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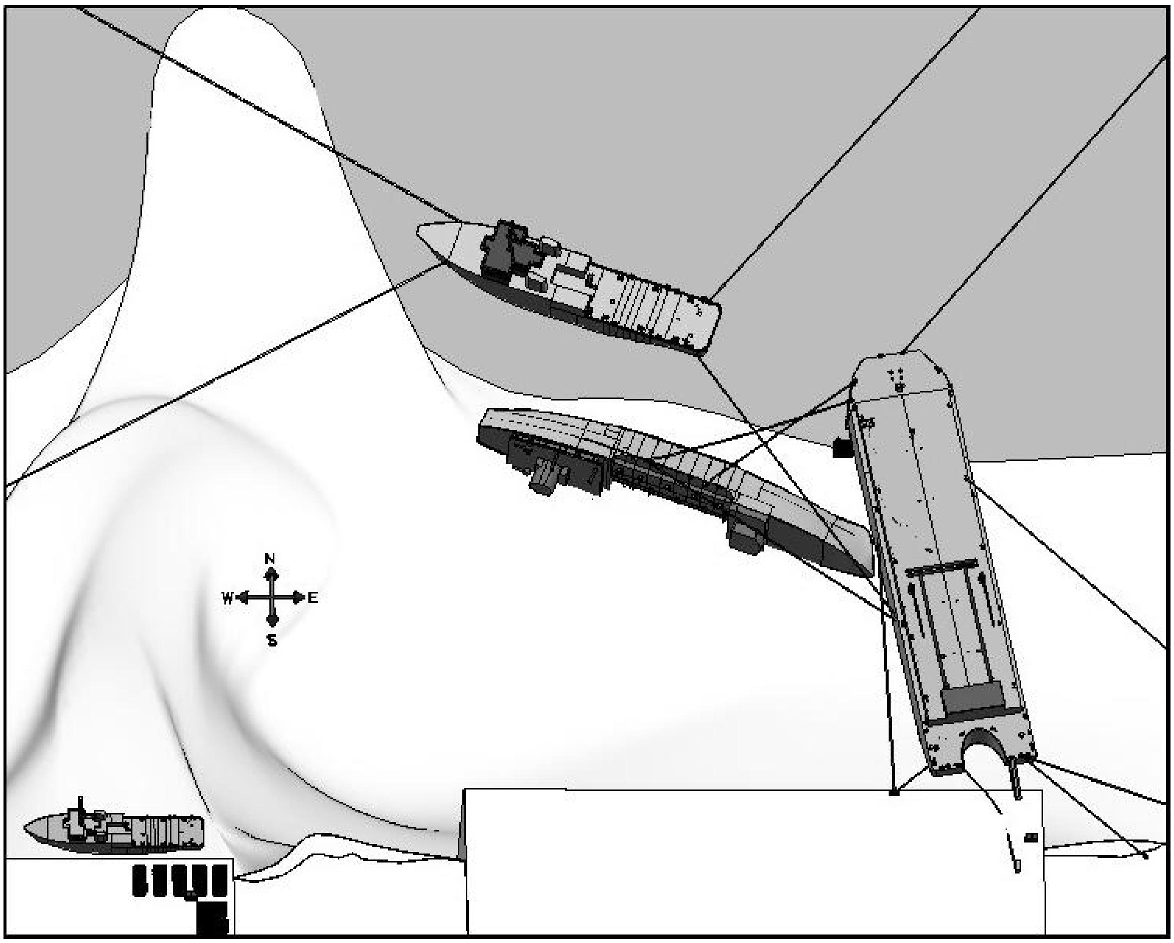
U.S. NAVY SALVAGE REPORT
EX-USS *CHEHALIS*
FUEL REMOVAL OPERATIONS



PUBLISHED BY DIRECTION OF COMMANDER, NAVAL SEA SYSTEMS COMMAND.

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Foreword

This report on the Ex-USS *Chehalis* (AGO 48) fuel removal operation documents the equipment, procedures, and teamwork used by the U.S. Coast Guard and Navy salvors to remove nearly 60,000 gallons of fuel from this submerged World War II – era Navy tanker that sunk in 1949. The whole *Chehalis* story is a fascinating one historically. This report provides glimpses of the early history, but focuses on more recent events following the first official reports of oil released by *Chehalis* into the pristine waters of Pago Pago Harbor, on the island of Tutuila, American Samoa. I'd like to highlight below a few of the elements of this offloading operation that I find particularly noteworthy for the Navy salvage community.

This successful salvage operation was a true team effort requiring collaboration from multiple agencies including the Pacific Fleet (PACFLT), U.S. Coast Guard (USCG), Naval Sea Systems Command Supervisor of Salvage (SUPSALV), Environmental Protection Agency (EPA), National Oceanic and Atmospheric Administration (NOAA), and Military Sealift Command (MSC). Mobilized to American Samoa along with the individuals from SUPSALV and our Emergency Ship Salvage Material (ESSM) / Pollution Response contractor, GPC, were Navy divers from PACFLT's Mobile Diving and Salvage Unit One (MDSU-1) and the USNS *Sioux*, as the diving support platform. GPC also subcontracted two support vessels and crews, the fuel barge TB *Capella* and ocean tug *El Lobo Grande II*. The Commanding Officer of the USCG Pacific Strike Team, CDR Mike Day, was designated the Incident Specific Federal On-Scene Commander (ISFOSC). CDR Day did an outstanding job integrating these diverse forces into an effective and efficient team.

The operations site in Pago Pago Harbor presented unique logistical challenges, requiring personnel and equipment virtually from around the world to converge on the tiny island in the middle of the South Pacific and be self-sufficient on the three support vessels for three weeks. However, what was most unique about this operation was the handling of the volatile aviation gasoline remaining aboard the Ex-USS *Chehalis*. Extensive research and training, along with special intrinsically safe equipment coupled with a comprehensive safety protocol effectively mitigated the dangers associated with removing this explosive cargo. Careful planning, equipment redundancy and salvor ingenuity were critical.

I congratulate all members of the Ex-USS *Chehalis* fuel offloading team for a job well done. I would like to especially recognize the Navy divers for their skill and professionalism, and GPC for outstanding operational planning, mobilization, and implementation, and for assembling and refining a new diver-friendly suction head and pumping system. This job represented an important step forward for the USCG and Navy in the field of submerged vessel offloading. Lest we rest too comfortably on our laurels however, I would point out that *Chehalis* could not have offered more benign operating conditions (warm, clear, relatively shallow water in a protected harbor). We must focus on the lessons detailed in this report and strive to improve our capabilities within the Navy Salvage Triad and the pollution response community.

Captain Patrick Keenan, USN
Supervisor of Salvage and Diving
Director of Ocean Engineering

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SECTION I

U.S. NAVY SALVAGE REPORT
EX-USS *CHEHALIS*
FUEL REMOVAL OPERATIONS
PAGO PAGO, AMERICAN SAMOA

January–July 2010

Prepared by:
U.S. NAVY
SUPERVISOR OF SALVAGE AND DIVING
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17 February 2011

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CHAPTER 1

1 INTRODUCTION AND BACKGROUND

1-1 Introduction

The Ex-USS *Chehalis* (AOG 48) is a World War II era Patapsco Class gasoline tanker that was scuttled in Pago Pago Harbor, American Samoa, after an explosion and fire which occurred during gasoline offloading operations in October 1949. The Ex-USS *Chehalis* burned alongside the fuel pier uncontrollably for nearly a day. Attempts to extinguish the fire were unsuccessful, and when supplies of firefighting foam were exhausted, the decision was made to release the burning ship from the pier and scuttle her in the harbor. Eventually she settled on her starboard side, facing east, in 160 feet of water approximately 300 feet from the fuel pier. At the time of her burning, records indicate that at least 350,000 gallons of petroleum products were onboard.

Over the next 60 or more years, reports of oil and fuel leaks coming from the area around the ship intensified. In 2007, a commercial survey team inspected the vessel and concluded that approximately 40,000 gallons of motor gasoline and 70,000 gallons of 115/140 aviation gasoline remained onboard the vessel. Based on the 2007 survey, American Samoa and the U.S. Environmental Protection Agency (EPA) petitioned the U.S. Coast Guard (USCG) to take action to remove the remaining fuel onboard the Ex-USS *Chehalis*.

The 2007 survey did not explore the entire vessel due to time constraints and the difficulty in accessing the cargo lube oil tanks located deep within the ship's forecastle. The 2007 survey also did not explore any of the port and starboard ship's diesel bunker tanks. In 2008, discussions ensued between the USCG Sector Honolulu, Hawaii, the National Pollution Fund Center, Region 9 USEPA, and the U.S. Navy Supervisor of Salvage and Diving (SUPSALV) regarding the risks and possible mitigation responses to the deteriorating Ex-USS *Chehalis* and the growing possibility of a catastrophic release of the remaining petroleum products. It was concluded that a more comprehensive survey needed to be conducted to examine the tankage that had not been investigated in the 2007 survey and to validate survey findings with a more in-depth analysis of the remaining products. As a result of these discussions, a combined USCG/Navy survey was conducted in April 2009 which is in Section II of this report.

The 2009 survey concluded the following:

- Lube Oil tanks A-2 and A-3 were empty.
- Cargo tanks B-8 and B-10 contained approximately 65,000 gallons of gasoline.
- Fuel Oil tanks C902 and C905 contained approximately 7,500 gallons of diesel fuel.

Samples collected in the survey from the gasoline tanks were sent to Australia for analysis. The results confirmed that the product in B-8 was a combination of high octane, high lead motor gasoline, and 115/145 aviation gasoline. B-10 was verified as containing 115/145 aviation gasoline. Both samples indicated that the remaining fuel was high quality with negligible water content. Based on the results and lessons learned during the 2009 survey, several courses of action were developed to offload and dispose of the product that remained onboard the Ex-USS *Chehalis*. Figure 1-1 is a 3-D graphic representation of the Ex-USS *Chehalis* highlighting the tanks requiring fuel offload.

After analysis and discussions, it was determined that the best course of action was to employ a military dive team from Mobile Diving and Salvage Unit One (MDSU 1), based in Hawaii, augmented with USCG and SUPSALV divers working from a Navy support vessel either a T-ARS or T-ATF class vessel.

The recovered product was to be loaded onboard a commercial Class A1 fuel barge, towed by a commercial tug which would transit to the San Francisco Bay area. The Class A1 fuel barge would then offload the recovered product into trucks and rail cars for transport to the EPA approved recycling facility, Systech, in Fredonia, Kansas, for reutilization as fuel in a cement making kiln. A more detailed account of the offload and disposal methodology selection process is contained in the Ex-USS *Chehalis* Survey Final Report found in Section II of this report.

This report covers the operational offload of the Ex-USS *Chehalis* through the reutilization of the recovered product at the Systech facility, Fredonia, Kansas.

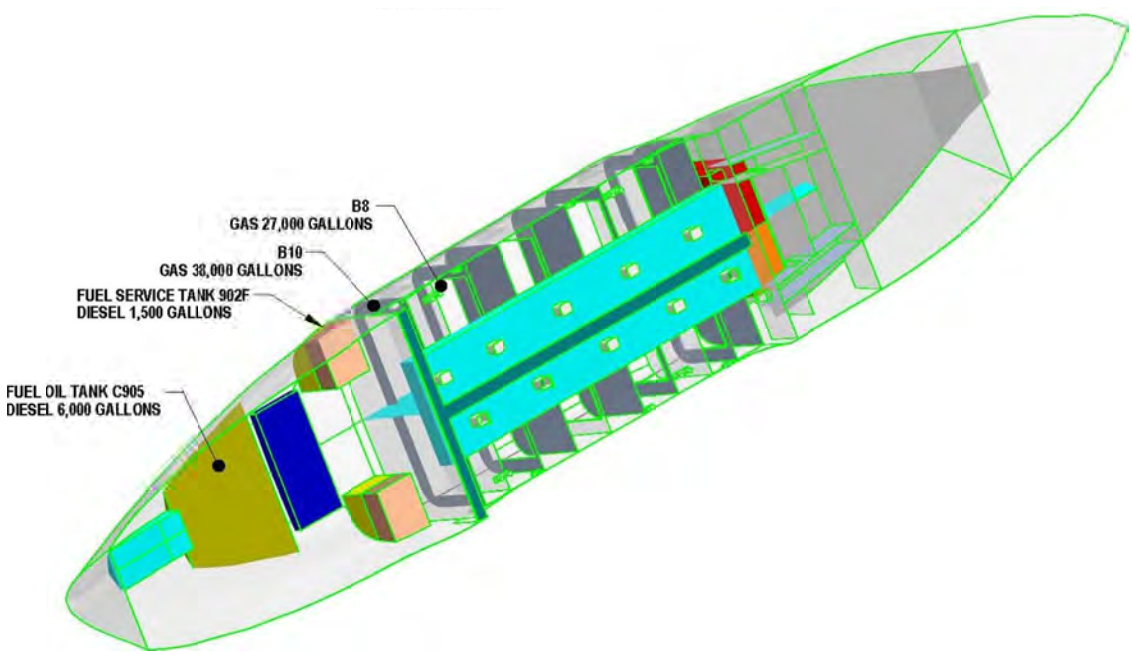

Figure 1-1. Ex-USS *Chehalis* Showing Tank Locations and Expected Fuel Volumes

1-2 Pago Pago Harbor, American Samoa Operational Area

The Ex-USS *Chehalis* wreck is located in Pago Pago Harbor, approximately 300 feet north of the American Samoa Government (ASG) fuel dock shown in Figure 1-2.

