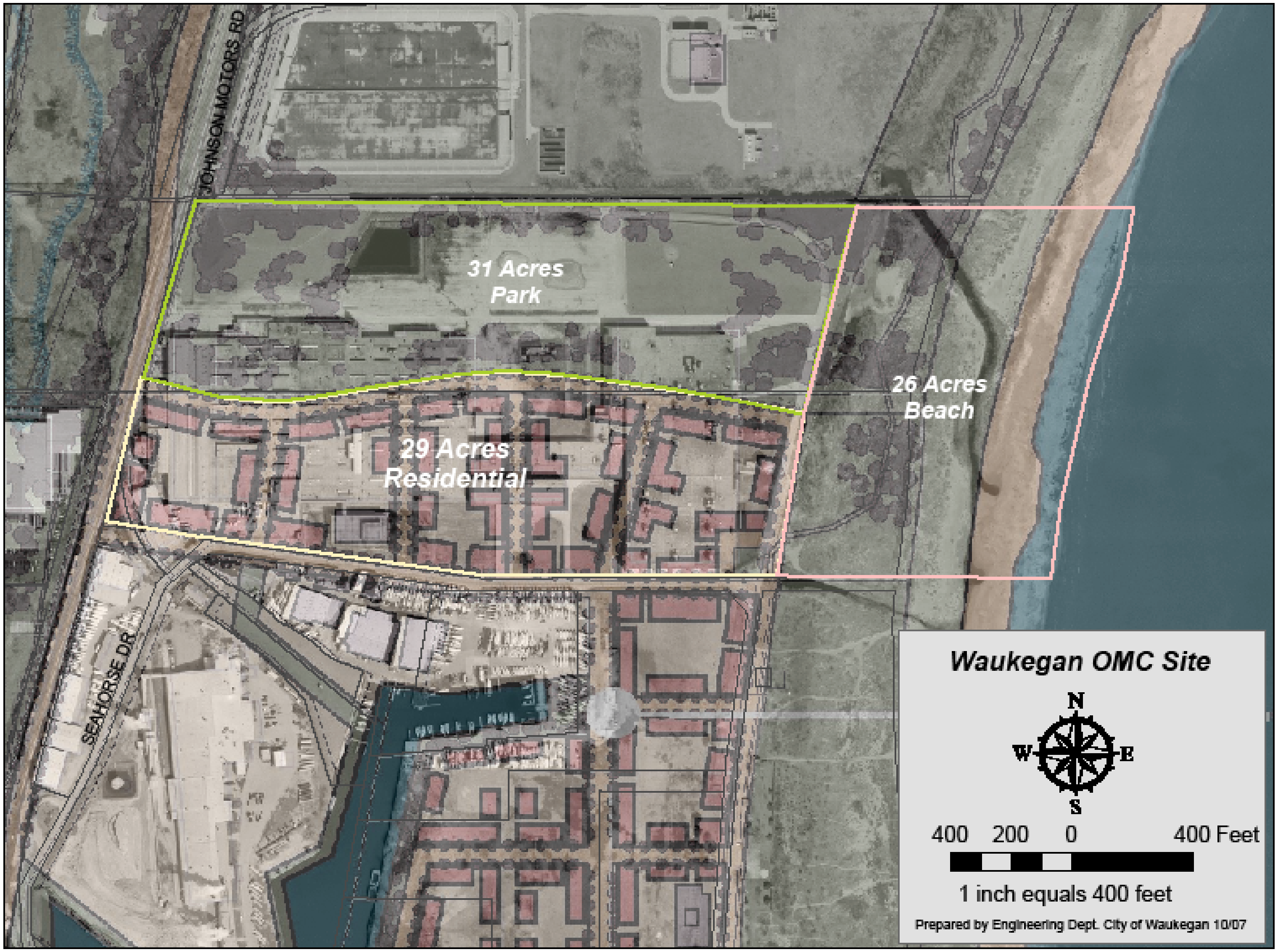
US Army
Corps of Engineers

US Environmental
Protection Agency

TABLE OF CONTENTS

APPENDICES

Outboard Marine Corporation Superfund Site Map



EXECUTIVE SUMMARY

General

The United States Army Corp of Engineers (USACE) Hazardous, Toxic, and Radioactive Waste (HTRW) Center of Expertise (CX) performed a Value Engineering Screen and Study (VE Study) on the Outboard Marine Corporation (OMC) Superfund Site located in Waukegan, Illinois. The OMC Plant 2 Site is a 60-acre industrial property on the Michigan lakefront in Waukegan, Illinois. 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.

The VE Study was conducted October 16, 17, and 18, 2007 in the Waukegan City Engineers conference room located in Waukegan City Hall, downtown Waukegan, IL. The study included a site visit on October 16, 2007.

This VE Study is 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.

Another objective in executing a VE Study is to meet the requirements of 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 dated 14 April, 2006. The VE process accomplishes this within the existing design schedule with minimal disruption.

Preliminary recommendations and comments resulting from a VE Study are briefed to the primary stakeholder, EPA, for comment and content, and screened to eliminate those considered to be outside the scope of the study prior to full development to eliminate lost effort. The resulting recommendations are then developed and provided to the EPA RPM, remedial action design team, or others designated by the RPM for comment. Following review comment incorporation, the final report is presented to the designer for incorporation within the design concurrently with comments from the EPA, USACE, State, or other stakeholders with no impact on the overall schedule. Guidelines for incorporation of VE design comments and recommendations are addressed in OSWER 9335.5-24.

Estimate of Construction Costs and Budget
The total projected capital construction cost for the scope of the remediation addressed by this VE study, building removal and PCB soil clean up under the building, as identified in the Preliminary (30%) Remedial Design submittal by the designer, CH2MHill, is $35,250,000.

Summary of VE Study Results
During the speculation phase of this study, 38 creative ideas were identified. Ten of these ideas were developed into VE recommendations with cost implications where applicable.

The following table presents a summary of the ideas that were developed into recommendations and cost addressed where considered feasible. Cost can be an important issue for comparison of VE recommendations. Cost estimates as prepared for this VE Study are from the Preliminary (30%) Design Estimate, published cost databases and/or VE team member experience. 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.

SUMMARY OF RECOMMENDATIONS

REC # NUMBER	DESCRIPTION	POTENTIAL SAVINGS (COST)
1	Reuse sand (14,000 CY pile) for asphalt mix.	$1,982,020
2	Provide on-site consolidation storage (non-TSCA materials) (FS 3b & 3s).	$1,273,000
3	Combine lead and asbestos work, concurrent with PCB decon (contracting phase to be determined).	$79,368
4	Re-evaluate order of work. Do bldg demo prior to soil removal work within funding constraints. Remove most contaminated materials first.	$74,134
5	Sample under east road to determine if soil underneath pavement is contaminated (trench along both sides of the road and sample).	$400,000
6	Relax Compaction Requirements.	$6,455 to $312,713
7	Turn over the entire project to the City or their Developer.	Not calculated.
8	Leave 14,000 cubic yards stockpile and dispose in existing eastern cell.	$8,700
9	Utilize the services of private laboratory services, or utilize the services of U.S. EPA's contract lab program.	Not calculated.
10	Send contaminated steel directly to a certified smelter for recycling.	$1,484,000

Significant Aspects of the VE Study
Several items make this particular study unique. The City of Waukegan has taken over ownership of the site and therefore has a vested interest in the final outcome of the remediation. The site has a very high potential land value as lakefront property when remediation is complete. The Waukegan City Engineer also participated full time in the VE study, sharing his expertise and knowledge of the site. The participation of the property owner brought a unique perspective and had a very positive effect on the study.

Notice
Application of Results of this Value Engineering Study

This VE Study constitutes a review of preliminary (30%) design documents at this point in time. As with all VE studies, the design documents are reviewed using VE principles in an effort to improve its overall value and worth. Numerous recommendations for changes and design comments have resulted from this 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 (30%) 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 aid in the approval process.

Acknowledgments
The study members should be commended for their effort and perseverance in accomplishing this successful VE study. Special thanks are extended to the EPA RPM and the design firm, CH2MHill, for their cooperation and full participation in this team VE study effort. Combined with the members from the USACE, these experts shared information with each other and generated several significant ideas that could improve the value of this remediation. The designers and EPA RPM and other technical personnel are always encouraged to participate in these studies to the maximum extent possible.

The combined efforts of all of these individuals are what produced the positive results of this study. The facilities and support provided to the team at City Hall were outstanding. A special thanks is also extended to the Waukegan City Engineer, John Moore, for his interest, corporation, support, and participation during the study.

Value Engineering Screening Study Team Members

NAME	**ORGANIZATION**
Ken True	CVS, Contractor
Greg Mellema	USACE-HTRW CX
Curtis Payton	USACE
John Hartley	USACE
James Harbert	USACE
John Moore	City of Waukegan
Kevin Adler	USEPA, RPM
Ken Theisen	USEPA, Rapid Response
Rich Block	CH2MHill
Jewelle Keiser	CH2MHill

Results of Study

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 the USACE VE Coordinator.

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 Study Team Facilitator

SECTION 1 – INTRODUCTION

This report documents the results of the VE Study on the Outboard Marine Corporation (OMC) Superfund Site located in Waukegan, Illinois. The OMC Plant 2 Site is a 60-acre industrial property on the Michigan lakefront in Waukegan, Illinois. The study team was from the USACE HTRW Center of Expertise, the EPA RPM, the design firm CH2MHill, the City of Waukegan, and 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 is included to give the reader an idea of the standard VE methodology, consisting of six phases:

Information Phase: The Team reviewed and studied the current Preliminary Design, Basis of Design Report dated October 2007, the Record of Decision (ROD), portions of the Remedial Investigation and Feasibility Study, EPA criteria documents, figures, descriptions of project work, and the 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 if they were worthy of refinement. 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 team wrap up briefing on the afternoon of October 18, 2007. The State of Illinois EPA representative was included in this briefing via telephone. The recommendations were in rough draft form at the time of the presentation. This report will be distributed for review by the Corps of Engineers and EPA to various project stakeholders 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 October 16-19 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 portion of the work at this site.

Boundary of the Study

This study was performed for Outboard Marine Corporation (OMC) Superfund Site located in Waukegan, Illinois, building removal and remediation of soil under the building contaminated with site contaminants. As such, neither the Corps of Engineers nor EPA has yet had an opportunity to review and comment on this draft document. This VE study did not address any remediation other than the soils, OU-2, but some discussions about the other work at the site was included during this study. There were no other limits put on the discussion during the VE study regarding the project.

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.

Design 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 the Outboard Marine Corporation Superfund Site located in Waukegan, Illinois. 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 5 and the USACE HTRW-CX.

Project Description

The OMC Plant 2 Site is a 60-acre industrial property on the Michigan lakefront in Waukegan, Illinois. The site is bordered by the North Shore Sanitary District (NSSD) to the north, Lake Michigan to the east, Sea Horse Drive and Waukegan Harbor to the south, and E.J. & E Railroad tracks to the west. The North Ditch drains upland (offsite) areas and runs along the NSSD border towards Lake Michigan until it turns to the south close to the lake. The lakefront portion of the site is emergent dune land and beachfront. Except for the North Ditch, there are no existing wetlands on the site.