Figure 1-2. Map of Pago Pago Harbor, American Samoa Showing the Location of the Ex-USS *Chehalis* and Offload Assets

1-3 Overview of the Ex-USS *Chehalis* Survey Operation in 2009

The USCG Sector Honolulu, in conjunction with the National Pollution Fund Center (NPFC), funded the 2009 survey of the Ex-USS *Chehalis* to better determine the scope and cost of the follow-on offload operation. In preparation for the 2009 onsite survey of the Ex-USS *Chehalis*, extensive research was accomplished to develop the survey plan. Copies of the original construction drawings of the Ex-USS *Chehalis* could not be located; however, drawings for the Patapsco Class vessel the Ex-USS *Natchaug* AOG 54, built at approximately the same time, were located. Drawings for the AOG 54 and other documents were helpful in assessing the hull construction, frame structure, and piping systems of the Ex-USS *Chehalis*.

In conjunction with drawings of the AOG 54, the Report of Inquiry of the fire and sinking, the report of the USS *Current* in 1959 (which surveyed the Ex-USS *Chehalis* to determine if the ship could be salvaged), and the 2007 "Situation Report Ex-USS *Chehalis*" (prepared by Brad Rea, U.S. Public Health Service), computer models of the Ex-USS *Chehalis* were developed by GPC using the Solid Edge Modeling software. Based on the Table of Offsets from the original AOG 54 drawings, the model provided planners, engineers, and project leaders with a scaled 3-D virtual replication of the vessel that would serve as the guide for a combination USCG, Navy, and ESSM team to successfully complete the 2009 survey.

The onsite survey was conducted from 24 April to 8 May 2009 and yielded detailed information on the position, attitude, and structural condition of the wreck. The survey also provided planners with good estimates for the quantities of pumpable fuels remaining onboard the Ex-USS *Chehalis*. Fuel oil tanks, C905 and C902, were confirmed to contain diesel fuel. Cargo tank samples from B-8 and B-10 were sent to Australia and confirmed to contain high lead, high octane gasoline. The remaining tanks were verified as not containing pumpable fuels. From the survey, it was estimated that a total of 72,500 gallons of pumpable fuel would need to be removed and processed. For planning purposes, it was estimated that an additional 25,000–30,000 gallons of contaminated water would also need to be processed as a result of the offload and cleaning operations.

Information from the survey was used to develop a comprehensive Offload and Disposal Plan attached as an enclosure (refer to Section II Appendix E). The implementation of the Offload and Disposal Plan is the subject of this report.

1-4 War Graves, Ammunition, and Artifacts Considerations

All participants were made aware that six crew members were killed during the explosion and sinking of the Ex-USS *Chehalis* in 1949. While four of the bodies were recovered, two bodies remained unaccounted for. In the unlikely event that human remains were discovered, they were to be reported but not disturbed in any manner. The 2009 survey, which was supported by a small Navy EOD team, determined that ammunition was not likely to be encountered in the areas that the offload dive teams would be working, therefore it was not a hazard. Also, the dive teams were made aware that ammunition was onboard at the time of the sinking, and in the event ammunition-like objects were encountered, teams were to report, but not handle, any ordnance appearing objects. The removal of artifacts from the sunken vessel was prohibited with the policy being emphasized at regular operational meetings.

1-5 2010 Offload and Disposal Tasking and Missions

Based on the results of the 2009 survey, the USCG Sector Honolulu tasked SUPSALV to assist in executing the Offload and Disposal Plan jointly developed as an integral part of the survey tasking. Funding for executing the Offload and Disposal Plan was received in January 2010, and the procurement of services and equipment commenced immediately. Separately, the USCG Sector Honolulu tasked Commander Fifth Fleet for the services of MDSU 1 and a supporting salvage ship or fleet tug to serve as the dive platform via a Request for Forces (RFF).

Prior to the onsite execution phase of the Offload and Disposal operation, bi-weekly telephonic coordination meetings were conducted and facilitated by USCG Sector Honolulu's, LCDR Joe Herrador. Attendees at the telephonic coordination meetings included the following: USCG District 14, USCG Pacific Strike Team, USCG Marine Safety Office, American Samoa, USCG Civil Engineering Unit, Honolulu, SUPSALV, GPC, MDSU 1, National Oceanic and Atmospheric Administration (NOAA), National Pollution Fund Center, and the Environmental Protection Agency (EPA). The coordination meetings were essential to ensure that all teams, logistics, and operational details were fully synchronized.

The Commander, Pacific Strike Team, CDR Mike Day was designated the Incident Specific Federal On-Scene Commander (ISFOSC) for the operation. CDR Day, and elements of the Pacific Strike Team, were tasked with overall operational command as well as overseeing the safety aspects of the operation including air monitoring.

The SUPSALV project manager, Kemp Skudin, tasked GPC, the ESSM contractor, with finalizing the details of and implementation of the Offload and Disposal Plan. This included the assembly of the offloading systems using ESSM equipment and specially developed tools. It also included sourcing and procuring the appropriate commercial support vessels, and the provision of an operations team to perform the offloading operation and assist the ISFOSC, MDSU 1, and the SUPSALV representative with technical advice and support during the operation.

1-6 Overview of 2010 Operations

Authorization and funding was received in early January 2010 to proceed with the offload of the estimated 72,500 gallons of fuel from the Ex-USS *Chehalis* in late March, early April. This timeline, while ambitious, coincided with favorable weather windows, fuel pier availability, and availability of dive personnel and support vessels.

Three support vessels were tasked for the operation, the USNS *Sioux*, the TB *Capella*, and the tug *El Lobo Grande II*. All of these vessels were home ported on the West Coast necessitating early outfitting and movement in order to meet the operational timeline.

The USNS *Sioux*, a Navy asset, served as the dive platform for the operation as she has done on other missions. Her unencumbered aft deck, twin bow anchors, and diver certified crane ideally suited her for the operational tasking. The TB *Capella*, an unrestricted service Class A1 Tank Barge, fully certified by the USCG to carry fuels, including the highly volatile gasoline, received the fuels from the Ex-USS *Chehalis* and transported them back to the West Coast. The TB *Capella* was manned with USCG certified tankermen to assist in the safe transfer of the recovered product. The oceangoing tug *El Lobo Grande II* provided propulsion for the TB *Capella*.

MDSU 1 Company 1–8 from Hawaii augmented with USCG and NAVSEA divers, provided the divers and all of the dive support equipment, including the recompression chamber for the operation. Their equipment was shipped in three ISO containers via commercial vessels.

The SUPSALV ESSM contractor, GPC, designed, fabricated, tested, and assembled the required special diver tools, suction head, pumps, and support equipment. This equipment shipped in three additional containers.

During the week of 22 March, equipment and personnel converged in Pago Pago Harbor to commence operations. The first operational day was 26 March, and the 50 personnel plus a contingent of divers and support personnel went to work to safely offload the remaining fuel and associated slops from the Ex-USS *Chehalis* over the next 12 days. In accomplishing the offload, two hot tap operations defueled diesel fuel tanks C905 and C902F, and the special suction head defueled some 53,205 gallons of high lead/high octane gasoline from cargo holds B-8 and B-10. A total of 39 surface supplied dives and 33 SCUBA dives were safely conducted in during the offload operation.

From Pago Pago, the TB *Capella*/*El Lobo Grande* combination returned to the West Coast and offloaded the recovered fuels and slops to waiting trucks and rail cars in the port of Richmond, California. From there, the 54,505 gallons of fuel was transported to Systech Environmental Corporation in Fredonia, Kansas, for recycling in their cement-making kiln. The residual 9,000 gallons of slops and tank cleaning residues were processed at DeMenno Kerdoon, an EPA certified recycling facility in Compton, California.

This concluded the safe and successful offload and disposal operation of the Ex-USS *Chehalis*. As a result of the combined efforts of the multi-agency task force, the operation was conducted without incident and the remains of the Ex-USS *Chehalis* no longer pose a catastrophic environmental risk.

1-6.1 Operational Factors

Diving, cargo handling, and vessel operations always pose a calculated degree of risk. However, the low flash point and corresponding high volatility of the 115/145 aviation gasoline aboard the Ex-USS *Chehalis* were the prime operational risk considerations in conducting the offload of the ship. Extensive research, planning, and special intrinsically safe equipment, coupled with a comprehensive safety protocol, effectively mitigated the dangers associated with this highly explosive cargo.The wind, sea, and weather conditions in Pago Pago Harbor were for the most part benign, enabling vessel, mooring, and diving operations to proceed as planned.

The logistics support line of communications had a long tail, being some 5,200 miles from the mainland with only twice a week aircraft arrivals; however it was executed with near precision due to the planning and the self-sufficiency imbedded in the organizational structure and equipment redundancy.

1-6.2 Mission Purpose

The purpose of the offloading operation was to safely remove and dispose of an estimated 72,500 gallons of diesel and high octane gasoline from the Ex-USS *Chehalis* in 160 feet of water in Pago Pago Harbor, American Samoa. The offload was executed with the purpose of eliminating the risk of a catastrophic release of the remaining fuels due to the deteriorating condition of the ship which had sunk in 1949. Decisions early in the planning process concluded that removal of 98% of the cargo would eliminate the possibility of a catastrophic release in the future without incurring the significant additional costs associated with a 99% plus removal operation.

Project goals were as follow:

1. Safely remove 98% of the remaining pumpable fuel aboard the Ex-USS *Chehalis*.
2. Recycle, where possible, the recovered products in an environmentally safe manner.
3. Dispose of recovered slops and tank wash residue in an environmentally safe facility.
4. Conduct operations so as to minimize the possibility of spills and environmental damage during the conduct of offload operations.
5. Secure penetrations made in the Ex-USS *Chehalis* to minimize the possibility of future leakage.

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CHAPTER 2

2 COMMAND AND ORGANIZATON

2-1 Organizations Involved

Although numerous agencies of the U.S. and American Samoan governments were involved to varying degrees, the critical operational (tactical) organizational structure is depicted below in Figure 2-1.

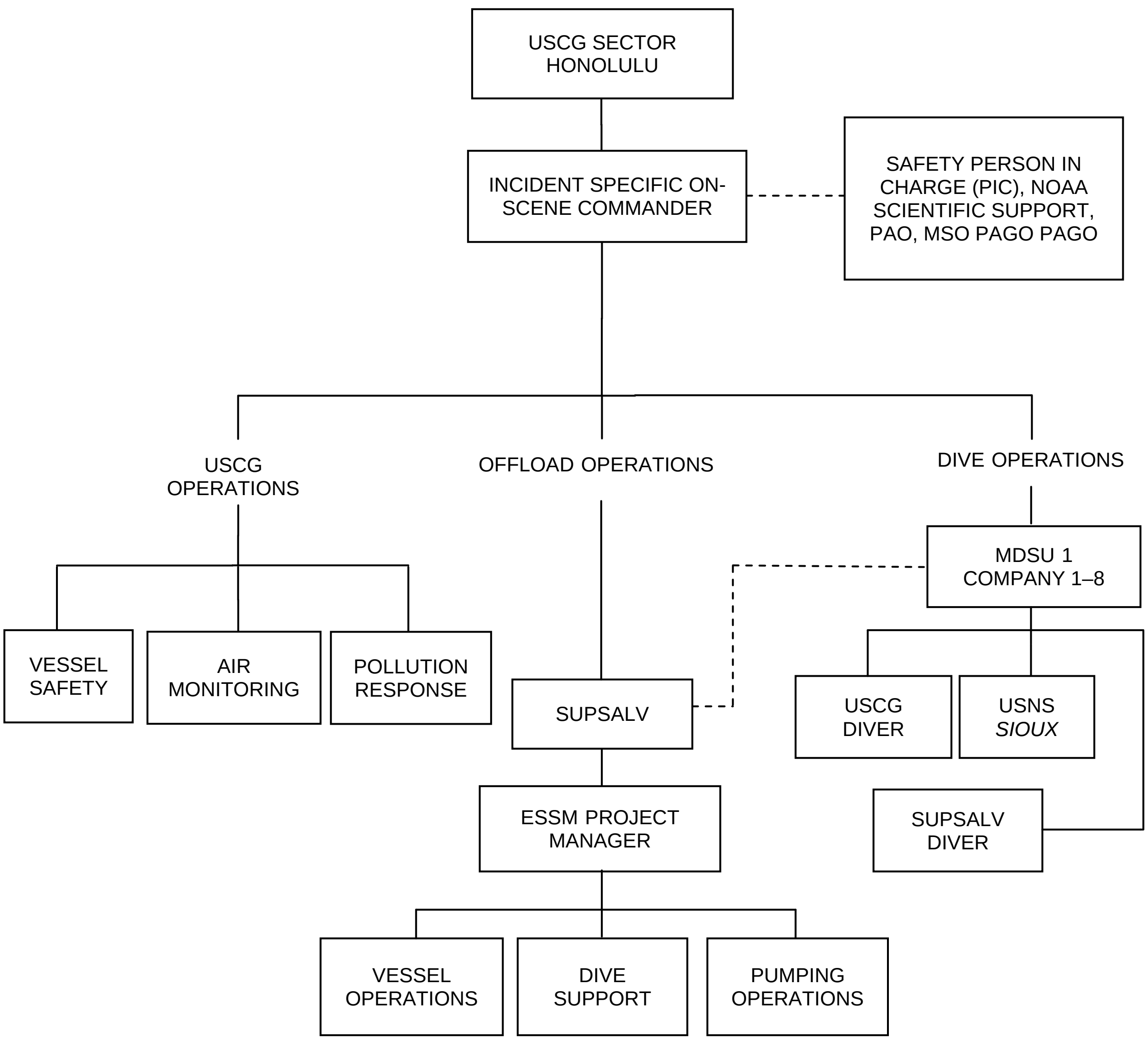

Figure 2-1. Ex-USS *Chehalis* Operational Organization Chart

Incident Specific Federal On-Scene Commander (ISFOSC). Commanding Officer, Pacific Strike Team, CDR Mike Day, USCG, was designated OSC, reporting to the Captain Barry Compagnoni, Commander, USCG Sector Honolulu the Federal On-Scene Commander.

SUPSALV Representative. The SUPSALV Representative, Kemp Skudin, the SUPSALV On-Scene Salvage Supervisor, coordinated the NAVSEA technical and financial aspects of the project and all SUPSALV contractor activities for the ISFOSC.

GPC Project Manager. The GPC Contractor Project Manager, Ron Worthington, managed contractor operations and sub-contracted support vessels. Ron Worthington and Kemp Skudin performed the bulk of the detailed oil removal planning and technical direction of the actual operation before and during the operation.

Hot Tap/Pumping Supervisor. GPC's Craig Moffatt and Roy Ludi were responsible for engineering, planning, development, and execution of the hot tap, pumping, and offload operations.

Dive Operational Support. GPC's Paul Schadow provided guidance and onsite assistance to the MDSU 1 dive team effectively integrating the ESSM tools and equipment into dive operations.

Barge/Support Vessel Supervisor. Daron Marsh, skipper of the tug *El Lobo Grande II* and TB *Capella*, was responsible for all matters relating to the vessels contracted for the operation, including installation of the moor. He reported to the GPC Project Manager.

USCG Certified Person In Charge (PIC). Wayne Warfield, SEACOR International (under contract to GPC), provided independent technical oversight of the pumping and fuel handling operations to the ISFOSC.

USCG Operations. CWO Louis Munoz, USCG, Pacific Strike Team, coordinated the overall Safety Program for the offload operation, including air monitoring. CWO Munoz was also in charge of the Pollution Response operations should they be needed. CWO Munoz reported to the ISFOSC, CDR Day.

Dive Operations. CWO2 Randy Duncan and MDV Jon Klukas, USN MDSU 1, supervised the dive operations for the entire offload operation; they spearheaded an effective pre-operation training program which resulted in a timely and efficient offload.

USNS *Sioux*. Captain Bradley Smith MSC skippered the USNS *Sioux* during the entire voyage from the West Coast during onsite operations and for the return voyage. During mooring operations, he was technically advised by Rick Bettua, a GPC contractor with technical expertise in both salvage and dive operations.

2-2 Personnel

During the operation's peak, the following was the personnel breakdown of operational forces.

USCG	9
SUPSALV Representatives	2
MDSU-1	20
NOAA	1
GPC	10
PIC	1
TB *Capella*/*El Lobo Grande*	6
USNS *Sioux*	1 + crew
TOTAL	50

The following is a list of offload operational personnel:

USCG Personnel
- CDR Michael Day
- LCDR Joe Herrador
- LT Tedd Hare
- LT Dan Lee
- LT Stacey Creacy
- CWO Luis Munoz
- MK1 Justin Gerg
- EM1 Brian Atkiston
- DC2 Karl Seigmund

SUPSALV Personnel
- CAPT Patrick Keenan
- Kemp Skudin

NOAA Personnel
- Ruth Yender

MDSU 1 CO 1–8 Personnel
- CWO Randy Duncan
- MDV Jon Klukas
- NDCS Craig Simon
- NDC Jacob Eskew
- ND1 Jericho Diego
- ND1 Mariano Lorde
- ND1 Alexander Grun
- HMCS Dan Ritch
- ND2 Richard Ellis

MDSU 1 CO 1–8 Personnel (Cont'd)
- ND2 Jeremy Odell
- ND2 Brody Dorton
- ND2 Jason Balavram
- ND3 Josh Westman
- ND3 Jordan Wingard
- ND2 James Maxey
- NDC Paul Wotus
- BM1 Richard Racette
- ND1 Emilio Soria

Attached Personnel
- USCG Diver Paul Smith
- SUPSALV Diver Stephanie Brown

ESSM Personnel
- Ron Worthington
- Craig Moffat
- Paul Schadow
- Roy Ludi
- Rick Bettua
- Joe Stewart
- Scott Caple
- Jared Diego
- Billy Eubanks
- Dwight Adams

USNS *Sioux* Personnel

CAPT Bradley Smith

TB *Capella*/*El Lobo Grande* Personnel

CAPT Daron Marsh
David Spigolon
Victor Biegel
Jeffery Barstad
James Johnson
Fernando Fernandez De Liencres

SEACOR PIC

Wayne Warfield

CHAPTER 3

3 PLANNING , PREPARATIONS, AND MANAGEMENT

3-1 Planning

Concept of Operations

The Ex-USS *Chehalis'* offloading concept of operations involved the use of Navy and U.S. Coast Guard divers to hot tap into two fuel oil tanks containing diesel fuel and suction off the two cargo tanks containing gasoline with a newly designed suction head. The suction head was designed to float to the top of the tank when supplied with air from the dive support vessel. The USNS *Sioux* would function as the dive support vessel, and the Class A1 certified barge/tug combination *Capella*/*El Lobo Grande II* would receive the recovered products and transport them back to the West Coast. The product was transferred to rail cars and trucks, and then delivered to an approved EPA reutilization facility located in Kansas.

3-2 Vessel Selection

Three primary support vessels were selected to perform the offload of the Ex-USS *Chehalis* project – TB *Capella*, Class A1 fuel barge (see Figures 3-1 and 3-2) and *El Lobo Grande II*, ocean tug (see Figures 3-3 and 3-4), and the USNS *Sioux* (see Figures 3-5 and 3-6). Operational vessel suitability for the tasking was the prime selection criteria followed by cost and availability considerations.

Figure 3-1. TB *Capella*

CAPELLA

Capacity:	81,751Barrels @ 98%
Service:	Unrestricted Service
Classification:	**✠A1**, Oil Tank Barge
Cargo:	Grage A and below, & NLS
Official Number:	1129491
Built:	Halter Marine Gulfport, MS 2002
Hailing Port:	Portland, OR
Gross Tonnage:	5,790 ITC
Net tonnage:	3,846 ITC
Deadweight Tonnage:	11,964 LT
Full Load Displacement:	13,824 LT SW

OPA-90 Compliant, U.S. Flag, Jones Act Qualified

Mooring equipment:

Bow:	Hydraulic Anchor Windlass 5,000 lb Anchor 720' 1 1/4" wire 2 - Gypsy Heads
Stern:	2 Hydraulic vertical capstains

Pollution Prevention:

- 1000' 20" harbor containment boom
- Skimming and emergency lightering system
- 16' Response skiff
- Bergen Tank Radar gauging system
- Bergen high level overfill alarm system
- MMC closed tape gauging system

Dimensions:

Length:	332'
Beam:	74'
Depth:	25'
Loadline draft:	22' 1"
Loadline freeboard:	3' 11"
Light draft:	4' 6"
Tons per inch:	57.58
Freshwater allowance:	6 3/16"

Cargo System:

Cargo Tanks:	10
Systems:	2
Pumps:	2- Byron Jackson LS-12
Prime Movers:	2- CAT 3406C
Rate:	4,500 bph each

Other Data:

Tank coating:	National NC-600
Heating system:	None
Double sides:	Yes
Double bottom:	Yes
Hose cranes:	2
Manufacturer:	Elevating Boats Inc
Type:	40' fixed boom
Safe working load:	4,000 lb capacity
Vapor recovery:	Yes
Closed gauging:	Yes
Generator:	John Deere
Output:	40 KW
Fuel tank Capacity:	16,000 gal
Stern to center manifold:	157'
Bow to center manifold:	175'
Manifold to side shell:	15'
Stripping system:	2" cargo stripping system
Manifold Connections:	2 each side
Manifold connection size:	12"
Vapor Connection:	10"

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SEATTLE, WASHINGTON 98199
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PACOPS@K-SEA.COM

W:\VESSELS\BARGES\CAPELLA\DATA

APRIL 2008

Figure 3-2. TB *Capella* Specification Sheet

Figure 3-3. Tug *El Lobo Grande II*

El Lobo Grande II

IMO Number:	7802641
Official Number:	596941
Class:	ABS A-1 AMS Towing Serv. Cert #7808358
Hailing Port:	Wilmington, DE
Call Sign:	WDA 9486
MMSI Number:	369181000
Builder:	McDermott Shipyards, Inc
Place Built:	Amelia, LA 1978 Hull No. 239
Year Built:	1978
Gross Tonnage:	199 (563 ITC)
Net Tonnage:	135 (168 ITC)
Dimensions:	
Length:	128' 6"
Beam:	36' 6"
Depth:	19'
Loadline Draft:	16' 1 3/4"
Air Draft @ LL:	50'
Height of Eye:	36'
Freshwater Allowance:	na
Single/Twin Screw:	Twin
Propellors:	5 Blade
Kort Nozzles:	none
Main Engines:	(2) EMD 16-645-E7
Horsepower:	5,750 (2 X 2,875 ea)
Reduction Gears:	Falk 3040MRVFC-E
Anchor Equipment:	
Manufacturer:	unknown
Chain size:	2"
Chain length:	9 shots

Generators:	(2) GM 6V-71
Output:	90kW
Tow winch:	
Single/Double Drum:	Double
Manufacturer:	Markey TDSDW-36-C-32
Engine:	GM 6-71
Tow Wire:	
Port Drum:	2 1/4" X 2,500
Starboard Drum:	2 1/4" X 2,500
Bollard Pull:	151,250 lbs
Fuel Capacity:	140,000 gals @ 98%
Lube Oil Capacity:	2,000 gals
Hydraulic Oil Capacity:	1351 gals
Potable Water Capacity:	10,000 gals
Ballast Capacity:	60,000 gals
Slop Tank:	2,000 gals
Maximum Crew Capacity:	9
Other Data:	"Orville Hook" barge retrieval system Radar: (1) Furuno FR1510 MKII (1) Furuno FR 8100D GPS: (1) Furuno GP-37 WAAS/DGPS (1) Trimble GPS VHF: (1) ICOM MC-M80 (1) SEA 156, (1) RAY-33 SSB: (1) SEA-330, (1) ICOM IC-M710 Autopilot: Sperry Cell Phone Satellite Comms: phone/e-mail Gyrocompass: Sperry MK 37 WeatherFax: Furuno DFAX Fathometer: (1) Ross (1) Furuno LS-6000

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Rev. January 2006

Figure 3-4. Tug *El Lobo Grande II* Specification Sheet

Figure 3-5. USNS *Sioux*

NAVSEA
NAVAL SEA SYSTEMS COMMAND

T-ATF 166 POWHATAN CLASS

Design Features and Capabilities

(weight data is for T-ATF 172 Apache)

PEO SHIPS

DIMENSIONS

Length, Overall:	68.9m
Length, LBP	59.4m
Beam, Waterline:	12.8m
Draft, Full Load, midships:	4.57m

PERFORMANCE

Sustained Speed:	14.5knots
Installed Power:	11,460 kW
Range (@13 kts)	10,000 miles

ACCOMMODATIONS

MSC Accommodation Standards

Civilian	(16)
Navy	(4)
Stowable Accommodations	(20)
Total Crew	(20)
Total Accommodations	(40)

PROVISIONS (cubic m)

Freeze	2.07
Chill	4.41
Dry	5.94

AVIATION FACILITIES

Level III (day visual flight only)

Class 4 (VERTREP helo types H1, H3, H46, and H60)

Class 5 (high hover VERTREP) for helo types H53D and H53E)

NAVIGATION

2 x Navigational radar
1 x GPS receiver
1 x AN/WRN-6(V), military GPS
1 x Mk 37 gyrocompass
1 x Automated Identification System
1 x Ship Security Automated System

MACHINERY SYSTEMS

2 x GM EMD 20-645F7B diesels; 5.73MW each
2 x Kort nozzle, controllable-pitch propellers
3 x 400 kW diesel generators
Bow thruster; 224 kW

AUXILIARY SYSTEMS

Submarine Rescue System – Rescue Capable System (SRS-RCS)
1 x 7.3m Aluminum workboat
1 x 4.3m inflatable boat
Lifeboats and Liferafts in accordance with USCG regulations
1 x Towing Winch (192 mton)
1 x Towing Winch (91 mton)
Multipurpose crane (10 ton)
3 x fire monitors
Sub Rescue Diving/Recompression (SRDRS) space and weight reservation
Mark I Mod I Deep Diving System space and weight reservation
Transfer Under Pressure
Assessment/Underwater Work System space and weight reservation
Submarine Rescue Chamber Fly-away System weight and space reservation
Receive Fuel at Sea Stations (P/S)

WEAPONS

Space and weight reserved for machine guns and similar light weapons

C4I

1 x Naval Modular Automated Communication System
1 x AN/URQ-23 frequency standard or equal
1 x Manual Single Audio System

RADAR FACILITIES

1 x ECDIS
2 x SAT-2 infrared transponder
1 x AN/APX-72 IFF transponder

SONAR

1 x 600 Fathom fathometer
1 x AN/WQC-2 underwater comm set (or equivalent)

BOLLARD PULL

70 mton

WEIGHTS (metric tons) estimated

SWBS 100	784
SWBS 200	179
SWBS 300	29
SWBS 400	5
SWBS 500	313
SWBS 600	100
SWBS 700	0
Lightship (delivered)	1410
Lightship (mid-life)	1566
Deadweight	748
Full Load Disp. (mid-life)	2314

STABILITY

46 CFR Subchapter S
One compartment subdivision

REQUIREMENTS

ABS Steel Vessel Rules (< 90m) Class
United States Coast Guard Certification
Federal Communications Commission
U.S. Public Health Service
Class C ice strengthened

Current as of August 2010

Figure 3-6. USNS *Sioux* Specification Sheet

3-3 Environmental Issues Considered

The USCG conducted a comprehensive Environmental Assessment (EA) prior to authorizing the offload to begin. The potential impact of the proposed operation, including an incidental release of fuel during the process of cargo removal, was scrutinized from the perspective of the possible environmental consequences to the following resource categories:

- Water
- Biological
- Land
- Cultural/historical maritime
- Socioeconomic
- Waste management
- Human health and safety

The National Oceanic and Atmospheric Administration (NOAA) performed an intensive analysis of potential spill trajectories and evaporation times for the highly volatile products based on historical wind and weather data. NOAA concluded that during the scheduled offload window, the fuel would evaporate within two hours, if all of the projected cargo were released at once.