USEPA began a remedial investigation (RI) at the OMC Plant 2 site in 2004 to determine the nature and extent of contamination in site groundwater, sediment, and soil and within the OMC Plant 2 building. The *Remedial Investigation Report*, including the investigation results and human health and ecological risk assessments, were issued in April 2006. A feasibility study (FS) was conducted in 2005 to examine site cleanup alternatives designed to protect human health and the environment, and the *Feasibility Study Report* was issued in December 2006.

In January 2006, USEPA's Emergency Response Branch began a removal action in the dune area near the East Containment Cell because high levels of PCBs were found in the sands outside the cell. The removal activities included soil excavation from two areas adjacent to the East Containment Cell and a 150-foot stretch of the South Ditch to a depth of about 2 feet. The limits of the excavation were continued until the side wall concentrations exhibited PCB concentrations generally below 10 parts per million (ppm). The removal action included the excavation and offsite disposal of over 6,000 cubic yards (yd3) of sandy soil containing 10 to 14,000 ppm Aroclor 1248. USEPA also cleaned out several storm sewers leading from the OMC Plant 2 facility to prevent recontamination of the beachfront by residual PCBs discovered in the sewer lines.

Based on the results of USEPA's remedial investigation, the City of Waukegan hired a contractor to demolish the nearly 400,000 SF of uncontaminated structures down to the concrete slabs beginning in August 2006.

The City of Waukegan and USEPA also removed all of the PCB-containing transformers except for one that remains on the roof of the building. About 25 PCB-containing electrical transformers were disposed of offsite at a licensed facility in January 2007. In addition, an extensive amount of copper wire and electrical connectors from the plant were removed and recycled to reduce the incentive for scavengers to break into the facility and potentially be exposed to PCB contamination.

The USEPA identified four media of concern that may contain contaminant concentrations exceeding human health or ecological risk-based cleanup levels. These media include the following:

- Soil and sediment
- OMC Plant 2 building materials
- Groundwater
- DNAPL

Upon review of public comments on the proposed plan for OU 2, USEPA issued a Record of Decision (ROD) for the cleanup of the soil and sediment and building media in August 2007.

The remedial action objectives (RAOs) for the OMC Plant 2 site soil and sediment and building media is to actively reduce the concentrations of COCs to levels that would allow the property (except for the existing PCB containment cells) to be reused for residential and recreational purposes without restrictions and to meet protective levels for ecological receptors.

The selected site cleanup for OU 2 is planned to be implemented in two major phases. The first phase of actions to be implemented at the OMC Plant 2 site consists of the following components:

- Excavation of the soil in areas outside the building footprint and sediment in the North Ditch and South Ditch that contain concentrations exceeding 1 ppm PCBs and/or 2 ppm PAHs.

- Offsite disposal of soil and sediment that exceed 50 ppm PCBs (or a surface concentration of 10 micrograms (μg)/100 square centimeters [cm2]) in a Toxic Substances Control Act (TSCA) compliant facility.

- Offsite disposal of soil and sediment with concentrations that exceed 1 ppm PCBs (or a surface concentration of 100 μg/100 cm2) and 2 ppm PAHs in a Resource Conservation and Recovery Act (RCRA) Subtitle D landfill.

- Portions of the excavated areas will be backfilled with clean, uncontaminated soil and revegetated. Other portions of the excavated areas will remain open but fenced until backfilled and revegetated during the second phase.

- Pre-demolition activities will include removal of the asbestos and lead, along with attempts to decontaminate the PCB-impacted porous and nonporous surfaces to accommodate the recycling of steel, copper, concrete, and usable equipment, and the consolidation of the bulk of demolition debris prior to offsite disposal.

The second phase of actions to be implemented at the OMC Plant 2 site consists of the following components:

- The demolition of the PCB-contamination portions of the OMC Plant 2 building, including impacted concrete floors and excavation of soil containing concentrations exceeding 1 ppm PCBs within 20 feet of the building. Unsaturated zone soil below the building footprint exceeding the criteria, will either be excavated and disposed offsite or treated onsite prior to offsite disposal. A soil management plan will address remediation of the soil and concrete tunnels found beneath the building. The remediation of unsaturated zone soil below the building slab will be based on contaminant types, concentrations, and volume that will be determined upon removal of the slab. The building's concrete footings will remain in-place after the building demolition. Uncovered concrete tunnels would be sampled after removal of the slab, and disposal options would be evaluated at that time. If they are found to be uncontaminated, they may be filled with uncontaminated concrete rubble.

- The offsite disposal of soil and building debris that exceed 50 ppm PCBs (or a surface concentration of 10 µg/100 cm2) in a TSCA-compliant facility.

- The offsite disposal of soil and non-recyclable building debris with concentrations that exceed 1 ppm PCBs but less than 50 ppm PCBs (or a surface concentration greater than 100 µg/100 cm2 but less than 10 µg/100 cm2) and exceed 2 ppm PAHs in a RCRA Subtitle D landfill.

- Excavated areas not filled during the first phase and excavated areas created during the second phase will be backfilled with soil or recycled building materials and revegetated.

Estimate of Costs

According to the cost estimate provided in the Preliminary Basis of Design Report, the estimated cost for the project with all applied mark-ups and contingencies is $35,250,000.

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: Outboard Marine Corporation Superfund Site
LOCATION: Waukegan, Illinois
STUDY DATE: October 16-18, 2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Reuse sand (14,000 CY pile) for asphalt mix.

Creative Idea 1.

ORIGINAL DESIGN:

The original design called for this pile of sand, which is located north of the OMC building and is contaminated with one to two parts per million of PCB's, to be loaded, hauled, and disposed of at a landfill.

RECOMMENDED CHANGE:

Screen the sand pile then load and haul to local asphalt plant where it will be used as part of the asphalt mix for paving roads.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$2,578,380		$2,578,380
RECOMMENDED DESIGN	$ 596,360		$ 596,360
ESTIMATED SAVINGS OR (COST)	$1,982,020		$1,982,020

VALUE ENGINEERING RECOMMENDATION # 1

ADVANTAGES:

- Meet recycling goals.
- Fixation of contaminates.
- Eliminate landfill costs.

DISADVANTAGES:

- Adds cost of screening.
- QA/QC.
- Will the regulations allow this?
- Will the asphalt plants take the material?
- Will there be air pollution violations when the mix is heated to make asphalt?
- Can they store the sand on-site?

JUSTIFICATION:

The reuse of the sand spoil pile in asphalt saves landfill space as well as conserves the additional mining of sand as the fine material in asphalt.

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
T&D < 50ppm PCB's	TON	70.00		21,000	$1,470,000	2,000	$140,000
Truck Sand to Asphalt Plant	TON	5.00			$0	19,000	$95,000
Screen Sand	TON	5.00			$0	21,000	$105,000
Subtotal					$1,470,000		$340,000
Mark-up		@	75%		$1,108,380		$256,360
Redesign Costs							
Total					$2,578,380		$596,360

VALUE ENGINEERING RECOMMENDATION # 2

PROJECT: Outboard Marine Corporation Superfund Site
LOCATION: Waukegan, Illinois
STUDY DATE: October 16-18, 2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Provide on-site consolidation storage (non-TSCA materials) (FS 3b & 3s).

Creative Idea 2.

ORIGINAL DESIGN:

The design includes removal and non-TSCA off-site disposal of:
- 14,000 cubic yards stockpile,
- 58,000 cubic yards of soil and sediment, and
- 11,000 cubic yards of building materials.

Approximate Cost: $4,565,000

83,000 CY of soil removal (loading, transportation, and non-TSCA disposal) @ $55/CY = $4,565,000.

RECOMMENDED CHANGE:

Consolidate the non-TSCA soils and building materials into the existing eastern containment cell, and the area immediately west. This would require removing 1400 LF of access road, removing the existing cover material, installing a slurry wall, placing the 72,000 CY (stockpile, soil, and sediment) and 11,000 CY of building materials, install a new liner, place soil cover material, and place vegetative cover.

Approximate Cost: $3,383,000

4000 SY of concrete road, and 13,000 SY of asphalt lot removal: 17,000SY @ $ 5/SY = $85,000.
Remove and stockpile soil under asphalt lot for future cover material (assumes 200 x 600 x 2ft): 8,900CY @ $4/CY = $35,600.
Remove east cell cover material (assumes 250 x 500 x 2ft): 9,200CY @ $4/CY = $36,800.
Install slurry wall to key into clay: (26 ft deep x 1000 ft long x 2 ft thick) 2,900SY @ $300/SY = $870,000.
Placement of 83,000 CY (loading, transportation, and placement) @ $7/CY = $581,000.
Placement of liner and cover material: 7 acres @ $250,000/acre = $1,750,000.
Vegetative cover: 7 acres @ $3,500/acre = $24,500.

VALUE ENGINEERING RECOMMENDATION # 2

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$4,565,000	0	0
RECOMMENDED DESIGN	$3,383,000	0	0
ESTIMATED SAVINGS	$1,273,000	0	0

ADVANTAGES:

- Eliminate the fees associated with transportation and disposal.
- Minimize traffic volume on Seahorse Dr. The beach is accessed via Seahorse Dr. and is busy in summer months.
- As needed offsite borrow materials (at minimal cost) will likely be available for constructing the required cover material.
- Possible significant cost savings.

DISADVANTAGES:

- The City currently provides operation and maintenance (O&M) for the existing containment cells. Incorporating more non-TSCA material onsite will increase the City's O&M costs. These costs are not reflected in the life cycle costs above.
- Illinois EPA is currently mandating that the consolidation of materials on-site meet the subtitle D landfill requirements.
- Consolidation of additional materials on-site may produce constraints on the future developments. The consolidated material pile footprint would be approximately seven acres, and nine feet high. This assumes the consolidation materials would be placed at a beginning elevation that is two feet below current grade.
- Would need to remove the existing cover material prior to placement of the soil, and install a new liner and place the cover material.
- Increased fees to design and oversee construction of the consolidation area.
- The landfill tipping fee and IEPA requirements will have an impact on this recommendation. A $10/CY drop in tipping fees could cause this recommendation and the current design to be similar in cost.

JUSTIFICATION:

With the estimated unit rates (which will be even lower when competitively bid) and the IEPA subtitle D requirement, it appears that on-site consolidation may produce a cost savings.

VALUE ENGINEERING RECOMMENDATION # 3

PROJECT: Outboard Marine Corporation Superfund Site
LOCATION: Waukegan, Illinois
STUDY DATE: October 16-18, 2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Combine lead and asbestos work, concurrent with PCB decon (contracting phase to be determined).

Creative Idea 3.

ORIGINAL DESIGN:

Asbestos abatement and lead paint abatement is to be performed in Phase I with field work for both activities being performed concurrently. PCB decontamination for demolition would be performed in Phase II.

RECOMMENDED CHANGE:

Combine all asbestos and lead paint abatement, together with structure decontamination activities, into the same mobilization/ Phase of field work.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	NA		
RECOMMENDED DESIGN	NA		
ESTIMATED SAVINGS OR (COST)	$79,368		

The main savings for this suggestion is in schedule compression with associated contractor management reduction. In addition there would be government/START contractor oversight reductions which are not part of this calculation. Site management costs were included in the design estimate as a percentage of the total cost which would not reflect impact by a schedule compression. Since the compression comes primarily from activity overlap, sub contract costs would remain the same and would not affect ODC calculated as a percentage of total cost. For the purpose of cost impact evaluation associated with schedule compression, typical site ODC and management costs were estimated.