The EA concluded the following:

- The Ex-USS *Chehalis*' Operational Plan was designed to minimize environmental impacts in general and fuel spill risks in particular.
- With the safety shutdown of the pumping systems designed into the operation, the potential oil spill volumes would be small should a pump or hose fail.
- Onsite containment and recovery equipment was sufficient to cover a potential spill. In addition, BP and the Clean Island Council conducted an in-water spill response exercise during the offload operational window, and the USCG scheduled the maintenance on their DRAT equipment on the island to coincide with the offload schedule.
- Local commercial response resources available through SOLAR Inc. SOLAR Inc was on alert to provide additional response personnel and equipment if needed.

The EA concluded with a finding of no significant impact thereby paving the way for conducting the offload operation.

3-4 Preparations

With funding in place to support the mission, the development and assembly of special tools and equipment began in early January 2010. The support vessels procured were the ocean tug *El Lobo Grande II* and the Class A1 fuel barge TB *Capella*. Both vessels were placed on retainer for a scheduled departure date of 1 March 2010 with an anticipated arrival in American Samoa of 26 March coinciding with the planned start of operations. Procurements of special equipment and large bulky equipment had to be completed with enough time to meet the ocean cargo shipments scheduled for Samoa. This included the special internally bonded 2″ gasoline discharge hoses with crimped-end fittings, intrinsically safe pneumatic pumps, and the GPC designed and fabricated suction heads and metering manifolds. These actions were expedited as the Ex-USS *Chehalis*' support equipment shipments, via ocean carriage, needed to leave Hawaii and the East Coast by the middle of February to ensure arrival in mid-March at Pago Pago Harbor.

The first suction head was completed in early January and tested in the tank at Cheatham Annex. Based on this test, modifications were made to improve the efficiency, durability, and practicality of the device. The suction head, along with 150 feet of hose and a pneumatic pump, was shipped to Hawaii for a test, training, and evaluation exercise during the week of 18 January 2010. The training evolution was structured to validate the new equipment as well as to familiarize MDSU Company 1–8 personnel on the equipment, procedures, and safety standards for the forthcoming operation.

GPC conducted hot tap and suction head training for the Navy and USCG divers in Hawaii for 4 days late in January 2010. Instruction and hands-on training of divers, who would later perform the actual tasks on the wreck, prepared both divers and topside personnel for executing the mission. With the aid of computer generated graphics from Solid Edge Modeling software, divers were able to perform a virtual tank entry and hot tap operation. Additional time was taken to experiment with the new suction head and its operation. As a result of diver input, changes were made to subsequent units to improve and simplify operations. Trial runs with the new device were accomplished under a barge located at the pier in approximately 20 feet of water. The grid system, used as the navigational aid to locate the hot tap points on the hull, was revised based on diver input from this training. Shoreside, the divers used a mock-up hull plate to practice hot tapping procedures. Approximately 15 MDSU 1 and USCG divers trained during that week, all of whom were assigned to the upcoming Ex-USS *Chehalis'* operational mission. The training confirmed the viability of the systems, and only minor modifications were incorporated into the second suction head that was built.

During the training exercise, it was specifically noted that CWO Randy Duncan and MDV Jon Klukas did an excellent job of preparing their dive team for the upcoming operation. MDSU Company 1–8 was knowledgeable of the history of the Ex-USS *Chehalis,* the configuration of the structural aspects of the ship, and the dangers associated with the highly volatile gasoline that was to be offloaded. These operational and safety risks were further emphasized during all training.

Following the training exercise, both ESSM and MDSU 1 personnel concentrated on the final assembly of equipment and packing the six 20′ ISO shipping containers. In the interim period, the floating pump platform, mooring lines, and other outsized support equipment was shipped from Cheatham Annex to San Francisco for loading aboard the TB *Capella*. One ESSM container from Cheatham Annex with all of the hose fittings and special equipment departed on 19 February. Three containers from Hawaii with MDSU and ESSM equipment departed on 17 February. The TB *Capella* and a tug departed San Francisco 1 March headed to Hawaii where they would refuel and change tugs. The ESSM Shop and Rigging Vans departing from Port Hueneme, California, were also picked up on 1 March. In late January, the USCG Buoy Tender *Walnut* provided a lift of opportunity for ESSM equipment from Hawaii transporting a rigid hull inflatable boat, a spare air compressor, and two mooring systems. By 2 March, all of the containerized equipment was consolidated in the port of Long Beach, California, and departed on 7 March with a scheduled arrival in Pago Pago the week of 22 March aboard the Polynesia Lines vessel *Niu Polynesia*. The USNS *Sioux* (T-ATF) arrived in Hawaii from the West Coast the week of 15 March to fuel and pick up the remainder of the MDSU 1 out-sized equipment (3500 lb anchor, chain, and jewelry). With the first wave of operational personnel from the supporting agencies scheduled to arrive in American Samoa on 25 March, it was imperative that the support equipment, vessels, and local material handling equipment (MHE) support arrive on or ahead of schedule. LT Dan Lee, USCG Engineer Support Unit Hawaii, was appointed Liaison Officer and deployed to American Samoa on 21 March. LT Lee is a native Samoan and speaks Samoan. His early arrival and ability to communicate with the local population facilitated a timely and fluid integration of local support throughout the entire operation.

3-5 Sanitary Wastewater

The majority of operational forces billeted ashore. The hotel and facilities located on the container and fuel pier were within easy walking distance from the operational site. The *El Lobo Grande II* berthed pierside with pump out facilities nearby. The USNS *Sioux*, with the MDSU 1 contingent aboard, could store only 8–12 hours’ accumulation of sanitary wastewater before needing to pump. A new Marine Sanitation Device (MSD) was installed prior to her departure from the West Coast to enable the processing of waste while remaining in the moor supporting the operation. This device failed on the first operational day causing the USNS *Sioux* to return pierside for pumping. Attempts to repair the MSD failed when the required circuit board and a technician could not be found locally.

A workaround was negotiated via the local tuna cannery which had a waste disposal vessel that transited to an EPA approved offshore waste site daily. Provisions were made for the waste vessel to come alongside the USNS *Sioux* and pump off her waste and dispose of it in the EPA approved offshore dumping ground. This allowed the USNS *Sioux* to remain on station for the remainder of the operation.

3-6 Solid Waste

Solid waste aboard the TB *Capella* was kept to a minimum and hand carried daily to a shoreside dumpster. Solid waste, from the *El Lobo Grande II* and the USNS *Sioux*, was handled by the respective vessel agents with scheduled pickups.

3-7 Waste from Recovered Products

Approximately 5 gallons of residual liquid and saturated sorbents from the sampling station were turned over to the American Samoa Government (ASG) Fire Department at the conclusion of operations for use/disposal in their scheduled fire training exercises.

3-8 Management

3-8.1 Daily Routines

The daily operational routine was sequenced as follows:

- Key Personnel Morning Operation's Meeting
- All Hands Safety Briefing and Operation's Briefing
- Daily Operations
- Operational Meetings with select entities as dictated by changing operational conditions
- Key Personnel Evening Planning Meeting
- SITREP Preparation
- SITREP Distribution

3-8.2 Communications Plan

The following Communications Plan was in place for the duration of the Ex-USS *Chehalis* project.

- **Liaison with the American Samoan government:**

  Commander USCG Sector Honolulu was responsible for coordination with American Samoa authorities in preparation for the offload as well as during the operation itself. LT Teddy Harre, from the USCG Marine Safety Detachment American Samoa, was the point man for most of the pre-operational coordination and was augmented by LT Dan Lee, ESU Honolulu. LT Lee is a native Samoan and his knowledge of the customs, culture, and language greatly facilitated the logistical operational support.

- **Situation Reports (SITREPs):**

  The ISFOSC was responsible for compiling and distributing a daily situation report. Information was gathered by the USCG operations section and provided to Sector Honolulu for official distribution. The SUPSALV On-Scene Representative reported on the planned and completed actions of NAVSEA contractors and provided an overall status of operations through the ISFOSC's daily SITREP.

- **Reporting Significant Spills:**

  While it was the responsibility of the ISFOSC to report spills or discharges resulting from the operation, no fuel was released during the offload of the Ex-USS *Chehalis*.

Communications:

Only intrinsically safe electronic equipment was allowed on the fuel pier and the TB *Capella*. Non-intrinsically safe radios, cameras, cell phones, computers, and other electronic equipment were required to be shut off when entering the fuel pier and while on the barge.

Cell Phone: Cell phone service was readily available with locally procured instruments. The USCG provided phones to essential personnel for the operation, and "minutes" were procured as required. Cell phones were not intrinsically safe and therefore not permitted on the pier or fuel barge.

Email: Email was available using the Wi-Fi facilities at the hotel and in the port. A dedicated T-1 line was also installed in the MSD office in Pago Pago for Navy Marine Corps Intranet (NMCI) computers requiring a hard line capability.

Radio: All operational elements provided VHF communications via base stations, hand-held radios, or small-boat-mounted radios. ESSM provided intrinsically safe radios for all tank barge and fuel handling operations.

- Primary working frequency: Channel 81
- Secondary working frequency: Channel 83
- Contact list and call signs for key personnel

- **Public/Media Affairs:**

These activities, including VIP site visits, press inquiries/releases, and related issues were coordinated by the ISFOSC.

The USCG provided an intrinsically safe camera to document operations in the restricted zones around the fuel pier and the TB *Capella*.

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CHAPTER 4

4 LOGISTICS

4-1 Equipment Mobilization Logistics

Support equipment mobilization took place from three primary locations: ESSM Base, Cheatham Annex, Williamsburg, VA, ESSM Base, Port Hueneme, California, the Mobile and Diving Salvage Unit One and ESSM Base Hawaii, both located in Honolulu, HI (see Figure 4-1). All six ISO 20′ container shipments, including the three containers from Hawaii, were consolidated in the port of Long Beach, California, for the transit to American Samoa. This consolidation was necessary because Polynesia Lines (the only shipping line with regularly scheduled service to American Samoa from U.S. ports) did not have a direct sailing from Hawaii to American Samoa. In addition to the six container shipments, the USCG Buoy Tender *Walnut* provided a lift of opportunity in late January for two mooring systems, an air compressor, and a Rigid Hull Inflatable Boat (RHIB) from Hawaii to Pago Pago. With the exception of the equipment that arrived on the USCG *Walnut*, all of the containers arrived in Pago Pago just prior to the arrival of the operational forces.

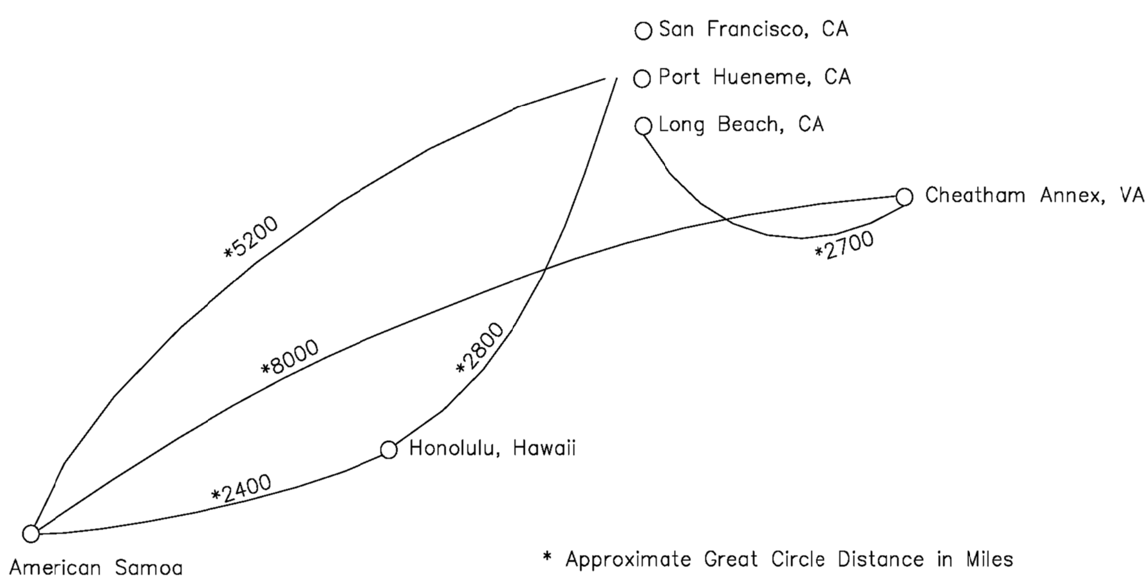

Figure 4-1. Mobilization Distances in Relation to Pago Pago Harbor

4-2 Personnel Mobilization Logistics

Operational personnel from the West Coast, East Coast, and Hawaii (other than vessel crews) traveled to American Samoa on commercial airlines through Honolulu, HI. Travel schedules and the start of operations were coordinated carefully due to the fact that flights into and out of American Samoa from Hawaii are only available on Thursdays and Sundays. The limited flight schedules also necessitated detailed planning with respect to parts and backup support should unanticipated equipment failures require that replacements be air freighted from the mainland or Hawaii into American Samoa.

On American Samoa, rental cars and vans provided the necessary on island transportation. The majority of operational personnel were billeted at Sadies Hotel which was a 5 minute walk to the primary operational sites, the ASG container and fuel piers.

A variety of small ESSM inflatable boats provided transport from the pier to the USNS *Sioux* and the TB *Capella* as required. The boats also served as backup medical evacuation assets in case of an emergency on the barge or the USNS *Sioux*.

4-3 Vessel Mobilization Logistics

4-3.1 TB *Capella/El Lobo Grande II*

The charter for the TB *Capella* originated and terminated in San Francisco Bay, California. On both the outbound and return trip to and from American Samoa, the barge/tug combination stopped in Honolulu, HI, to refuel during the 9,200 nautical mile round trip. The barge/tug combination departed San Francisco on 1 March in order to arrive in Pago Pago Harbor on 26 March coinciding with the arrival of the operational advance party on 25 March and the start of set up operations on Friday, 26 March.