VALUE ENGINEERING RECOMMENDATION # 3

The use of shared building containment / engineering controls adds efficiency and should be reflected in lower bid prices from at least one of the subs. Those savings were not calculated.

Current schedule:

Phase I asbestos and lead paint abatement: 60 days field work.
Phase II decon: 60 days field work.

Assume 20 days for asbestos abatement to free enough room for other activities to proceed which results in 40 days schedule compression.

COST BUILDUP
Assuming 40 day project compression the following would be a reasonable cost reduction for management and ODC.

Trailer (x2) $400/mo x 1.5 = 1200
Site utilities $250/mo x 1.5= 375
Portolet $100/mo x 1.5 = 150
Pickup w/fuel $50/day x 40 = 2000
Project manager @ $55/hr x 10 hr/wk x 6 wks= 3300
Procurement/ billing @ $28/hr x 10 hrs/ wk x 6 wks = 1680
Site Super @ $48/hr x 50 hr/wk x 6 wks = 14,400
Site Safety Officer/T&D coordinator @ $35/hr x 50 hr wk x 6 wks = 10500
Perdiem 2 persons at $200/day x 40 days = 16,000

SUBTOTAL Contractor $49,605
Contractor mark up 1.6 (did not include general conditions) = $79,368

ADVANTAGES:

- Schedule compression involving procurement, plans, and field execution. Current schedule calls for field activities for asbestos and Pb Paint to start contracting 1-16-09 with a total duration of 143 days and a construction span 05-05-08 to 6-02-06. Decon procurement activities start 9-2-08 with a total duration of 314 days and construction spanning 2-12-09 to 6-11 09. Parallel execution of all building preparation activities results in a minimum 40 day schedule compression associated with field activities. However, it also allows immediate initiation of bldg demo upon receiving phase II funding which in turns allows for quicker access to soil remediation. Accelerating those start dates could result in additional schedule compression.
- Potential for the same contractor who is doing lead based paint, and potentially asbestos, removal to do building decontamination reducing the number of subcontractors and associated management effort

VALUE ENGINEERING RECOMMENDATION # 3

- Potential for the same process used for decon to be used on Pb paint abatement which reduces contractor costs. Those potential savings were not calculated since extent of Pb paint impact is not known. Completely addressing one area makes the work more efficient than doing Pb paint and then coming back for general decon.
- Potential to do confirmatory sampling for both Pb and PCB at the same time reducing the amount of time required for sampling. Those savings were not estimated.
- All level C work would be performed at one time reducing the duration of additional level of safety oversight required when in high levels of ppe. Once decon is done the project should be level D.
- Containment barriers installed during asbestos abatement would be used for Pb paint abatement and decon without risk of damage to those structures during the time down period between contracts that occurs when the activities are separated.
- Exterior transite panels should remain in place until all interior abatement and decon activities are complete. Parallel tracking all abatement and decon activities allows for portions of the building to come available for transite removal prior to completion of the decon of the entire bldg. The need for keep transite panels up during decon was not considered in the design or schedule. If transite was removed early some other barrier would need to be emplaced resulting in additional costs and schedule requirements.

DISADVANTAGES:

- Need to coordinate multiple exclusion zones within the building and the potential need to asbestos train all workers who enter the building while asbestos abatement is underway anywhere in the bldg.
- Need to recalibrate the activity schedule to available funds. This may require putting some of the soil excavation off until phase II if sufficient funds are not available.

.

JUSTIFICATION:

Compression of the schedule by overlapping tasks reduces the management time which is a function of project duration, making oversight more efficient. The tasks in question also allow the use of shared building containment / engineering controls, which adds efficiency and should be reflected in lower bid prices from at least one of the subs. Accelerating the construction schedule also frees up the site for development earlier.

VALUE ENGINEERING RECOMMENDATION # 4

PROJECT: Outboard Marine Corporation Superfund Site
LOCATION: Waukegan, Illinois
STUDY DATE: October 16-18, 2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Re-evaluate order of work. Do bldg demo prior to soil removal work within funding constraints. Remove most contaminated materials first.

Creative Ideas 4 and 7.

ORIGINAL DESIGN:

The original design calls for execution of asbestos and lead paint abatement and removal of impacted soils in the site ditches during Phase I with all building work and subslab soils being addressed in Phase II.

RECOMMENDED CHANGE:

Ensuring building decontamination was performed together with asbestos and lead paint abatement was addressed in recommendation 3.

Building on that recommendation, building decon and abatement activities should be the first performed, followed by demolition of the building. Some building demolition may be performed during phase 1 depending on funding. Otherwise complete building prep would be performed Phase I with other work delayed until Phase II funding came in so as to maximize management efficiency associated with bldg demo and soil excavation. Slab removal and soil excavation would be performed following building demo. Ditch excavation could be performed concurrently with the end stages of the building removal.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	NA		
RECOMMENDED DESIGN	NA		
ESTIMATED SAVINGS OR (COST)	$74,134		

VALUE ENGINEERING RECOMMENDATION # 4

ADVANTAGES:

- Combining excavation related activities together allows for the procurement and mobilization of a single contractor one time only for removal of impacted slabs and soils.
- A single mobilization eliminates one round of equipment decontamination.
- Shipping all contaminated soil offsite in one mobilization eliminates one set up and teardown of the haul truck lining and decon station.
- Multiple phases of excavation may require generation of separate waste profiles for each phase of work depending on requirements of receiving facility.
- Concurrent execution of all soils/excavation related activities allows for multiple work crews addressing different areas of the site while sharing oversight and management personnel between the activities, e.g. the excavation supervision could remediate ditches and subslab soils at the same time if all dirt work is combined, whereas if the two tasks are separated that supervisor will need to be present for both phases of activities which results in more management, safety, billing etc. hours.
- More work flexibility so that if excavation work is delayed in one area of the site the work crew can have more other areas as options to move to without having to shut down. In addition if work in one area gets completed ahead of schedule that crew could potentially move to assist on another excavation area on the site and further accelerate the overall completion schedule.

DISADVANTAGES:

Need to reschedule work and potentially delay starting some of the excavation activities if there is not enough Phase I funding to carry over to Phase II without demob.

JUSTIFICATION:

Cost Savings for this change are likely to be minimal relative to the overall cost of the project when only the mob/demob, decon, and setup costs are evaluated. However the additional site management flexibility associated with doing all excavation type activities could shorten the overall project duration with a significant cost impact associated with reduced management effort.

<u>COST BUILDUP</u>
Setup and remove truck lining scaffold and decon station

Site Super @ $48/hr x 30 hrs = 1440
Site Safety Officer/T&D coordinator @ $35/hr x 30 hrs = 1050
Labor 4 persons @ $26/hr x 30 hrs ea =$3120

VALUE ENGINEERING RECOMMENDATION # 4

Perdiem 6 persons at $200/day x 3 days = 3600
Pickup w/fuel $50/day x 2 x3days = $300

Mob demob heavy eqpt: assume 3 pieces at $1000 ea = $3000

Subtotal: $11,610 x 1.6 markup
Total = $18,576

ADDED NOTE FOR SAVINGS

Per calculations for recommendation 3, an additional $1985/day ($13,889/wk) is saved in reduced management associated with schedule compression. Phase 1 schedule shows 4 months for sediment and soil excavation while Phase II has an additional 6 months. Accepting the fact that excavation efficiency will be limited by disposal trucking, it is likely that a minimum of 4-6 weeks schedule compression could be realized by having the entire site open for soil removal and having excavation proceeding in more places at once. Using the lower number the minimum cost savings for schedule compression would be an additional $57,728

VALUE ENGINEERING RECOMMENDATION # 5

PROJECT: Outboard Marine Corporation Superfund Site
LOCATION: Waukegan, Illinois
STUDY DATE: October 16-18, 2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Sample under east road to determine if soil underneath pavement is contaminated (trench along both sides of the road and sample).

Creative Idea 18.

ORIGINAL DESIGN:

The site has two access gates. The north gate is located at the northwest corner of the property. The south gate is located at the southeast corner of the property

The remedial investigation identified PCB contamination on the east side of the east road. Elevated PCB detections were encountered along the northern segment of the east road. Detections between 1 ppm and 2 ppm were encountered along the southern segment. The residential cleanup criteria is 1ppm.

The design includes the removal of the eastern most portion of the access road (leading to the south gate), excavation and off-site disposal of non-TSCA soils under and adjacent to the road, and backfill/compact the road with gravel. The excavation efforts would be sequenced to minimize the closure of the access road.

Approximate Cost: $422,500

2,500 SY of concrete road removal @ $ 5/SY = $12,500
5,000 CY of soil removal (excavation, transportation, and non-TSCA disposal) @ $62/CY (assumes 2 feet of soil removal) = $310,000
5,000 CY of backfill/compaction @ $20 / CY = $100,000

RECOMMENDED CHANGE:

Collect samples on the west side of, and possibly under, the road to determine if contamination exists under to the road.

If contamination is encountered along the road, sampling under the road may be necessary to determine extent of contamination beneath the road.

Approximate Cost: $21,835

VALUE ENGINEERING RECOMMENDATION # 5

Assume:
Driller - Two days of probing and soil sampling @ $3,500/day = $7,000
Geologist – 24 hours @ $100/hr = $2,400
Analyze 15 soil samples for PCB analysis @ $829/sample = $12,435

Recommended design change cost does not include road removal.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$422,000	0	0
RECOMMENDED DESIGN	$22,000	0	0
ESTIMATED SAVINGS	$400,000	0	0

ADVANTAGES:

- Site access is critical. The road is adjacent to the south gate. Egress should be maintained as much as possible.
- If the sample results indicate that there is no contamination along or under the road, the road would remain in place, and the overall volume of excavated soil to be excavated would be reduced.
- The concrete road would provide a better access route vs gravel.
- Possible significant cost savings.

DISADVANTAGES:

- Additional investigative costs to collect and analyze the soil adjacent to the road.
- If the road is not removed during the remedial action, the City will be responsible for, and pay the cost, to remove the road.

JUSTIFICATION:
Additional soil sampling could provide significant cost savings.

VALUE ENGINEERING RECOMMENDATION # 6

PROJECT: Outboard Marine Corporation Superfund Site
LOCATION: Waukegan, Illinois
STUDY DATE: October 16-18, 2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Relax Compaction Requirements.

Creative Idea 19.

ORIGINAL DESIGN:

The 30% design required the PCB and SVOC excavated areas outside the building limits to be backfilled with recycled concrete and soil fill material. The Designer of Record estimated over 30,000 CY of soil would be required to be imported and placed in 6 inch compacted lifts.

RECOMMENDED CHANGE:

We recommend requiring a less restrictive lift thickness and compaction requirement for the excavated areas outside the building limits. In the spirit of PBC contracting, the Designer of Record should explore compaction objective requirements rather than mandating a lift thickness.

Acceptance of this value engineering recommendation will result in a reduction as demonstrated chart (Figure #1) below. It should be further noted that the Designer of Record's estimate included an additional 21,000 CY of contaminated soil to be excavated once the building's concrete slab is removed and the soil can be characterized. However, the estimate did not include importing soil and backfilling this area. Therefore, this area was not included in this Value Engineering Recommendation. If this value engineering recommendation is accepted to include the excavation areas within the building limits, additional savings will be realized.

VALUE ENGINEERING RECOMMENDATION # 6

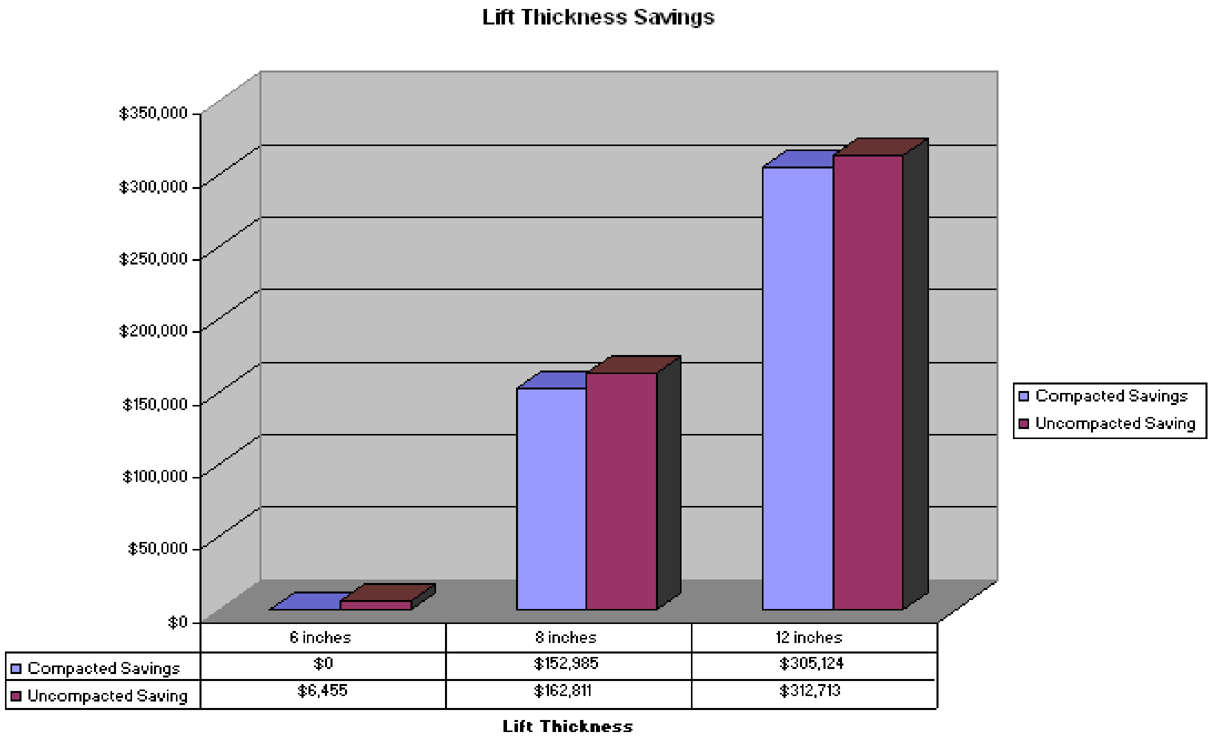


Figure 1: Cost savings compared to lift thickness and compaction effort

VALUE ENGINEERING RECOMMENDATION # 6

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$642,252	$0.00	$642,252
RECOMMENDED DESIGN 6” Lifts with no compaction	$635,797	$0.00	$635,797
ESTIMATED SAVINGS OR (COST)	$6,455	$0.00	$6,455
RECOMMENDED DESIGN 8” Lifts with no compaction	$479,441	$0.00	$479,441
ESTIMATED SAVINGS OR (COST)	$162,811	$0.00	$162,811
RECOMMENDED DESIGN 12” Lifts with no compaction	$329,539	$0.00	$329,539
ESTIMATED SAVINGS OR (COST)	$312,713	$0.00	$312,713
RECOMMENDED DESIGN 8” Lifts with compaction	$489, 267	$0.00	$489, 267
ESTIMATED SAVINGS OR (COST)	$152,985	$0.00	$152,985
RECOMMENDED DESIGN 12” Lifts with compaction	$337,128	$0.00	$337,128
ESTIMATED SAVINGS OR (COST)	$305,124	$0.00	$305,124

ADVANTAGES:

- Non-structure fill applications.
- Simplifies construction practices.
- Saves construction time.
- Reduces the number of lift placements.
- Planned future use and engineering guidelines will allow thicker lifts and less compaction.
- PBC specifying a compaction standard (i.e. 90% compaction for overburden area) will give the contractor the flexibility to adjust his operation to meet.

DISADVANTAGES:

- Possible differential settlement.
- Limit of excavation may dictate the depth of backfill.

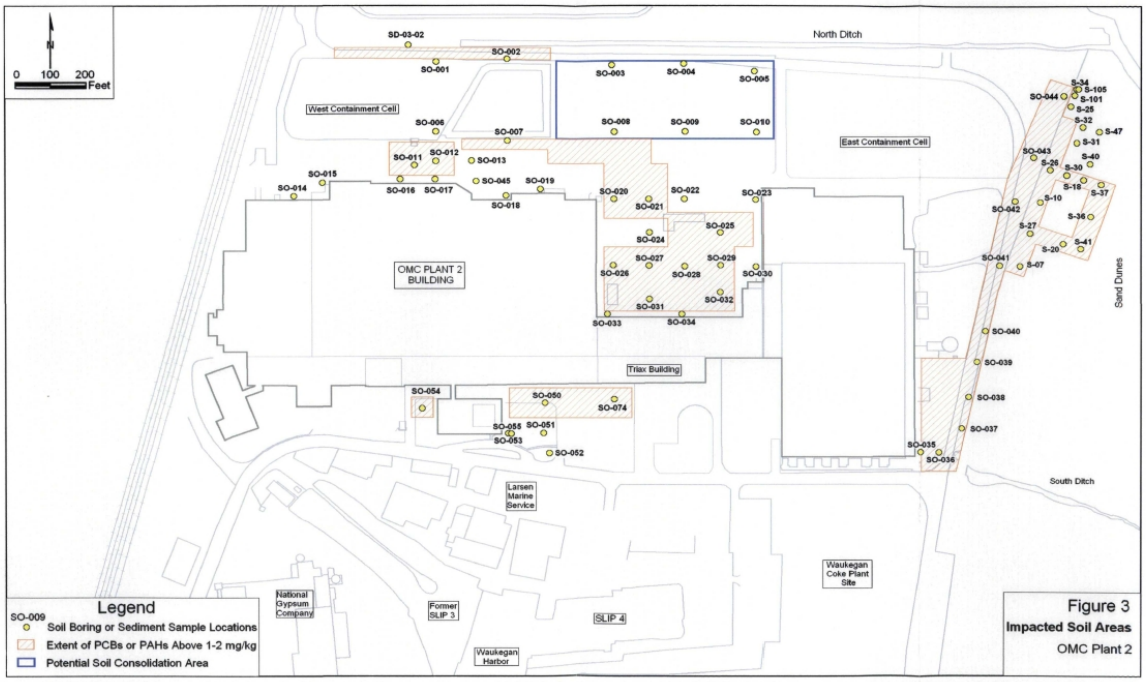
JUSTIFICATION:

Problem with placement of backfill is it varies from one construction project to another. The magnitude of the problems will depend on the type of material available such as backfill, density requirements, and the configuration of the areas in which compaction is to be accomplished. *Table 5-1* below from the Department of the Army Technical Manual TM 5 -818 *Backfill for Subsurface Structures* gives a summary of the type of compaction equipment, number of coverage, and lift thickness for the specified degree of compaction of various soil types and applications. These requirements will be adequate in relation to most construction applications. In addition, the master plan for this area is for somebody to place an additional 2-3 feet of fill in order to bring the finished grade elevation above the 100-year flood zone to allow future development of the property. Therefore, the specified tight compaction control will be insignificant in relation to the planned future earthwork activities.

				Fill and Backfill				
				Typical Equipment and Procedures for Compaction				
Soil Group	Soil Types		Degree of Compaction	Equipment	No. of Passes or Coverages	Comp. Lift Thick., in.	Placement Water Content	Field Control
Pervious (Free-Draining)	GW GP SW SP	Compacted	90 to 95% of CE 55 maximum density	Vibratory rollers and compactors	Indefinite	Indefinite	Saturate by flooding	Control tests at intervals to determine degree of compaction or relative density
				Rubber-tired roller[b]	2-5 coverages	12		
			75 to 85% of relative density	Crawler-type tractor[c]	2-5 coverages	8		
				Power hand tamper[d]	Indefinite	6		
		Semicompacted	85 to 90% of CE 55 maximum density	Rubber-tired roller[b]	2-5 coverages	14	Saturate by flooding	Control tests as noted above, if needed
				Crawler-type tractor[c]	1-2 coverages	10		
			65 to 75% of relative density	Power hand tamper[d]	Indefinite	8		
				Controlled routing of construction equipment	Indefinite	8-10		
Semipervious and Impervious	GM GC SM SC ML CL OL OH MH CH OH	Compacted	90 to 95% of CE 55 maximum density	Rubber-tired roller[b]	2-5 coverages	8	Optimum water content	Control tests at intervals to determine degree of compaction
				Sheepsfoot roller[e]	4-8 passes	6		
				Power hand tamper[d]	Indefinite	4		
		Semicompacted	85 to 90% of CE 55 maximum density	Rubber-tired roller[b]	2-4 coverages	10	(A) Optimum water content (B) By observation; wet side-maximum water content at which material can satisfactorily operate, dry side-minimum water content required to bond particles and which will not result in voids or honeycombed material	(A) Control tests as noted above, if needed (B) Field control exercised by visual inspection of action of compacting equipment
				Sheepsfoot roller[e]	4-8 passes	8		
				Crawler-type tractor[c]	3 coverages	6		
				Power hand tamper[d]	Indefinite	6		
				Controlled routing of construction equipment	Indefinite	6-8		

VALUE ENGINEERING RECOMMENDATION # 6

SKETCH OF ORIGINAL DESIGN



<u>0'-2' PCB & SVOC Excavation to be backfilled in compacted 6" lifts:</u> 27,500 CY or 41,200 SY

<u>2'-5' PCB & SVOC Excavation to be backfilled in compacted 6" lifts:</u> 10,200 CY or 10,200 SY

Soil excavated within 20' of the building estimated to be 4,700 CY; however, backfill of this excavated area was not included in the original estimate dated 10/3/07.

Soil excavated beneath the floor estimated to be 21,500 CY; however, backfill of this excavated area was not included in the original estimate dated 10/3/07.