4-3.2 USNS *Sioux*

The USNS *Sioux* departed San Diego on 8 March arriving in Honolulu, Hawaii, on 15 March to load a stern anchor assembly and to take on fuel. She departed Honolulu on 20 March and arrived in Pago Pago Harbor on 26 March, coinciding with the start of operational preparations.

4-4 Local Logistical Support

Mobile Crane Services were contracted for with Fletcher Construction Services who provided a 40-ton mobile crane to support loading and offloading operations on the ASG container pier.

Forklift services were provided by Harbor Maritime and Stevedore Company on an hourly contract basis.

4-5 Resupply

Based on the challenges encountered with local support during the survey operations, the offload operation was structured to be self-sufficient with respect to heavy salvage gear, diving, and pumping equipment. The equipment lists for critical items such as diving equipment, mooring systems, hoses, and pumping equipment were doubled to ensure the mission was not impaired due to the failure of a critical piece of equipment.

Consumables and housekeeping supplies were purchased on the local economy. All vessels were adequately husbanded by local agents.

4-6 Oil Disposal

The recovered gas, diesel oil, and slops from the Ex-USS *Chehalis* were returned to the U.S. onboard the TB *Capella* through the port of Richmond, California. The recovered gasoline and diesel fuels were offloaded from the barge into two rail cars and two tank trucks and shipped to the Systech Environmental Corporation facility in Fredonia, Kansas, for recycling. Systech is an EPA approved facility that reutilizes waste fuels in the production of cement. The slops and additional oily waste water generated from the tank cleaning process were trucked to DeMenno Kerdoon, in Compton, California, an EPA approved waste processing facility for treatment. All loading, offloading, and disposal operations were independently observed to ensure regulatory compliance.

Approximately 5 gallons of sampling residuals and contaminated sorbent materials were turned over to the ASG Fire Department to be used in their fire training exercises.

4-7 Demobilization

Support containers from Port Hueneme, California, and Cheatham Annex were returned to home bases via commercial shipping aboard Polynesia Lines vessels. The USNS *Sioux* transported the three MDSU containers and the Hawaii ESSM equipment back to Honolulu on her return voyage.

Personnel, with the exception of vessel crews, returned to their home station via commercial airlines.

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CHAPTER 5

5 ONSITE OPERATIONS

5-1 Mooring Operations

Figure 5-1 depicts the mooring plan used during the Ex-USS *Chehalis* offload project.

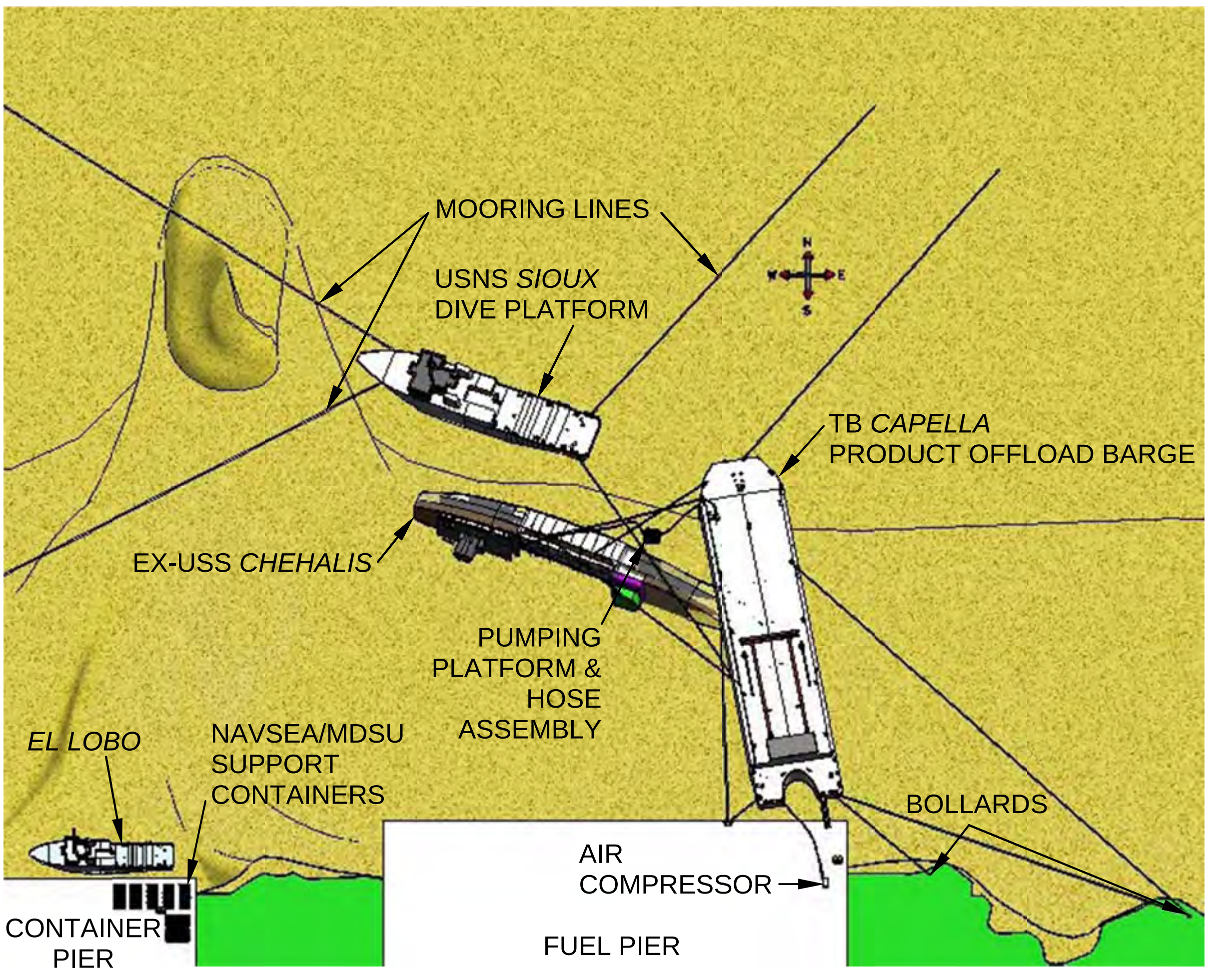

Figure 5-1. Ex-USS *Chehalis'* Mooring Plan

5-1.1 TB *Capella/El Lobo Grande II*

The tank barge *Capella* moored at a 70 degree angle to the ASG fuel pier with its port stern quarter secured close to the ASG fuel pier and the starboard stern quarter approximately 25 feet from the pier. Mooring lines on the starboard side of the TB *Capella* were led to the land based outcrops east of the fuel pier. Port side mooring lines of the TB *Capella*, from amidships aft, were led to the midpoint of the ASG fuel pier to allow an open west end of the pier for small vessel refueling.

The tug *El Lobo Grande II* positioned the TB *Capella's* 5,000 pound anchor, approximately 600 feet to the north east, providing the north east mooring leg. Two lines from the port bow of the TB *Capella* were led to strong points on the sunken Ex-USS *Chehalis*. All synthetic mooring lines were 5″ circumference Sampson Ultra Blue 8 braid with a breaking strength of 58,000 pounds. Tie-ins to the hull of the Ex-USS *Chehalis* consisted of 25′ loops of 1 1/4″ wire and associated 25 ton shackles all positioned by MDSU 1 divers.

5-1.2 USNS *Sioux*

The USNS *Sioux* used her onboard bow anchors to secure her westerly exposure. Her northeasterly starboard stern quarter was secured to a 3,500 pound anchor, one half shot of chain, and 150 feet of 8″ nylon line to a buoy. From the buoy, 600′ of the 5 inch synthetic line secured the starboard stern quarter. Three 300′ 5″ synthetic lines secured the port quarter of the USNS *Sioux* to the bow and amidships of the TB *Capella* as shown in Figure 5-2.

Figure 5-2. Mooring Operations from USNS *Sioux*

5-2 Diving Operations

5-2.1 Dive Systems

Diving operations were conducted by MDSU 1, Company 1–8, home-based in Honolulu, Hawaii, with augmentation divers from the USCG and NAVSEA. A total of 21 divers participated in the operation. All surface supplied diving was conducted from the USNS *Sioux* specially outfitted for the operation with a Standard Navy Double-Lock (SNDL) Recompression Chamber and Air Supply Rack Assembly (ASRA), Oxygen Supply Rack Assembly (OSRA), and a Flyaway Mixed Gas System (FMGS) Console. SCUBA operations were conducted from small boats as well as from the USNS *Sioux*. A total of 39 surface supplied and 33 SCUBA dives resulted in a total bottom time of 66 hours.

Subsequent to loading the SNDL, ASRA, OSRA, and outfitting the dive station at the ASG container pier, the USNS *Sioux* entered the moor with her bow facing to the west and her port side parallel to and directly above the Ex-USS *Chehalis*. The dive station on the aft deck of the USNS *Sioux* was located adjacent to and just north of fuel tank C902 on the Ex-USS *Chehalis* approximately 120 feet below the surface. Surface supplied dives were conducted using the USNS *Sioux's* diver certified crane with the hook statically positioned over the starboard side of the *Sioux* at the dive station. The diver's stage tending line was routed via a series of snatch blocks to the port side capstan of the USNS *Sioux* where divers controlled the descent and ascent of the divers' certified stage. Due to the positioning of the USNS *Sioux* and the dive station, the surface supplied diver's descent crossed underneath the USNS *Sioux's* hull to reach the tanks aboard the Ex-USS *Chehalis*. Figure 5-3 shows the dive station onboard the USNS *Sioux*.

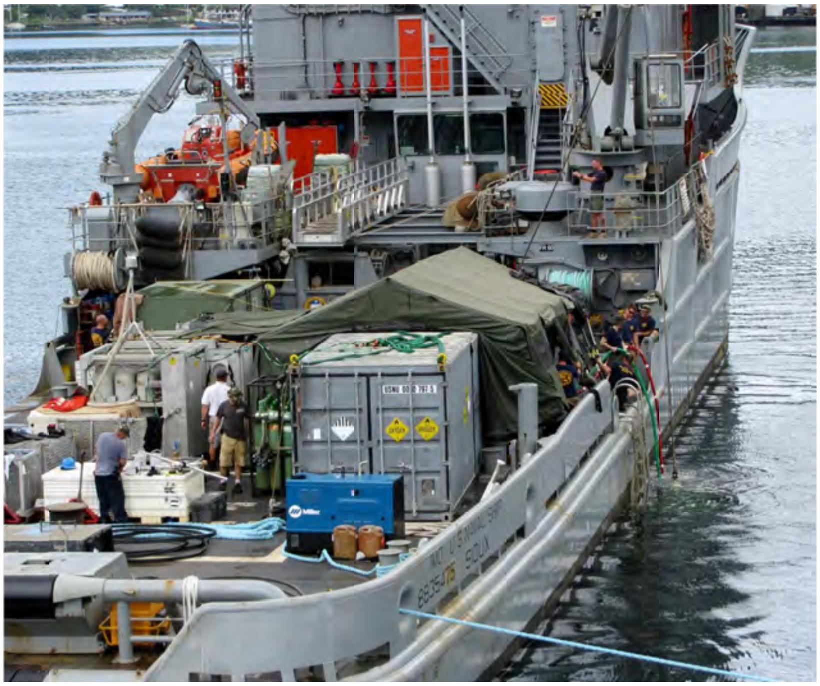

Figure 5-3. Dive Station Onboard the USNS *Sioux*

Initial SCUBA operations, conducted from small boats, surveyed and marked the Ex-USS *Chehalis*. The primary marking buoys located the bow, stern, forward, and aft cargo holds of the Ex-USS *Chehalis* with labeled orange strawberry buoys. These markers served as the critical sign posts for all subsequent mooring and underwater operations. In addition, the SCUBA teams operating from small boats installed the 1 1/4″ wire rope pendants on the Ex-USS *Chehalis* that would serve as the mooring line tie-in points for securing the forward port side of the TB *Capella*. Throughout the operation, SCUBA teams performed continuity and bonding checks of the underwater components of the hose system prior to the start or resumption of all fuel pumping operations.

Surface supplied divers were utilized to perform the longer duration underwater operations, including the hot tap and suction head installation. All divers were trained on critical operations, top side by ESSM personnel. In addition, divers assigned to critical operations, such as the hot tap and suction head operations, were given extensive pre-operational refresher training prior to entering the water, and their operational progress was monitored top side by a combined team of master divers and ESSM operational personnel via audio and video from the Divers' Underwater Color Television System (DUCTS). As a result, operations went smoothly, and no fuel or oil was spilled during the offloading procedures.

Emphasis on operational safety and training resulted in only one diver requiring emergency recompression treatment for Post Orgasmic Illness Syndrone (POIS) symptoms.

5-2.2 Fuel Volume Estimate

The Offload and Disposal Plan for the Ex-USS *Chehalis* estimated that up to 72,500 gallons of fuel remained onboard as shown in Table 5-1. The abbreviations C-902 and C-905 are the ship's fuel oil tanks, and B-8 and B-10 are the ship's cargo tanks.

Table 5-1. Estimate of Fuel Remaining on Ex-USS *Chehalis* Based on 2009 Survey

EX-USS *CHEHALIS* POL		
PRODUCT	**TANKS**	**GALLONS**
DIESEL	C-905	6,000
DIESEL	C-902	1,500
AV GAS	B-8	27,000
AV GAS	B-10	38,000
Total		**72,500**

5-3 Hot Tap Location, Hot Tap, and Pump Operations

5-3.1 Location and Marking of Hot Tap

Subsea hot tap locations on the Ex-USS *Chehalis* were accomplished using a grid system (see Figure 5-4) that triangulated the exact position of the hot tap from conspicuous hull features. Using the 3-D model developed during the research and survey portion of the Ex-USS *Chehalis* operation, the high points in each tank to be tapped could be located. After taking into consideration frame spacing, tank tops, and other structural features that may interfere with the installation of the hot tap, a grid was developed locating the ideal position for the hot tap. Pre-made grid wires with quick installation clips enabled the divers to quickly install the grid system on the hull of the Ex-USS *Chehalis*. By stretching the wires taut, they located the position of the hot tap. A magnet at the apex of the grid system temporarily marked the spot.