VALUE ENGINEERING RECOMMENDATION # 6

Unit Price Adjustment Factor Calculation

Excavation (0'-2')			
Area(SY)	41,200		
Volume (CY)	27,467		
AE Estimate to Backfill Imported Fill ($x.xx/CY)	$20.32		
Import Fill ($x.xx/CY)	$8.38		
Spread dumped fill without compaction ($x.xx/SY)	$1.95		
Compact & Test ($x.xx/SY)	$0.04		
Lift Thickness	# of Lifts	Cost w/ compaction	Cost w/o compaction
6" (Original Design)	4	$327,952	$321,360
8"	3	$245,964	$241,020
12"	2	$163,976	$160,680
Excavation (2'-5')			
Area(SY)	10,200		
Volume (CY)	10,200		
Spread dumped fill without compaction ($x.xx/SY)	$1.95		
Compact & Test ($x.xx/SY)	$0.04		
Lift Thickness	# of Lifts	Cost w/ compaction	Cost w/o compaction
6" (Original Design)	5	$101,490	$99,450
8"	4	$81,192	$79,560
12"	3	$60,894	$59,670
8" Lift Cost Savings Factor		76.18%	74.65%
12" Lift Cost Savings Factor		52.36%	51.31%

VALUE ENGINEERING RECOMMENDATION # 6

				Num of Units	Total $	Num of Units	Total $
Phase 1 Import Backfill	CY	$20.32	A	14,667	$298,033		$0
Spread & Compact 6" Lift	CY	$11.94	B	14,667	$175,124		$0
Spread & Compact 8" Lift	CY	$9.10	B		$0	14,667	$133,409
Spread & Compact 12" Lift	CY	$6.27	B		$0	14,667	$91,925
Spread Fill 6" Lift	CY	$11.82	B		$0	14,667	$173,364
Spread Fill 8" Lift	CY	$8.91	B		$0	14,667	$130,730
Spread Fill 12" Lift	CY	$6.13	B		$0	14,667	$89,856
Phase 2 Import Backfill	CY	$20.32	A	16,000	$325,120		$0
Spread & Compact 6" Lift	CY	$11.94	B	16,000	$191,040		$0
Spread & Compact 8" Lift	CY	$9.10	B		$0	16,000	$145,534
Spread & Compact 12" Lift	CY	$6.27	B		$0	16,000	$100,280
Spread Fill 6" Lift	CY	$11.82	B		$0	16,000	$189,120
Spread Fill 8" Lift	CY	$8.91	B		$0	16,000	$142,611
Spread Fill 12" Lift	CY	$6.13	B		$0	16,000	$98,023
Mark-up		75.40%	A				
Spread & Compact 6" Lift					$276,088		$0
Spread & Compact 8" Lift					$0		$210,324
Spread & Compact 12" Lift					$0		$144,923
Spread Fill 6" Lift					$0		$273,313
Spread Fill 8" Lift					$0		$206,099
Spread Fill 12" Lift					$0		$141,661
Total							
Spread & Compact 6" Lift					$642,252		$0
Spread & Compact 8" Lift					$0		$489,267
Spread & Compact 12" Lift					$0		$337,128
Spread Fill 6" Lift					$0		$635,797
Spread Fill 8" Lift					$0		$479,441
Spread Fill 12" Lift					$0		$329,539

Source Code

A — From A/E October 2007 30% Design Estimate

B — Engineer Estimated based on Means, A/E 30% Estimate and Professional jusgement. Price estimate based on applying Adjustment Factor calculated above.

VALUE ENGINEERING RECOMMENDATION # 7

PROJECT: Outboard Marine Corporation Superfund Site
LOCATION: Waukegan, Illinois
STUDY DATE: October 16-18, 2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Turn over the entire project to the City or their Developer.

Creative Idea 29.

ORIGINAL DESIGN:

The original plan called for the EPA to design, bid, and oversee the project.

RECOMMENDED CHANGE:

The recommended change would be for the EPA to design the project then turn it over to the City's developer to implement the ROD and design with the EPA providing oversight.

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

VALUE ENGINEERING RECOMMENDATION # 7

ADVANTAGES:

- Shorter period for remediation.
- Simplifies bureaucracy.
- Has been done at another location.
- Leads to redeveloping the site sooner.
- There is an incentive for the developer to find ways to save money.

DISADVANTAGES:

- Entering into contractual order with the EPA (consent decree).
- Perception that the site will not be cleaned to the same standards.
- EPA loses control.
- Developer could fail, and it would return to the EPA.
- The clean-up cost might exceed the land value to a developer (29 Acres of developable property).

JUSTIFICATION:

Remediates the site and redevelops the site for the least cost in the shortest amount of time with little or no cost to the EPA.

VALUE ENGINEERING RECOMMENDATION # 8

PROJECT: Outboard Marine Corporation Superfund Site
LOCATION: Waukegan, Illinois
STUDY DATE: October 16-18, 2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Leave 14,000 cubic yards stockpile and dispose in existing eastern cell.

Creative Idea 31.

ORIGINAL DESIGN:

The design includes removal of the 14,000 cubic yards stockpile and off-site disposal as non-TSCA soils.

Approximate Cost: $770,000
14,000 CY of soil removal (loading, transportation, and non-TSCA disposal) @ $55/CY = $770,000

RECOMMENDED CHANGE:

Consolidate the non-TSCA soils into the existing eastern containment cell. This would require removing the existing cover material, placing the 14,000 CY, install a new liner, place soil cover material, and place vegetative cover. Cost includes removal of the cul-de-sac along the access road.

Approximate Cost: $761,300
400 SY of concrete road removal @ $ 5/SY = $2,000
Remove cover material (assumes 250 x 500 x 2ft): 9,200CY @ $4/CY = $36,800
Placement of 14,000 CY (loading, transportation, and placement) @ $8/CY = $112,000
Placement of liner and cover material: 3 acres @ $200,000/acre = $600,000
Vegetative cover: 3 acres @ $3,500/acre = $10,500

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$770,000	0	0
RECOMMENDED DESIGN	$761,300	0	0
ESTIMATED SAVINGS	$8,700	0	0

VALUE ENGINEERING RECOMMENDATION # 8

ADVANTAGES:

- Eliminate the fees associated with transportation and disposal.
- Offsite borrow materials (at minimal cost) will likely be available for constructing the required cover material.

DISADVANTAGES:

- The City currently provides operation and maintenance (O&M) for the existing containment cells. Incorporating more non-TSCA material onsite will increase the City's O&M costs.
- Illinois EPA is currently mandating that the consolidation of materials on-site meet the subtitle D landfill requirements.
- Consolidation of additional materials on-site may produce constraints on the future developments.
- The goal would be to minimize the height of, and maintain an aesthetic appearance of, the soil pile on the east containment cell. This may likely require removal of portions of the eastern access road. The road was built on the east containment cell.
- Would need to remove the existing cover material prior to placement of the soil, and install a new liner and place the cover material.

JUSTIFICATION:

With the estimated unit rates (which will be even lower when competitively bid) and the IEPA subtitle D requirement, it does not appear that on-site consolidation produces significant cost savings.

VALUE ENGINEERING RECOMMENDATION # 9

PROJECT: Outboard Marine Corporation Superfund Site
LOCATION: Waukegan, Illinois
STUDY DATE: October 16-18, 2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Utilize the services of private laboratory services, or utilize the services of U.S. EPA’s contract lab program.

Creative Idea 36.

RECOMMENDED CHANGE:

Utilize the services of an on-site lab complete with a dedicated chemist.

ADVANTAGES:

- Quick “turn-a-round” time.
- More control (prioritization).
- Capacity should not be as much of an issue.
- Project management has control.
- Quicker decisions can be made, particularly true with the soil under the building, and the wipe samples.
- Total number of samples can perhaps be reduced.

DISADVANTAGES:

- Perhaps limited on the number of samples that can be run (1 GC).
- Proper level of QA/QC might be difficult to achieve.
- Perdiem for chemist.
- As many as 10% of samples will have to be sent off-site for confirmation.
- Equipment breakdown might occur more frequently.

VALUE ENGINEERING RECOMMENDATION # 9

JUSTIFICATION:

Dealing with laboratories can be taxing even under the best of circumstances. But when decisions have to be made on a real time basis, excuses such as “we can’t find the samples”, “our GC broke down”, or “the chemist is sick” will cause delays and cost money. It is true that problems can and will arise with an on-site lab. However, those problem will be a priority for the lab’s “only customer” to get fixed and not have to rely on conversations from a lab spokesperson perhaps many miles away to make decisions.

Having an on-site lab will also cause its capacity to be used in a manner that is consistent with the project management’s priorities and this could lead to a significant reduction in the number of samples being analyzed.

It’s hard to compare time savings with dollars, but the likelihood is that an on-site lab will save money with analytical costs and save time in allowing real time decisions to be made.

VALUE ENGINEERING RECOMMENDATION # 10

PROJECT: Outboard Marine Corporation Superfund Site
LOCATION: Waukegan, Illinois
STUDY DATE: October 16-18, 2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Send contaminated steel directly to a certified smelter for recycling.

Creative Ideas 6, 24 and 38.

ORIGINAL DESIGN:

Original Design calls for taking down the structural elements of the building and recycling building material to the extent possible.

The set of assumptions upon which this design was based includes:

- Sand blasting to strip the paint off of painted surfaces would not be necessary.
- Decontamination would be conducted only on a cursory basis with steam cleaning or similar method followed by wipe sampling.
- The low bidding contractor would make the determination whether recycling was ultimately in his interest – both financially and administratively.

RECOMMENDED CHANGE:

Based upon existing regulations (details in “Justification” below), the contaminated steel may be recycled and sent directly to a certified smelter for melting in “as-is” condition, regardless of PCB contamination concentrations and the presence of lead-based paint.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$2,196,000	0	$2,196,000
RECOMMENDED DESIGN	$712,000	0	$712,000
ESTIMATED SAVINGS	$1,484,000	0	$1,484,000

VALUE ENGINEERING RECOMMENDATION # 10

ADVANTAGES:

- Significant cost savings.
- Simplifies and reduces remedial action schedule.
- Opportunity to recycle steel materials.

DISADVANTAGES:

- Potential increased cost of shipping and transportation.

JUSTIFICATION:

TSCA allows for decontamination of metal surfaces in PCB bulk product waste, from which all free-flowing liquids have been removed, in a scrap metal recovery oven or approved smelter, regardless of PCB contamination concentrations, as per 40 CFR 761.72, provided below:

40 CFR 761.72.

Sec. 761.72 Scrap metal recovery ovens and smelters.

Any person may dispose of residual PCBs associated with PCB-Contaminated articles regulated for disposal under Sec. 761.60(b), metal surfaces in PCB remediation waste regulated under Sec. 761.61, or metal surfaces in PCB bulk product waste regulated under Secs. 761.62(a)(6) and 761.79(c)(6), from which all free-flowing liquids have been removed:

(a) In a scrap metal recovery oven:

(1) The oven shall have at least two enclosed (i.e., negative draft, no fugitive emissions) interconnected chambers.

(2) The equipment with all free-flowing liquid removed shall first be placed in the primary chamber at room temperature.

(3) The primary chamber shall operate at a temperature between 537 Cº and 650 Cº for a minimum of 2 1/2 hours and reach a minimum temperature of 650 Cº (1,202 Fº) once during each heating cycle or batch treatment of unheated, liquid-free equipment.

(4) Heated gases from the primary chamber must feed directly into the secondary chamber (i.e., afterburner) which must operate at a minimum temperature of 1,200 Cº (2,192 Fº) with at least a 3 percent excess oxygen and a retention time of 2.0 seconds with a minimum combustion efficiency of 99.9 percent according to the definition in Sec. 761.70(a)(2).

(5) Heating of the primary chamber shall not commence until the secondary chamber has reached a temperature of 1,200 ± 100 Cº (2,192 ± 180 Fº).

(6) Continuous emissions monitors and recorders for carbon dioxide, carbon monoxide, and excess oxygen in the secondary chamber and continuous temperature recorders in the primary and secondary chambers shall be installed and operated while the primary and secondary chambers are in operation to assure that the two chambers are within the operating parameters in paragraphs (a)(3) through (a)(5) of this section.

VALUE ENGINEERING RECOMMENDATION # 10

(7) Emissions from the secondary chamber shall be vented through an exhaust gas stack in accordance with valid State and local air regulations and permits, which include a standard for PCBs or meets the standards in paragraph (a)(8) of this section.

(8) Exhaust gas stack emissions shall be for: particulates <0.015 grains/dry standard cubic foot, sulfur dioxide <35 parts per million by volume (ppmv), nitrogen oxide <150 ppmv, carbon monoxide <35 ppmv, and hydrogen chloride <35 ppmv.

(9) A measurement of the temperature in the secondary chamber at the time the primary chamber starts heating must be taken, recorded and retained at the facility for 3 years from the date each charge is introduced into the primary chamber.

(b) By smelting:

(1) The operating temperature of the hearth must be at least 1,000 Cº at the time it is charged with any PCB-Contaminated non-porous surface.

(2) Each charge containing a PCB-Contaminated item must be added into molten metal or a hearth at ≥1,000 Cº.

(3) Successive charges may not be introduced into the hearth in less than 15-minute intervals.

(4) The smelter must operate in compliance with any applicable emissions standards in part 60 of this chapter.

(5) The smelter must have an operational device which accurately measures directly or indirectly, the temperature in the hearth.

(6) Take, record and retain at the disposal facility for 3 years from the date each charge is introduced, a reading of the temperature in the hearth at the time it is charged with a non-porous surface item.

(c)(1) Scrap metal recovery ovens and smelters must either have a final permit under RCRA (part 266, subpart H of this chapter and Sec. 270.66 of this chapter) or be operating under a valid State air emissions permit which includes a standard for PCBs.

(2) Scrap metal recovery ovens and smelters disposing of PCBs must provide notification as disposers of PCBs, are not required to submit annual reports, and shall otherwise comply with all applicable provisions of subparts J and K of this part, as well as other applicable Federal, State, and local laws and regulations.

(3) In lieu of the requirement in paragraphs (a) and (b) of this section, upon written request by the owner or operator of a scrap metal recovery oven or smelter, the EPA Regional Administrator, for the Region where the oven or smelter is located, may make a finding in writing, based on a site-specific risk assessment, that the oven or smelter does not pose an unreasonable risk of injury to health or the environment because it is operating in compliance with the parameters and conditions listed in paragraphs (a)(1) through (a)(8) and (b)(1) through (b)(9) of this section even though the oven or smelter does not have a RCRA or State air permit as required by paragraph (c)(1) of this section. The written request shall include a site-specific risk assessment.

(d) PCB liquids, other liquid waste qualifying as waste oils which may be used as provided for at Sec. 761.20(e), or PCB remediation waste, other than PCB-Contaminated articles, may not be disposed of in a scrap metal recovery oven or smelter unless approved or otherwise allowed under subpart D of this part.

VALUE ENGINEERING RECOMMENDATION # 10

A list of PCB potential scrap metal recovery ovens can be found at:

http://www.epa.gov/epaoswer/hazwaste/pcbs/pubs/oven.htm
The following companies have advised EPA that they comply with the requirements for scrap metal recovery ovens at 40 CFR 761.72(a). To determine whether EPA has verified compliance, contact the Regional PCB Coordinators.

Company: Environmental Protection Services
Address: 4 Industrial Park Drive
P.O. Box 710
Wheeling, WV 26003
Phone: 304-232-1590
FAX: 304-232-1599

Company: Transformer Disposal Specialists, Inc.
Address: PO Box 428
Tonkawa, OK 74653
Phone: 580-628-5371
FAX: 580-628-2961

Company: Transformer Salvage, Inc.
Address: PO Box 888
Dudley, NC 28333
Phone: 919-731-7732
FAX: 919-736-3348

Company: G & S Technologies
Address: 1800 Harrison Avenue
Kearny, NJ 07032
Phone: 201-998-9244
FAX: 201-998-3349

Company: Solomon Corporation
Address: 103 W. Main St.
Solomon, KS 67480
Phone: 785-655-2191

Company: Trans Ind Corporation
Address: 2031 Westwood Avenue
Richmond, VA 23230
Phone: 804-358-8200
FAX: 804-359-3726

VALUE ENGINEERING RECOMMENDATION # 10

Company: Clean Harbors (PPM)
Address: 1672 E. Highland Road
Twinsburg, OH 44087
Phone: 330-425-3825
FAX: 330-487-5784

Lead-Based Paint Issue:

http://www.environmental.usace.army.mil/94-04.html

Scrap metal which is recycled is exempt from RCRA hazardous waste regulation by a well known exclusion in 40 CFR 261.6(a)(3)(iii). Because of this exclusion, recycled scrap metal is not subject to RCRA generator; transporter; or treatment, storage and disposal (TSD) facility requirements. In other words, even if the scrap metal inherently contains toxic metals, because it is specifically exempt, RCRA hazardous waste accumulation restrictions do not apply, the scrap metal does not have to be manifested when it leaves the site, and the facility recycling the scrap metal does not have to be permitted as a hazardous waste TSD facility provided the metal is being recycled. At most, the shipment may require a bill of lading not because of RCRA, but rather because of Department of Transportation requirements.

Generators of scrap metal must be cautious when applying this exclusion, however, because frequently the scrap metal is not the sole component of the waste stream. 40 CFR 261.1(c)(6) defines scrap metal as "bits and pieces of metal parts (e.g., bars, turnings, rods, sheets, wire) or metal pieces that may be combined together with bolts or soldering which when worn or superfluous can be recycled". If the entire waste stream does not meet this definitions, such as when metal piping contains residues of hazardous constituents or is painted with lead-based paint, only the scrap metal portion of the waste is covered by the 40 CFR 261.6(a)(3)(iii) exclusion, not the non-scrap metal component. So must scrap metal always be decontaminated before it is sent for recycling? Not necessarily. A less well known conditional exemption in the boiler and industrial furnace regulations, 40 CFR266.100(c), provides some relief. Under certain circumstances this exemption allows smelting, melting, and refining furnaces to accept contaminated metals for material recovery purposes without triggering treatment permit requirements. EPA has imposed conditions to ensure that furnaces are truly being used for metals recovery and not for other purposes.

The waste must be < 5,000 BTU/lb. The assumption is that if BTU values exceed this limit, the waste is being burned at least partially for destruction or energy recovery purposes rather than solely for metals recovery. The waste must have < 500 ppm by weight total organic constituents listed in 40 CFR 261 Appendix VIII. Persons operating the furnace must keep records documenting the wastes meet the BTUs and total organic constituent thresholds, the wastes contain recoverable levels of metals, and the device used for recovery is indeed engaged in producing a metal product for public use (56 FR 7143 and 40 CFR 261.2(f)). There are special requirements for lead and nickel-chromium recovery furnaces which include restrictions on burning of wastes which exhibit the toxicity characteristic for organic (non-metal) constituents. See 40 CFR 266.100(c)(3) for additional details.

Even if utilizing the furnace exemption, it is important that generators determine whether their waste is hazardous because:
If hazardous waste, hazardous waste management requirements still apply prior to burning. The exemption applies only to the metal recovery operation itself, not to related generation, transportation, or storage activities. So even though a permit is not required for the recovery process itself, hazardous waste storage activities must be permitted. Manifests and land disposal restriction notification forms will also be required. Residues from metal recovery operations involving hazardous waste are not excluded. If metals are being recovered from listed waste, the "derived-from rule" could require residues to be managed as hazardous. (40 CFR 266.112, 56 FR 7144).

Though state programs must be consistent with the Federal requirements, RCRA authorized states may have more stringent requirements. Individual state regulations should be consulted before exercising either of these exclusions.

VALUE ENGINEERING RECOMMENDATION # 10

Cost Estimate

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
Building Decontamination							
- Pressure Wash	LS	467,000.00		1	$467,000	0	$0
- Sand Blast Steel	LS	401,000.00		1	$401,000	0	$0
Transportation & Disposal > 50 ppm	Ton	160.00		2,400	$384,000		
Transportation to Smelter: (assume 500 miles to smelter, for 2400 Tons. Assume 15 tons per truck = 160 loads. 160 x 1000 mi = 160,000 mi)	Mile	2.50				160,000	$400,000
Subtotal					$1,252,000		$400,000
Mark-ups		@	75.4%		$944,000		$301,600
Redesign Costs	LS			1		10,000	$10,000
Total					$2,196,000		$712,000

These items are numbered per the Creative Ideas list numbering

5. Investigate presence of slurry wall on south side of North Ditch.
It may be necessary to dewater the north ditch in order to facilitate excavation of sediments. In order to minimize groundwater recharge into the ditch, temporary sheet piles may be required to be installed in any gaps that may be present in the slurry wall.

8. Do not preclude option in contract to remove steel before it is decontaminated.
The final design specifications and subcontract documents should not preclude the option for the subcontractor to remove steel before it is decontaminated (i.e., decontamination on the ground rather than in-place).

10. Determine QA/QC responsibilities (plan) of decontamination work (see CFR 761.79).
40 CFR 761.79 establishes decontamination standards and procedures for removing PCBs, which are regulated for disposal, from water, organic liquids, non-porous surfaces (including scrap metal from disassembled electrical equipment), concrete, and non-porous surfaces covered with a porous surface, such as paint or coating on metal. Since the deconstruction process will be generating scrap steel (painted and non-painted) that will be recycled, the following are decontamination standards for non-porous surfaces in contact with liquid and non-liquid PCBs:

- For unrestricted use:
  - No Paint or Coating: For non-porous surfaces previously in contact with liquid PCBs at any concentration, where no free-flowing liquids are currently present, ≤10 micrograms PCBs per 100 square centimeters (≤ 10 µg/100 cm^2) as measured by a standard wipe test (§761.123) at locations selected in accordance with subpart P of this part.
  - Paint or Coating: For non-porous surfaces in contact with non-liquid PCBs (including non-porous surfaces covered with a porous surface, such as paint or coating on metal), cleaning to Visual Standard No. 2, Near-White Blast Cleaned Surface Finish, of the National Association of Corrosion Engineers (NACE). A person shall verify compliance with standard No. 2 by visually inspecting all cleaned areas.
- For disposal in a smelter operating in accordance with §761.72(b):
  - No Paint or Coating: For non-porous surfaces previously in contact with liquid PCBs at any concentration, where no free-flowing liquids are currently present, <100 µg/100 cm^2 as measured by a standard wipe test (§761.123) at locations selected in accordance with subpart P of this part.
  - Paint or Coating: For non-porous surfaces in contact with non-liquid PCBs (including non-porous surfaces covered with a porous surface, such as paint or coating on metal), cleaning to Visual Standard No. 3, Commercial Blast Cleaned Surface Finish, of the National Association of Corrosion Engineers (NACE). A person shall verify compliance with standard No. 3 by visually inspecting all cleaned areas.

Confirmatory sampling and record keeping are required. For non-porous surfaces, sampling must be accomplished in accordance with 40 CFR 761-subpart P. A written record of such sampling must be established and maintained for 3 years from the date of any decontamination. The record must show sampling locations and analytical results and must be retained at the site of the decontamination or a copy of the record must be made available to EPA in a timely manner, if requested. In addition, record keeping is required in accordance with §761.180(a) for all wastes generated by a decontamination process and regulated for disposal. Subpart P provides an aggressive sampling protocol including sample site selection procedures, analyzing the samples and interpreting the results of the sampling. A comprehensive Sampling and Analysis Plan, including record keeping requirements, is a key PBC standard to assure compliance. Furthermore, a standard operating procedure or material handling plan needs to be established for recycled steel to assure decontamination compliance/documentation before any shipment is released.