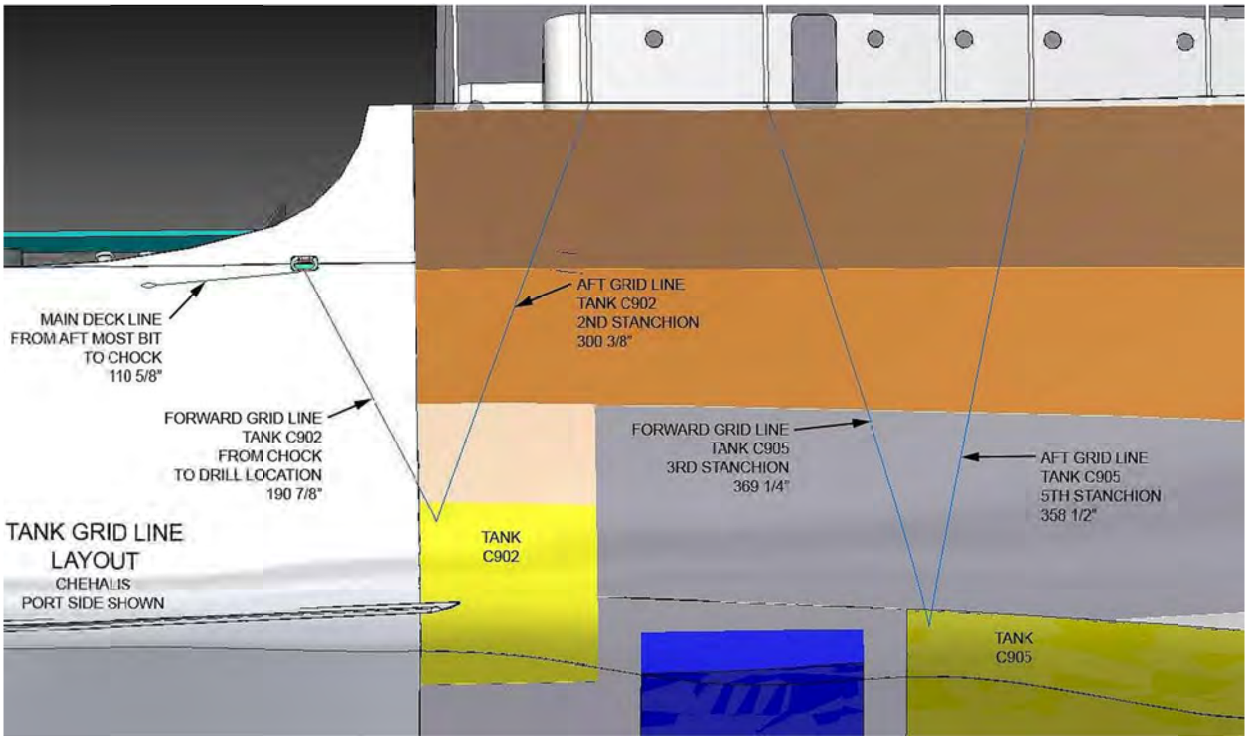

Figure 5-4. Ex-USS *Chehalis* Tank Grid Line Layout

5-3.2 Hot Tap Technique

The hot tap technique is a controlled entry through a valve that uses a hot tap machine to drill a hole into the hull of a submerged vessel so that the vessel's contents can be pumped to the surface. The following process was used to accomplish the hot taps in the hull of Ex-USS *Chehalis*:

1. **Hull Cleaning.** A 3′ x 3′ area at the designated hot tap hull location was thoroughly cleaned. A brick hammer and a scraper were used to remove growth from the hull. Then the surface was cleaned with a hydraulic grinder/wire wheel.

2. **Flange Attachment.** Each hot tap flange was placed on the hull and held temporarily with three 1,000 pound force magnets. Figure 5-5 provides an example using a steel plate to represent the Ex-USS *Chehalis*' hull.

Figure 5-5. Hot Tap Flange Held in Place with Magnets

The Ex-USS *Chehalis* project used the self-drilling/self-tapping screw method to attach each flange since the selected hot tap locations were predominantly in 1/2″ thick hull plate. Between 8–12 bolts were used to secure each flange and torqued to 15 foot-pounds.

A hydraulic drill and a “Bubba Bar” were used to install the self-tapping screws. The “Bubba Bar,” shown with the drill in Figure 5-6, is a 5′ long, 2″ diameter aluminum pipe assembly that attaches to the hull on one end using a magnet with 1,100 pounds of force. The drill is mounted near the mid-point on a fitting that can slide forward or backward so the drill can align with the hole that is to be bored. When the diver pushes on the free end of the pipe, the leverage enables him to easily drill into the steel hull plate, despite the diver being relatively light in the water due to buoyant forces. One setting of the magnet and “Bubba Bar” enabled the divers to install all 8–12 self-tapping bolts in the flange. The bolts were then torqued, and the flange readied for attaching the valve. The time needed to attach each flange was 10–15 minutes.

Figure 5-6. “Bubba Bar” and Drill in Position over Flange

3. **Hot Tap.** The screw-on 4″ full port valve assembly was threaded onto the flange and tightened (Figure 5-7). The hot tap machine, shown in Figures 5-8 and 5-9, was attached to the valve using a camlock fitting. A 3/4″ hose located on the side of the hot tap machine provided a vent to the surface manifold system. The hot tap pilot/cutter was fed to the hull surface through the open valve, the diver-held drill was fitted to the end of the cutter shaft, and the pilot hole was drilled. Air that vented from the tank as the pilot broke through the hull plate was relieved through the air hose to the surface manifold. While venting the tank, hot tap drilling continued with the 3 1/2″ cutter. The time needed to complete each hot tap was 10–15 minutes.

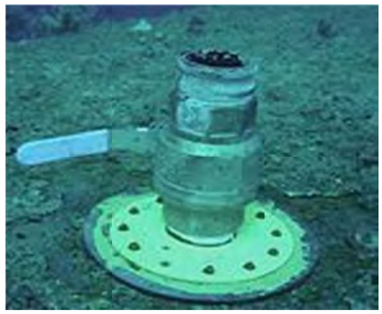

Figure 5-7. Valve Threaded onto Flange

Figure 5-8. Two Divers Operating a Hot Tap Device

Figure 5-9. Hot Tap Device

4. **Hot Tap Machine Extraction.** The hot tap cutter head was then extracted, the valve was closed, and the hot tap machine was removed. Once the entry way was clear, the valve assembly was ready to accept the hose from the pumping system.

5-4 Gasoline Extraction Pumping Operations

The Ex-USS *Chehalis* rested on her starboard side. Due to the high volatility of the 115/145 aviation gasoline in the cargo holds B-8 and B-10, hot tapping the shell plating at the high point in the hull was ruled out for fear that a spark from the drilling/cutting operation would ignite the vapors and cause an explosion. Access to the cargo holds containing gasoline, cargo holds B-1 through B-10, was available through the main deck Rolling Oil Tight Hatches (ROTH). These openings are approximately 2′ x 3′. The hatches were in the open position, and the gasoline levels in the cargo holds were significantly above the level of the hatch, extending to the original side shell plating at what was now the top of the tank. The ROTH openings allowed the divers to access the cargo holds while remaining in saltwater with the gasoline interface layer well above them. All of the diver operations could be conducted without the divers encountering gasoline if a self-rising suction head was developed which could be operated by the divers in saltwater just inside the cargo hold below the fuel level. Another consideration in developing the suction head was the unknown air level entrapped above the gasoline level in the tank. Experience gained during the 2003 USS *Mississinewa* operation, Ulithi Atol, showed that even after 60 years below the surface, entrapped air in the high points of the cargo holds vented for hours before fuel was encountered. Figure 5-10 is a schematic of the hatch configuration, and the water, gasoline, and air interface that needed to be considered in developing the suction head.

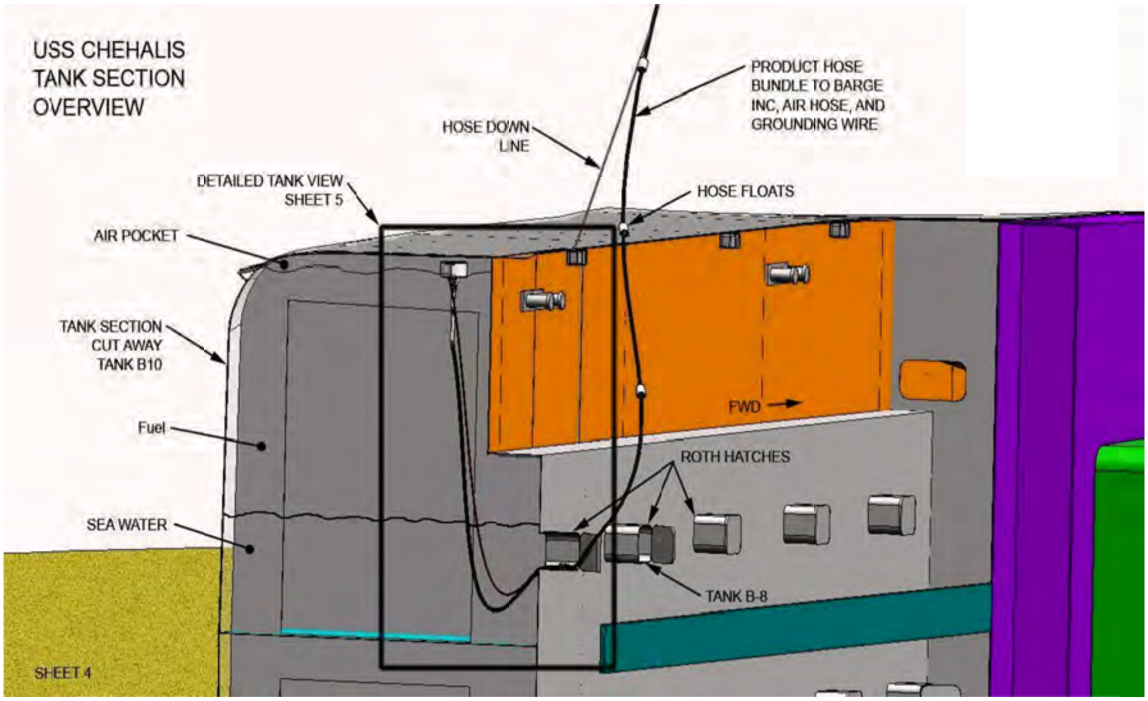

Figure 5-10. Ex-USS *Chehalis* Tank Pumping Overview

Considering the above operational parameters, a suction head with the 2″ suction hose attached was developed that could be inserted by the divers through the ROTHs. The suction heads' buoyancy air was operated by the diver controlling the rise of the suction head to the top of the gasoline level in the tank. The actual pick up of the gasoline would need to be adjustable inside the flotation head and well protected from ingesting debris likely to be encountered in the cargo holds.

The system would need to be fully bonded and protected from electrolysis, mitigating the possibility of a static electricity discharge causing an explosion. Upon concluding the pumping operations and opening an air valve top side, the suction head device would sink into saltwater and be purged of gasoline by the suction pump located on the pump support platform alongside of the tank barge. The prototype suction head was developed and tested in a shallow test tank at the ESSM Base, Cheatham Annex. After minor refinements, it was shipped to the ESSM Base, Hawaii, where further in-water tests and training evolutions were conducted by the MDSU 1.

Figures 5-11 and 5-12 show the second generation of the completed suction head and its components as utilized in the discharge of gasoline from cargo holds B-8 and B-10 on the Ex-USS *Chehalis*.

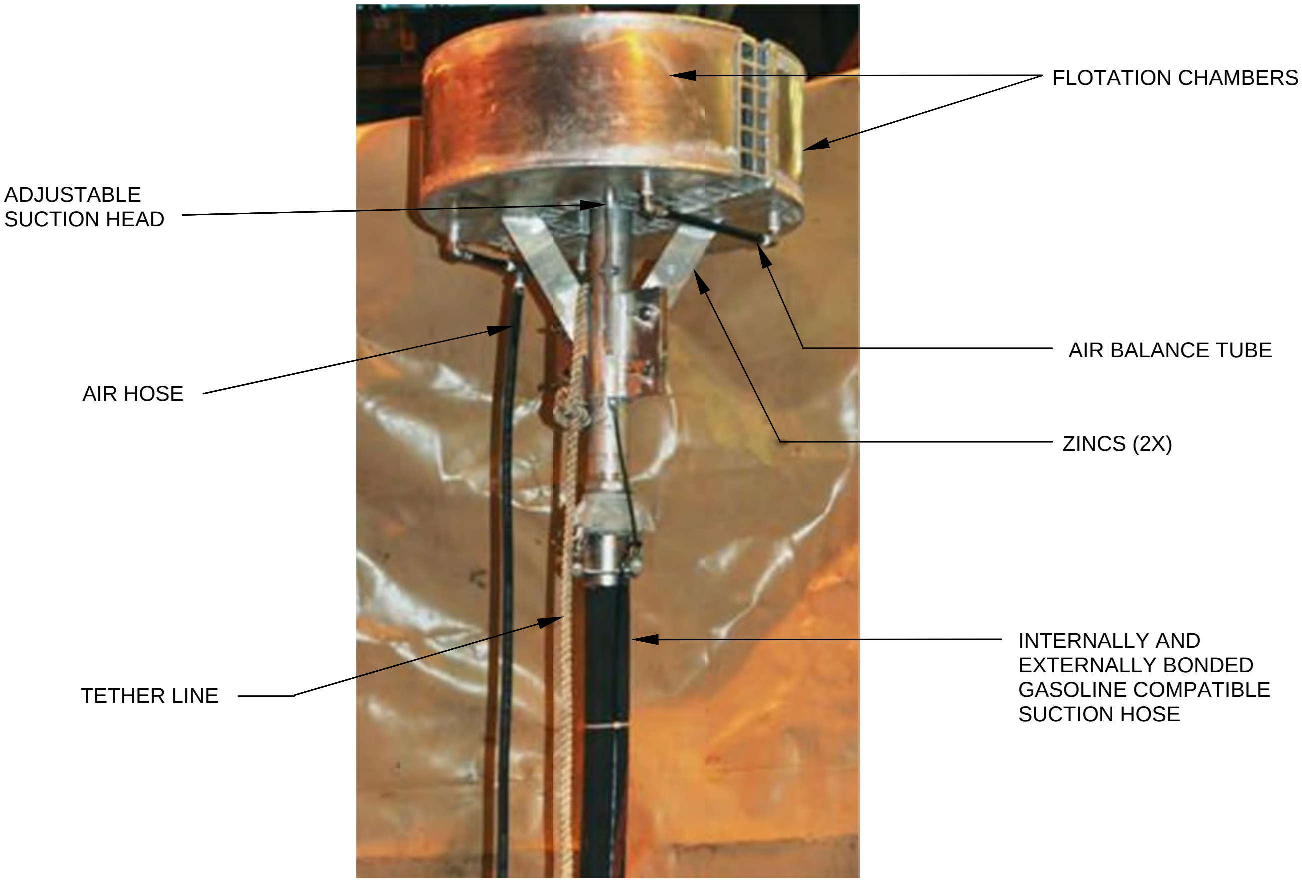

Figure 5-11. Suction Head (Side View)