11. Determine TSCA requirements for soil confirmation samples to be collected below TSCA slab area
The number of proposed confirmation samples appears to be potentially high. The contractor should review available guidance on TSCA at the time of excavation to confirm sample quantities. A brief review of the guidance conducted as part of the VE study indicated the need to define the area of the spill (the release is being considered a spill for this purpose) as one foot beyond visible contamination or as determined by the results of statistically based sampling. Following removal post excavation samples should be collected inclusive of a 1 ft or +20% buffer zone. Sampling needs to be performed at the 95% confidence level with and estimate of variance due to analytical error calculated. A min of 3 samples and a max of 40 spls was called out. See **http://www.pca.state.mn.us/waste/pubs/4_48g.pdf** for summary. The contractor should also consult Illinois EPA for state specific guidance as well as cfr 761.130.

13. Do not preclude option to shred steel on-site.
The final design specifications and subcontract documents should not preclude the option for the subcontractor to shred the steel prior taking it offsite for disposal.

16. As part of contract, include requirements for Clean-up Cost Cap Insurance with or without Pollution Legal Liability Insurance.
Once the decision is made to proceed with PBC, the next step is to identify the scope of effort that will be included in the PWS, and then to determine whether Environmental Insurance (EI) will be included as part of the overall package. EI can be broadly delineated between Cleanup Cost Cap/Remediation Stop Loss Insurance (CCC) and Environmental Impairment Liability/Pollution Legal Liability (EIL/PLL) insurance coverage. The concept of FFP in environmental remediation arena has not necessarily meant that the work would be accomplished for a set price, but rather the work would be initiated for a set price and would more than likely be modified before the contractor completed the original scope of work. Through the use of EI, combined with PBCs, the risk of cost overruns and schedule creep can be reduced. Although the cost of EI can generally range from 6-15% of the project cost (for those activities requiring insurance), this still represents a reasonable and valuable tool because the cost to achieve an objective is known. History has shown that the cost to complete projects often exceed the original estimate by far more than the 6-15% insurance premium.

If the team can answer "yes" to any or all of these questions, consideration should be given to include CCC coverage in the PWS:

- *Are there significant cost uncertainties associated with achieving the performance objective?*
- *Is there significant risk of cost or schedule overrun associated with achieving the performance objective(s)?*
- *Is the anticipated award price for the insured components of the PWS greater than $2 million?*
- *Is the contract to be let full and open or competed among like size firms?*
- *Are we hoping to encourage use of innovated technologies?*
- *Is the financial risk to the contractor substantial?*

If the team can answer "yes" to any of these questions, consideration should be given to include EIL/PLL coverage in the PWS:

- *Is the off-site transport and disposal of waste likely?* If yes, the team should consider either specially modified PLL or CPL insurance covering non-owned disposal sites because of the following:
  - *Liability for Off site disposal will be excluded under the cost cap.*
  - *Claims related to off site disposal will be considered a third party claim.*
  - *Non-owned disposal site coverage should be inexpensive.*
- *Are we seeking regulatory closure (i.e., Response Complete) as the performance objective for some or all of the sites in the PWS?*
- *Are we confident in our characterization of the sites included in the PWS?*

17. Establish objectives, milestones, and standards.
Performance-Based Services Acquisition (PBSA) involves acquisition strategies, methods, and techniques that describe and communicate measurable outcomes rather than directed performance processes. Simply put, it is a method for acquiring *what is required* and placing responsibility for *how it is accomplished* on the contractor. To be considered performance-based, an acquisition should contain, at a minimum, the following elements:

- Performance work statement: Describe the requirement in terms of measurable outcomes rather than by means of prescriptive methods.
- Measurable performance standards: To determine whether performance outcomes have been met, defines what is considered acceptable performance.
- Remedies: Procedures that address how to manage performance that does not meet performance standards.
- Performance Assessment Plan: Describe how contractor performance will be measured and assessed against performance standards. (Quality Assurance Plan or Quality Assurance Surveillance Plan)

Before developing a performance work statement, a market research should be conducted to obtain information about alternative solutions that maybe available from the marketplace today. This information is needed in order to determine the suitability of the marketplace for satisfying a need or requirement. It is also useful in developing, validating, and refining Performance Requirements Summary or the performance work statement.

20. Off-site disposal waste soil sampling frequency (need to reevaluate).

Commentary: Soil waste characterization samples are currently proposed at a frequency of one sample per 50,000 ft2 of excavation area. The sampling frequency should be re-evaluated to provide the landfill with an accurate representation of the materials that will be disposed.

21. Retain east road for Phase II work.
Consider retaining the east road for Phase II work efforts. The existing road is in good condition and would serve as a good all weather access road to the site. Dust control would also be minimized.

25. Make RI/FS, boring logs, available to contractors.
Commentary: The Remedial Investigation Report (e.g., boring logs and analytical results) and Feasibility Study Report need to be made available to the potential subcontractors as part of the design bid package.

26. Investigate concrete tunnels for TSCA contamination.
The post-demolition activities need to include an investigation of the concrete tunnels that will be exposed after slab removal to evaluate removal/disposal options.

30. Do we need to have performance bond (screening)?
A performance bond guarantees the owner that the principal will complete the contract according to its terms including price and time. The owner is the obligee of a performance bond, and may sue the principal and the surety on the bond. If the principal defaults, or is terminated for default by the owner, the owner may call upon the surety to complete the contract. Many performance bonds give the surety three choices: completing the contract itself through a completion contractor (taking up the contract); selecting a new contractor to contract directly with the owner; or allowing the owner to complete the work with the surety paying the costs. The penal sum of the performance bond usually is the amount of the prime construction contract, and often is increased when change orders are issued. The penal sum in the bond usually is the upward limit of liability on a performance bond. However, if the surety chooses to complete the work itself through a completing contractor to take up the contract then the penal sum in the bond may not be the limit of its liability. The surety may take the same risk as a contractor in performing the contract.

PAYMENT BONDS
A payment bond guarantees the owner that subcontractors and suppliers will be paid the monies that they are due from the principal. The owner is the obligee; the “beneficiaries” of the bond are the subcontractors and suppliers. Both the obligee and the beneficiaries may sue on the bond. An owner benefits indirectly from a payment bond in that the subcontractors and suppliers are assured of payment and will continue performance. On a private project, the owner may also benefit by providing subcontractors and suppliers a substitute to mechanics’ liens. If the principal fails to pay the subcontractors or suppliers, they may collect from the principal or surety under the payment bond, up to the penal sum of the bond. Payments under the bond will deplete the penal sum. The penal sum in a payment bond is often less than the total amount of the prime contract, and is intended to cover anticipated subcontractor and supplier costs.

A Risk Management Model should be developed to compare “Probability of Loss” to “Magnitude of Impact” in order to make an informed decision. If this model justifies performance and payment bonds to be waived, then other options such as bank letters of credit should be explored. In any event, the "Best Value Procurement" process should develop a source selection criterion to capture and evaluate the following:

- Character: Looks at such intangibles as the quality and integrity of owners and management.
- Capital: Looks at the relative financial strength of the contractor and includes many factors in the calculation of tangible working capital and equity.
- Capacity: Once the tangible working capital and equity amounts are determined, normal surety underwriting standards are applied to calculate a "not to exceed" capacity limit that is typically expressed as an upper limit of backlog cost to complete.

If the Risk Management Model justifies performance and payment bonds, the "Best Value Procurement" process should focus on the experience portion of the prequalification effort to determine "best value" and utilize surety performance and payments bonds to determine financial qualified bidders. Another factor that the Risk Management Model should take into account is the proposed contract type. For example, a Cost-Plus-Fixed-Fee or other type of Cost-Plus may not justify performance and payment bonds.

Whatever final decision is made for a particular contracting action, a determination should be made to establish if performance and payment bonds waivers are allowable under Federal, State, and Local regulations.

33. Consider purchasing equipment as expendable in lieu of rental rate, where rental cost over the life of the project exceeds the purchase price.
This comment would probably only apply to air monitoring equipment, certain hand tools, and perhaps vehicles (pick-up trucks) and ATV's (all terrain vehicles), and other small items where it is fairly certain that the long term nature of the project will cause the rental rate to exceed individual purchase prices. Although the cost savings of such a contract clause will probably not result in significant savings, it would certainly exhibit a willingness on behalf of the contractor to investigate all additional cost saving ideas.

35. Re-evaluate level of QA/QC for lab work.
Designer will re-evaluate level of QA/QC required for the lab work. There could be potential cost savings if a lower QA/QC level is acceptable.

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

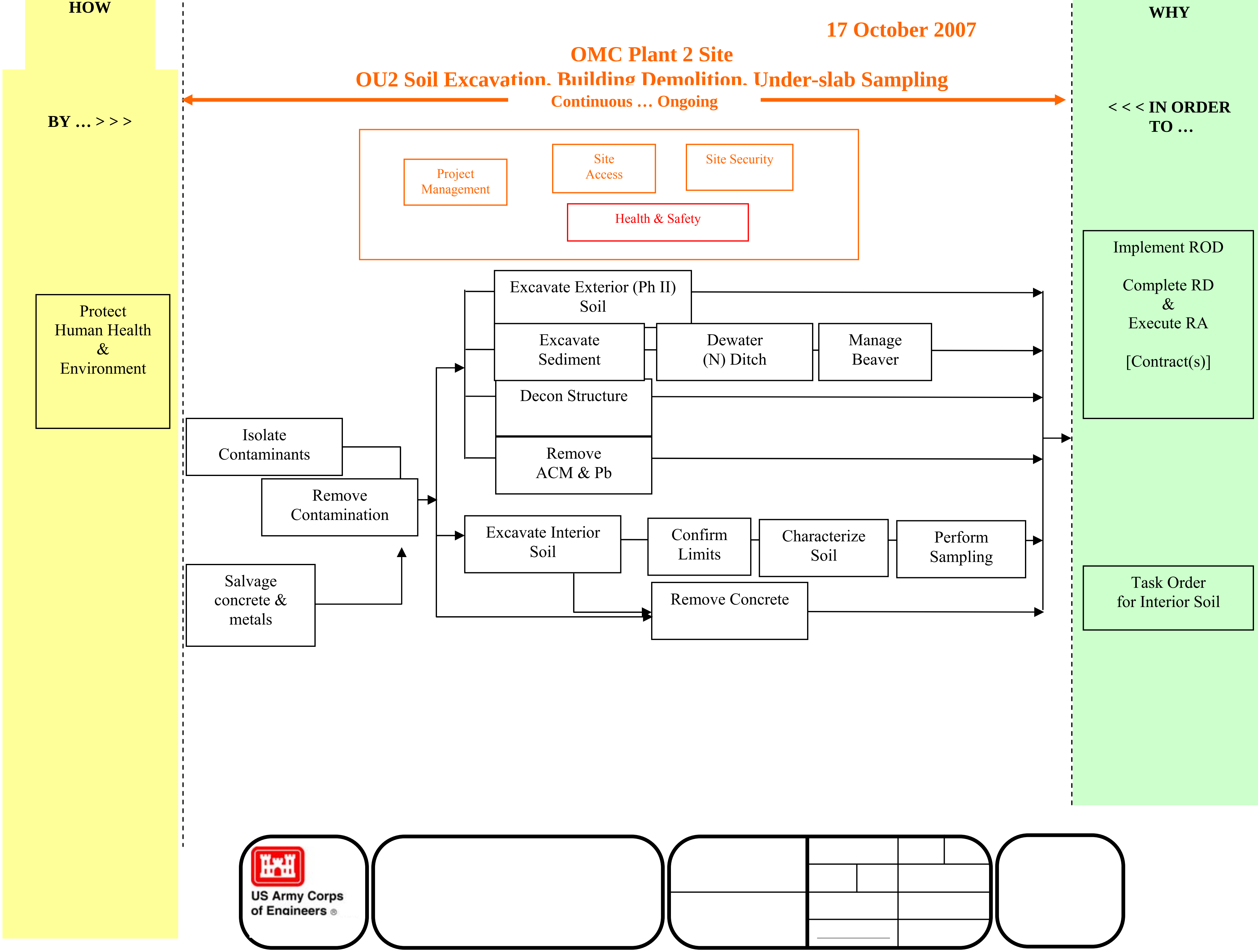
Attendees					
Outboard Marine Corporation Superfund Site October 16-18, 2007					
Name	**Firm/Agency**	**Phone**	**Oct 16**	**Oct 17**	**Oct 18**
Ken True	Contractor	402-516-2635	Yes	Yes	Yes
Curtis Payton	USACE	916-557-7431	Yes	Yes	Yes
Rich Block	CH2M Hill	414-847-0410	Yes	Yes	Yes
James Harbert	USACE	570-895-7052	Yes	Yes	Yes
J. Keiser	CH2M Hill	414-847-0469	Yes	Yes	Yes
John Hartley	USACE Rapid Response	402-293-2523	Yes	Yes	Yes
Kevin Adler	US EPA	312-886-7078	Yes	Yes	No
Ken Theisen	US EPA	312-886-1959	Yes	Yes	Yes
Greg Mellema	USACE	402-697-2658	Yes	Yes	Yes
John Moore	City of Waukegen	847-456-4920	Yes	Yes	Yes
Erin Rednour	State of Illinois EPA	217-785-8725	Site Visit	No	No

<u>APPENDIX B</u>
CREATIVE IDEAS LIST

List of CREATIVE IDEAS			
Idea Category: OMC Superfund Site 16-18 Oct 2007 **R=Recommendation D=Design Comment E=Eliminate WD=Withdrawn**			
ID #	**Name of Idea / description**	**Value Potential**	**Developed By**
1	Reuse sand (14,000 cy pile) for asphalt mix	R	John M
2	Provide on-site consolidated storage (non TSCA materials) facility (FS 3b & 3s) – combine with 31	R	Rich
3	Combine lead and asbestos work, concurrent with PCB decon (phase TBD)	R	J Hartley
4	Combine all contaminant removal (including decon work) except slab and under slab soils in one contract (4 & 23)	R	J Hartley/KT
5	Investigate presence of slurry wall on south side of N ditch	D	GM
6	Use of smelting operation to handle steel, decon as practical, send rest to smelter for remelt. (combine 6 & 24)	R	CP
7	Reevaluate order of work. Do building demo prior to soil removal work (as funding allows). (Address most contaminated materials first)	R	J. Hartley
8	Do not preclude option in contract to remove steel before it is decon'd	D	JK
9	Evaluate dry ice decon vs. conventional methods for steel	E	-
10	Determine QA/QC responsibilities (plan) of decon work (see CFR 761.79)	D	J Harbert
11	Determine TSCA requirements (# of samples) for soil confirmation sampling under TSCA concrete slab	D	J Hartley
12	Do not decon steel & send off-site (as haz waste)	R	CP
13	Do not preclude option to shred metal on-site	D	JK
14	Decon building as required and turn over to City for building demolition. Seal slab after demolition if necessary	E	-
15	Lump-Sum Performance based contract for building removal as is.	E	-
16	As part of contract, include requirements for Clean-up Cost Cap Insurance with or without Pollution Legal Liability Insurance	D	J Harbert
17	Establish objectives, milestones, and standards	D	J Harbert
18	Sample under east road to determine if soil underneath pavement is contaminated. (trench along side of road & sample)	R	Rich
19	Relax compaction requirements	R	J Harbert
20	Off-site disposal waste soil sampling frequency (need to	D	JK

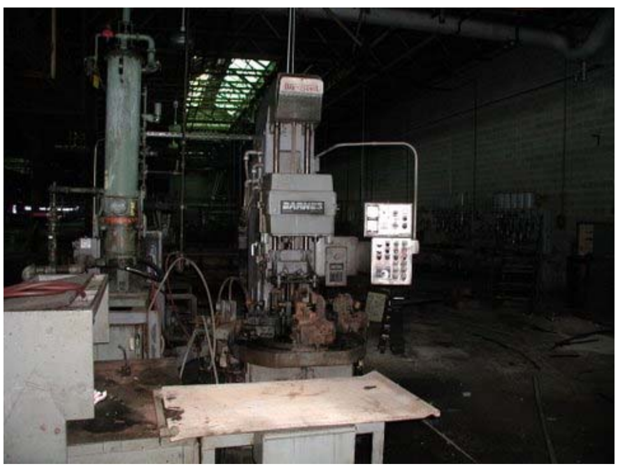
List of CREATIVE IDEAS			
Idea Category: OMC Superfund Site 16-18 Oct 2007 **R=Recommendation D=Design Comment E=Eliminate WD=Withdrawn**			
ID #	**Name of Idea / description**	**Value Potential**	**Developed By**
	reevaluate)		
21	Retain east road for phase II work	D	GM
22	Sample, decon and remove equipment left in building	E	-
23	Evaluate the cost of phased funding (combine w/ 4)	R	K True
24	Investigate Federal & State Regs regarding salvage of lead based painted materials (steel) (related to 6)	D	CP
25	Make RI/FS, boring logs, available to contractors	D	JK
26	Investigate concrete tunnels for TSCA contamination	D	JK
27	Evaluate excavating North Ditch without dewatering	E	-
28	Consider wet decon or scarifying top of non-TSCA concrete	E	-
29	Turn over entire project to City	R	John
30	Do we need to have performance bond (screening)	D	J Harbert
31	Leave 14000 cy stockpile and dispose in existing eastern cell (combine with 2)	R	Rich
32	Westin summary of PCB disposal (defining waste – Curtis)	E	-
33	Consider purchasing equipment as expendable in lieu of rental rate, where rental cost over the life of the project exceeds purchase price	D	K Theisen
34	Increase thickness of lifts for imported compaction requirements	E	-
35	Reevaluate level of QA/QC for lab work	D	Rich
36	Utilize on-site lab	R	K Theisen
37	Use City's lab	E	-
38	Pursue agreement/interpretation of regulations with EPA regarding decon requirements for steel (combine with 6)	R	CP

APPENDIX C
FUNCTION ANALYSIS SYSTEM TECHNIQUE (FAST) DIAGRAM


HOW
WHY
17 October 2007
OMC Plant 2 Site
OU2 Soil Excavation, Building Demolition, Under-slab Sampling
Continuous … Ongoing
BY … > > >
< < < IN ORDER TO …
Project Management
Site Access
Site Security
Health & Safety
Protect Human Health & Environment
Implement ROD
Complete RD & Execute RA
[Contract(s)]
Task Order for Interior Soil
Excavate Exterior (Ph II) Soil
Excavate Sediment
Dewater (N) Ditch
Manage Beaver
Decon Structure
Remove ACM & Pb
Isolate Contaminants
Remove Contamination
Salvage concrete & metals
Excavate Interior Soil
Confirm Limits
Characterize Soil
Perform Sampling
Remove Concrete
US Army Corps of Engineers

This page intentionally left blank.

APPENDIX D
PHOTOGRAPHS


BARNES


CAP. 1 TON

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
LTTD	Low Temperature Thermal Desorption

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

Team Leader and USACE Resumes

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

Summary

Seven 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

James M. Harbert
U.S. Army Corps of Engineers, Baltimore District
Northeast Resident Office
Work: 570-895-7052
Mobile: 570-840-2929
Jim.Harbert@usace.army.mil

Summary

As Team Leader for the Hazardous, Environmental, and Toxic Waste section of a Resident Office, I manage a team of Project Engineers and Construction Representatives responsible for the administration of Superfund and other environmental cleanup projects throughout Eastern Pennsylvania. I analyze future workloads and prepare budgets to assure my team is properly manpowered to meet future needs. I direct the review and analysis of administrative and technical contractor submittals, technical problem resolution, modification analysis and scope of work development, and contract progress evaluation. I review and interpret the requirements of plans and specifications for subordinate personnel direct surveillance of construction contracts and maintain liaison with participants in discussion with regulatory and customer agencies. The environmental field has required my team to be proficient in innovative technologies, nonstandard contractual mechanisms and to be attentive to public relationship concerns associated with high profile projects. (Supervisor's Name: James P. Moore. Phone 570-895-7052.)

Temporary assignments: I was the Resident Engineer and Contracting Officer Representative for the Northeastern Resident Office three times over the past 10 years. I exercised delegated responsibility for contract enforcement. Required skills included engineering, contract administration, construction inspection, office administration, personnel management, safety management and various government regulations, policies, and procedures applicable to the work. Types of projects included construction and rehabilitation of a wide variety of specialized and conventional structures and facilities with a focus on environmental cleanup, military construction, family housing renovation, and civil works such as the Wyoming Valley Levee raising project. (Supervisor's Name: Denis duBreuil. Phone 717-770-7312.)

Major Accomplishments

Lackawanna Refuse Superfund: The work involved the remediation of a hazardous waste landfill including a multilayer geosynthetic cap system, waste excavation/relocation, buried drum removal/disposal and a leachate collection system. All drums (8,000) and highly contaminated solid waste (40,000 cubic yards) disposed off-site.

Moyer Landfill Superfund: The work consists of the remediation of a 65 acres hazardous waste landfill including a multilayer geosynthetic cap system, waste excavation/ relocation, and a leachate collection.

Austin Avenue Radiation Superfund: This project consists of the reconstruction and/or remediation of twenty-one properties contaminated with radioactive materials that were located in five municipalities in Delaware County, PA. The warehouse property required excavation of radioactive contaminated soil up to 20 feet deep.

Strasburg Landfill Superfund: The work consists of the remediation of a that includes a multilayer cap over a hazardous waste landfill approximately 32 acres in area, waste excavation and relocation, leachate collection and treatment system, and a gas control and flare treatment system.

Havertown Superfund: This project involved a groundwater treatment plant construction under a design-build/cost-plus-fixed fee contract. The wastes were primarily oil contaminated with pentachlorophenol (PCP).

Education

BS, Civil Engineering, The Pennsylvania State University, University Park, PA

Registrations

Commonwealth of Pennsylvania Department of Bureau of Professional and Occupational Affairs, Professional Engineer

Gregory J. Mellema, Geotechnical Engineer
Geoenvironmental and Process Engineering Branch CENWO-HX-E
HTRW Center of Expertise
U.S. Army Corps of Engineers
Omaha, NE 68144-3869
(402) 697-2658 (v)
(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

I am the 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. Have 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.

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, landfill grading, .
- 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.
- Liaison between multiple contractors toward a common goal of site closure for Army RCRA and CERCLA sites.
- 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 ready to deploy in the event of a major earthquake.
- Installed over 100 wells in a wide variety of depositional environments.
- 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. 1930

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