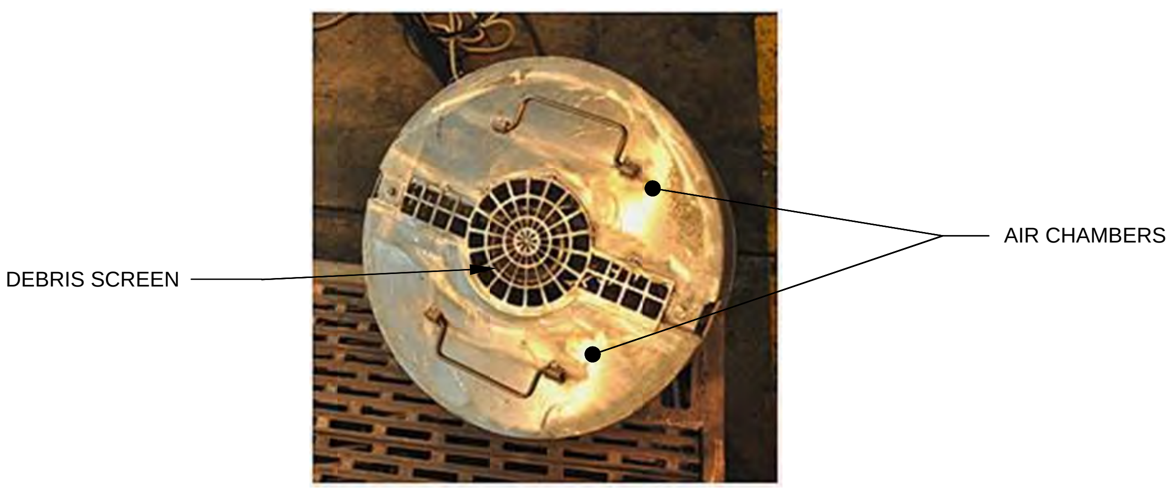

Figure 5-12. Suction Head (Top View)

5-5 Pumping Operations

Pumping of both the diesel and gasoline was accomplished using 2″ internally and externally bonded gasoline compatible hoses with crimped camlock end fittings. Hoses were pressure tested to 1.5 times the highest system pressure when the system was dead headed. This ensured a significant margin of safety in the unlikely event of a miscommunication where a valve was inadvertently closed, dead heading the hose line.

All pumping operations used the 2″ Wilden pneumatic pump which was ATEX certified for operation in explosive atmospheres. A copy of the Declaration of Conformity is attached in Appendix A.

5-5.1 Pumping Equipment

- Wilden 2″ intrinsically safe pneumatic pump
- 2 ″ internally bonded Goodyear Flexwing gasoline hoses, with crimped camlock end fittings
- Aluminum manifolds, full bonded
- 175-CFM air compressors and distribution manifold
- Product control and monitoring equipment

5-5.2 Water Inlet to Replace Pumped Oil

In those tanks that were not open to the sea through vents or hull fractures, a hole was bored below the oil level in the tank using a boring machine mounted to a 4,000 pound magnet. This hole was bored to allow water to quickly replace the oil that was being pumped from the tank, increasing pump flow rate and/or preventing the tank from collapsing. Figure 5-13 shows the hydraulic boring machine and cutter. Although on hand, this was not needed as the fuel oil tanks were breached low in the tanks.

Figure 5-13. Hydraulic Boring Machine

5-5.3 Pumping Cycles

The pumping cycle for all tanks included pumping until significant water was discharged with the oil, settling (see Figure 5-14), and then repeated cycles of slow pumping (stripping), and settling until a beaker of discharged water revealed no (or barely detectable) visible sheen, as validated by the ISFOSC.

Figure 5-14. Sample Bottles Showing Fuel/ Water Mix

5-6 Equipment Deployed

Table 5-2. Major ESSM Equipment Onsite from Various Locations

SYSTEM	SYSTEM NOMENCLATURE	ESSM	ESSM NOMENCLATURE	QTY	ORIGIN
			PUMPING EQUIPMENT		
		PU2107	PUMP, PNEUMATIC, 2″	2	CAX
		PU0400	PUMP, SANDPIPER, 1.5″ PNEUMATIC DR	2	CAX
		PU0830	PUMP, SUBMERSIBLE, 2″ HYDRAULIC	1	CAX
		PU0835	PUMP, TRASH AND SLURRY, 2″ HYDRAULIC	1	CAX
			COMMUNICATIONS EQUIPMENT		
		RA1728	RADIO, VHF, MARINE, HAND-HELD, MOD IC-M88	17	CAX/PHE
		RA1831	RADIO, VHF, MARINE MOBILE, MULTI-CHANNEL	1	CAX
		CB1728	MULTI-CHARGER FOR RA1728 RADIO	2	CAX
			SUPPORT EQUIPMENT		
P19700	SHOP VAN	VA0508	VAN, WORKSHOP	1	PHE
P19600	RIGGING VAN	VA0010	VAN, RIGGING	1	PHE

Table 5-2. Major ESSM Equipment Onsite from Various Locations (Cont.)

SYSTEM	SYSTEM NOMENCLATURE	ESSM	ESSM NOMENCLATURE	QTY	ORIGIN
		VA1987	VAN, CONTAINER, 20′X8′X8′	1	CAX
		HT0006	HOT TAP, LIGHTWEIGHT, HEAVY DUTY	2	CAX
		KT0050	KIT, DRILL PRESS, HYDRAULIC, UNDERWATER	1	CAX
		KT0450	KIT, MAX BEAM SEARCHLIGHT	1	CAX
		LP0030	LEAK PATCHING KIT, MAGNETIC BASE, 16″X30″ PATCH	1	CAX
		RL0010	REEL, HYDRAULIC HOSE	1	CAX
		SE0080	JACK, REEL	1	CAX
		SE1671	HAND TRUCK	1	CAX
		SE1968	PALLET JACK	1	CAX
		TL0080	TOOL BOX, BOARDING KIT	1	CAX
		FN2028	FENDER, SHIP, 24″X36″, FOAM, NAVY TYPE	6	PHE
		PW0020	POWER UNIT, HYD, MOD 9, DIESEL, 10 GPM @ 2000 PSI	2	PHE
		CP3000	CONTAINMENT POOL, 5′X5′X12″	6	CAX/PHE
		CP3010	CONTAINMENT POOL, 10′X6′X12″	6	CAX/PHE
P19900	PERSONNEL TRANSFER BOAT	WB0736	BOAT, 24′ RIGID HULL INFLATABLE	1	HI
		AC0330	AIR COMPRESSOR, DIESEL	1	HI
P19100	MOORING SYSTEM	MS0009	MOORING SYSTEM, BOOM, W/500# ANCHOR	2	HI
		LN1931	LINE, POLYESTER, 1 5/8″X600′, SE BOTH ENDS USED	5	CAX
		LN2140	LINE, POLYESTER, DBL BRD, 800″X1800′	2	PHE
		CP2079	CAPSTAN, 18″, PORTABLE HYD, 6000-POUND LINE PULL	1	HI
			HOSE, 2″ GOODYEAR, 100′, 50′, 25′	18	CAX
			PLATFORM, FLOATING	1	CAX

Table 5-3. MDSU 1–8 Equipment Onsite

NOMENCLATURE	QUANTITY	ORIGIN
SNDL	1	HI
ASRA	1	HI
OSRA	1	HI
FMGS	1	HI
SCUBA	1	HI
DUCTS	1	HI
BAUER COMPRESSOR	1	HI
WELDER/GENERATOR	1	HI
OUTLAND ROV	1	HI
DIVE TENT	1	HI
3500# ANCHOR/CHAIN	1	HI
F-470 BOAT	1	HI

5-7 Offload Operations

The morning of 26 March was the first operational day and commenced with an "all hands meeting" conducted by CDR Mike Day, the ISFOSC. Emphasis was placed on operational safety, the plan for the day, and personnel accountability. USCG personnel assigned cell phones and developed a contact roster. Operations commenced with locating the six support containers and positioning them to best support operations on the east end of the ASG container pier. ESSM, MDSU 1, and USCG personnel unloaded and staged their equipment for operations creating a small Ex-USS *Chehalis* operational support compound as shown in Figure 5-15.

Figure 5-15. Ex-USS *Chehalis* Operational Support Compound

The tug *El Lobo Grande II* and TB *Capella* (shown in Figure 5-16 below) arrived and berthed adjacent to the support vans at the ASG container pier. ESSM and USCG personnel, under the direction of GPC pumping engineer, Craig Moffatt, commenced loading hose and pumping equipment aboard the TB *Capella*. MDSU 1 personnel prepared their dive equipment and chamber for the next day's planned dive missions to mark the Ex-USS *Chehalis* with buoys and install the barge's wire rope mooring pendants on the Ex-USS *Chehalis*. The USNS *Sioux* arrived and was berthed about 300 yards aft of the TB *Capella* in the middle of the ASG container pier.

Figure 5-16. TB *Capella*'s Arrival in Pago Pago Harbor

On 27 March, MDSU 1 made their first dives from a small boat and marked the bow, stern, and the forward and aft cargo holds of the Ex-USS *Chehalis*. The marker buoys from these four points would serve as critical reference points used to position the port bow of the TB *Capella* over the Ex-USS *Chehalis* for efficient offload operations and placement of the USNS *Sioux* for efficient dive operations. Divers, working from a RHIB, continued rigging the steel pendent wires to the Ex-USS *Chehalis* that would facilitate the attachment and prevent chaffing of the TB *Capella*'s and USNS *Sioux*'s synthetic mooring lines when they entered the moor. While the divers were marking the Ex-USS *Chehalis* (Figure 5-17), crews continued outfitting the TB *Capella*.

Figure 5-17. Divers Marking Ex-USS *Chehalis*

Outfitting the TB *Capella* was being conducted simultaneously and included the installation and testing of fluid transfer stations, piping, and electrical bonding equipment. The TB *Capella* then shifted 300 yards east to the fuel pier, in preparation for placing her in the moor. MDSU 1 commenced loading their dive station aboard the USNS *Sioux* and prepared her supplemental starboard stern mooring anchor, chain, and buoy for deployment later in the day (see Figure 5-18). By the end of the day, the TB *Capella* was outfitted and prepared for entering the moor on Sunday.

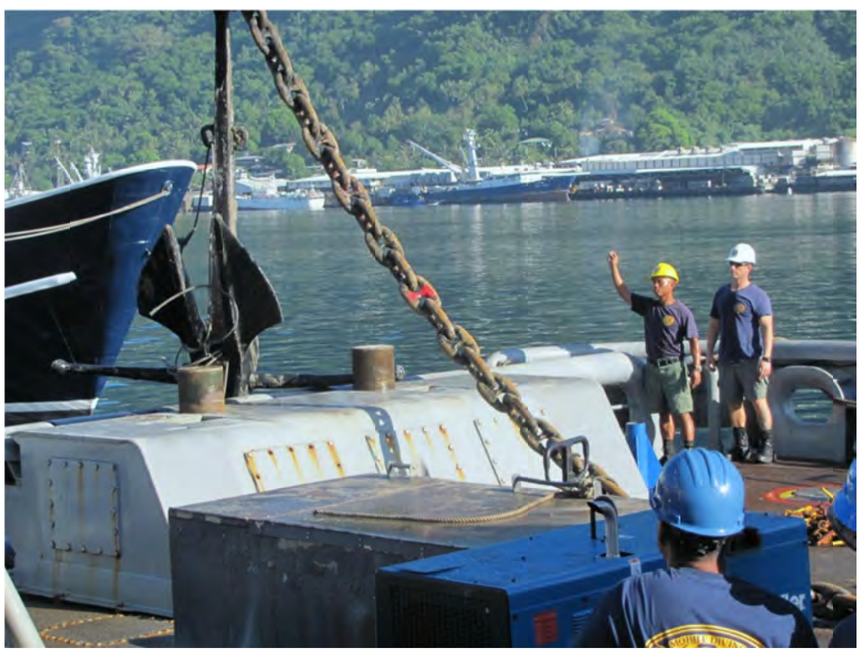

Figure 5-18. MDSU Preparing USNS *Sioux* Anchor for Deployment

On 28 March, the USNS *Sioux* positioned the supplemental starboard stern mooring anchor and buoy in the north east quadrant of the planned moor. With the assistance of American Samoa tugs, the master of the tug *El Lobo Grande*, Daron Marsh, positioned the TB *Capella*'s port bow over the bow of the Ex-USS *Chehalis*. The TB *Capella*'s port stern remained hard against the fuel pier, and her starboard amidships mooring lines were run to the bollards located on the land outcrops east of the fuel pier. The port mooring lines were led back to the pier to avoid infringing on the west end of the fuel pier so that fishing vessels could continue to refuel. With the ASG tugs assisting in holding the barge in position, the tug *El Lobo Grande* moved to the bow of the TB *Capella* where the TB *Capella* lowered her 5,000 pound bow anchor onto the stern of the tug as shown in Figure 5-19.

Figure 5-19. Tug *El Lobo Grande II* Positioning Anchor

With the anchor aboard, the tug *El Lobo Grande* moved to the north east while the TB *Capella* payed out anchor wire. Once in position, the tug *El Lobo Grande* dropped the TB *Capella*'s anchor completing the north east quadrant mooring leg. Divers then attached the TB *Capella*'s port bow and amidships mooring lines to the pendants on the Ex-USS *Chehalis*, completing the mooring of the TB *Capella*. While the TB *Capella* moored, MDSU 1 completed loading the USNS *Sioux* pierside with the Standard Navy Double-Lock Recompression System (SNDL) and prepared the Dive Station. With the TB *Capella* secured in the moor, the pumping platform was launched from the container pier and secured on the port bow of the TB *Capella*. The 2″ pneumatic pump was positioned on the platform and readied for discharge operations as shown in Figure 5-20.

Figure 5-20. Pumping Platform Secured to TB *Capella*

Two air compressors were set up on the far east end of the fuel pier, and the air lines positioned down the starboard main deck of the TB *Capella* crossing over to the port side about amidships to the central air distribution manifold.

On 29 March, the ESSM and USCG teams onboard the TB *Capella*, along with the USCG certified Person in Charge (PIC), Wayne Warfield, made final preparations on the barge and on the pier for pumping. All emergency shut off valves were conspicuously marked, hoses were externally bonded, fire extinguishers positioned, and emergency drills conducted. The main offloading pump, located on the temporary floating pump platform alongside the TB *Capella*, was pre-tested for function with water at different flow rates. The pump was tested by pumping water through the flow metering station. The results were compared with other volumetric tests. Following the pump tests, the discharge hoses were mated to the TB *Capella*'s tank stripping manifold system.

In accordance with the offload plan, barge loading operations would take place through the 2″ stripping manifold system which provided absolute minimum free fall of the product into the tank thereby reducing the possibility of a static electricity discharge causing an ignition of the gasoline. Once all systems were connected to the hard piping aboard the TB *Capella*, another series of “shut off head” pressure tests were conducted at 1.5 times the maximum design head pressure of the system to identify and correct any leakage. Due to the volatility of the product vapors, it was determined that there had to be a zero leakage system in order to mitigate the chance of producing any flammable vapors in and around the pumping system.

MDSU 1 made a dive to verify the mooring systems from the USNS *Sioux*, now moored over the Ex-USS *Chehalis* (Figure 5-21).

Figure 5-21. USNS *Sioux* Entering Moor

The dive station was located on the starboard side of the USNS *Sioux*, with the down line running underneath to the Ex-USS *Chehalis*, now located just south of the *Sioux*. Refer to Figure 5-22.

Figure 5-22. USNS *Sioux* & TB *Capella* in Moor

Due to the *Sioux*'s malfunctioning MSD, the vessel had to return pierside to pump out her holding tank.

On 30 March, final preparations for the offload operation came together. The USNS *Sioux* entered the moor early. Divers rigged the discharge hose down line and approximately 250 feet of suction hose connected to the pumping system located on the pumping platform (Figure 5-23).

Figure 5-23. Left: Lowering the Divers' Stage into the Water,
Right: Divers Shackling in the Stage to the Down
Line Leading to Ex-USS *Chehalis*

Bonding of the hose and pumping system was verified both visually and with the ohm meter. Onboard the USNS *Sioux*, the suction head was lowered to the divers, now located at cargo tank B-4, which had been verified as not containing fuel during the survey. A diver entered B-4 with the suction head, and air was sent to the suction head which rose to the top of the tank. This was accomplished to validate the operational effectiveness of the system in a representative cargo hold with the diver watching.

The divers extracted the suction head from the tank and placed it at tank top level in clear water. The pumping system was activated and again re-calibrated using the entire system at the actual water depth that the fuel would be pumped from. Flow rate of the pump system was moderated to achieve a specific flow rate. This was achieved by adjusting the position of a control station ball valve on the barge. This allowed the offloading team to ensure the pumping rate did not exceed the maximum rate of 32 gpm. The pumping rate was restricted in order mitigate static electrical charge propagation in the gasoline product and subsequently the hose. Gasoline is a highly refined petroleum product; therefore, it does not have a lot of impurities that can help dissipate static electricity. Gasoline is known as a “static accumulator” product. Since gasoline is non-conductive, the friction between the product and the hose wall lining can create a build up of electrons (i.e., a static charge). If static charge builds up enough ‘potential difference’, it can discharge when it comes across an electrical conduit thus creating a spark (such as in the free fall inside a tank). By keeping flow rates in the 2″ hose below a pre-determined rate, this ensures the product is traveling at a velocity that allows it to naturally dissipate its own static charge.

Safety and fire drills were conducted. The USCG set up air monitoring stations on the fuel pier and on the TB *Capella*. The ASG fire department instructed ESSM and USCG personnel, as seen in Figure 5-24, on the operation of the fuel pier’s fire suppression system.

Figure 5-24. Fire Station Training

A fire hose was rigged up to the bow of the TB *Capella* and activated. A manned ASG fire truck was stationed at the fuel pier for immediate response and remained there throughout pumping operations.

Arrangements were made by the USNS *Sioux* to have the tuna cannery disposal vessel, *Blue Moon*, offload her waste water by coming alongside of the USNS *Sioux* while she was in the moor over the Ex-USS *Chehalis* (see Figure 5-25). This eliminated the need for the USNS *Sioux* to break her daily mooring.

Figure 5-25. *Salvor/Blue Moon* Alongside USNS *Sioux*

With preparations finalized, bottom work began in earnest on 31 March. MDSU 1 located, marked, and prepared the two diesel tanks for hot tapping using the ESSM developed grid system. ESSM's Paul Schadow provided the topside direction and guidance on placement of the grid systems used to locate the hot tap penetration positions. The grid system for positioning the hot tap on the hull was accomplished using triangulation from readily identifiable structures on the Ex-USS *Chehalis* previously developed from the 3-D model of the ship class. By the end of the day, both ships' fuel tanks, C902 and C905, were prepared for the next day's first hot tapping operation. The cargo tanks, B-8 and B-10, were conspicuously marked for follow-on operations. Under the direction of USCG WO Manny Munoz, barge personnel verified all safety and emergency procedures in preparation for the next day's pumping operations.

Operations on 1 April marked the successful hot tapping and pumping of C902F. Operationally, the day started with the verification of the hose lines, bonding wires, manifolds, and valves all the way from the Ex-USS *Chehalis* to the barge tanks followed by the attachment of the hot tap to C902F (see Figure 5-26).

Figure 5-26. Hot Tap Flange Ball Valve and Suction Hose

MDSU personnel accomplished the hot tap with precision. No fuel escaped during the process. The discharge hose and the bonding wire were coupled to the hot tap valve. Divers swam the hose line again and confirmed its integrity. Topside on the barge, bonding continuity was checked again and the PIC personally verified the system readiness by walking the hose line and verifying that all communications, connections, and valves were operational and ready. Once the PIC and the barge master confirmed that all systems were ready and the bravo flag hoisted, the Declaration of Inspection was completed, and the ISFOSC then authorized the commencement of pumping.

Divers opened the hot tap valve, and the air was supplied to the pump on the floating platform by the ESSM offloading team onboard the barge. The offload process of black diesel fuel from C902F began at 0917 and continued until 0949. The diesel was pumped into cargo hold #1 port on the TB *Capella*. After two settling/pumping cycles, C902F was declared empty of pumpable fuel by the ISFOSC at 1049.

The hot tap was removed, the hoses flushed into the slop tank, and the remaining hot tap mounting flange sealed with a cap assembly (Figure 5-27), completing C902F. Systems were then readied for the next day's pumping operation on C905.

Figure 5-27. Capping the Hot Tap Penetration

On 2 April divers installed a hot tap on C905. By 0900 the discharge hoses were attached. Divers again verified continuity of the in-water hose and bonding system while the barge team double-checked the topside communications, hoses, valves, and receiving tanks (Figure 5-28).

Figure 5-28. SCUBA Team Entering Water

The PIC completed the Declaration of Inspection, and pumping began at 0940 with the first 6 minutes of flow going to the slop tank aboard the TB *Capella*. The sampling manifold indicated 80–90% water in the mixture. The flow meter at the flow monitoring station only ran for the first few minutes of operation, and then suddenly stopped working. It was later found that a metal shaving from the hot tap cutting procedure had passed from the hot tap hole in the hull plate up through 200 feet of suction hose, through the diaphragm pump, and lodged in the vane of the flow meter preventing it from rotating. Unknown at the time was the fact that another piece of metal shaving from the hot tap cutting was in the pneumatic pump housing working its way through the diaphragm which it would eventually puncture the diaphragm. Pumping continued, and a total of 950 gallons of diesel oil and slops was recovered before C905 was declared empty of oil by the ISFOSC at 1441. Figure 5-29 shows the ISFOSC examining a diesel fuel sample from the Ex-USS *Chehalis*. The remainder of the day was devoted to preparations and detailed safety checks for pumping the highly volatile gasoline from cargo hold B-8 the next day. Pumping operations needed to start at 0700 to ensure the desired completion during daylight hours of the estimated 27,000 gallons of gasoline in B-8.

Figure 5-29. ISFOSC Examining Diesel Sample

On 3 April, operations started early with the MDSU 1 divers entering the water at sunrise to insert the suction head into cargo hold B-8, connect the hoses, and verify the bonding system. On the TB *Capella* (Figure 5-30), the hose lines, bonding, and valves went through another stringent review by the USCG, the PIC, and the barge tankerman.

Figure 5-30. View of TB *Capella* from USNS *Sioux*

All firefighting equipment was verified as operational, and radio communications double-checked. Upon completion of the checks, the Declaration of Inspection was signed, certifying the system as “ready to receive” product, and the ISFOSC authorized pumping. The pump was activated at 0702, and the initial water/slop mixture directed into the number #5 port tank of the TB *Capella*. At 0704, samples indicated high gasoline content in the flow, and by 0705, the flow, which was entirely gasoline, was directed into the #3 starboard tank onboard the TB *Capella*.

Sampling continued to show the flow as clear and within the analytical capabilities at the sampling station (see Figure 5-31), 100% gasoline.

Figure 5-31. Sampling Station Operations

At 0750, an air supply hose, from the compressor to the air distribution manifold, developed a leak, and pumping was suspended for 42 minutes while the hose section was replaced. Pumping resumed at 0832 and continued without interruption until 1533, when small amounts of water were detected at the sampling station. The tank was allowed to settle, and at 1634, pumping resumed. By 1637, there was enough water in the system to divert flow to the slop tank. By 1640, all water was encountered, and the system was shut down. At this time, the divers entered B-8, pulled the suction head down, and adjusted the height of the unit so that the suction pipe was higher up in the float chamber. The suction head was again floated to the top of the tank, and pumping resumed at 1651. Pumping continued until 1736 when all water was encountered. Two settling cycles followed, and at 1807, the ISFOSC declared the tank complete. A total of 16,005 gallons of gasoline had been recovered from B-8.

Easter Sunday, 4 April, was declared a down day for all to enjoy in anticipation of the two day operation that would follow in emptying cargo tank B-10 which contained an estimated 37,000 gallons of high octane 115/145 aviation fuel.

Operations on 5 April commenced at sunrise with divers inserting the suction head into B-10. All hose and bonding wires were inspected by a SCUBA team from the Ex-USS *Chehalis* to the pumping platform and from the pumping platform to the cargo tanks on the TB *Capella* by the PIC and barge crew. Communications were verified, the Declaration of Inspection was signed, and pumping began at 0658. After 3 minutes, sampling indicated that the flow was 100% gasoline, and the product was diverted from the slop tank #5 port on the TB *Capella* to the #3 starboard cargo tank. Pumping continued uninterrupted until 1222 when it was noticed that the pump was misting fuel out of the air exhaust.

The perforation caused by the hot tap cutting shard in the pump diaphragm created a leak path for gasoline. This leak path allowed fuel to leak down into the air side of the diaphragm pump and fill the voids in this area. When the pump was running, the air pressure from the air line would fill the diaphragm and exhaust a dangerous combination of air and gasoline mist out of the air exhaust of the pump. Because of the operational protocol of having multiple layers of safety and operational assets on hand, a potentially serious problem was quickly detected. A new pump was installed. The pump was replaced with a spare pump, and pumping resumed at 1404 and continued until 1745 when the decision was made to secure for the day. Air was released from the suction head allowing it to settle to the bottom of the tank in clear water. Divers entered the water and closed off the valve to the suction head and opened the purge valve. Remaining gasoline in the hose line was then pumped to the #3 starboard tank on the TB *Capella*. After 1 minute, when the water arrived at the sampling station, the flow was diverted to the slop tank on the TB *Capella*. Preparations were made to pump the remainder of gasoline from B-10 the following day. Operations concluded for the day.

On what was to be the last day of pumping, 6 April, operations again commenced at sunrise with divers inspecting the hose system and barge personnel completing the Declaration of Inspection. Air was supplied to the suction head, and it rose to the top of B-10. Pumping commenced at 0657 with the initial flow of water from the hose going to the slop tank on the TB *Capella*. After 3 minutes (at 0700) the flow was 100% gasoline and was diverted to #3 starboard on the TB *Capella*. Aboard the USNS *Sioux*, MDSU 1 divers concluded that the suction head needed to be repositioned higher in the cargo tank. The dive team lowered the entire suction head by pulling it down using the tether line and moving it slightly so it was between the frames and thus higher up in the tank. Pumping resumed in full at 0808 and continued uninterrupted until 1210 when 50% water was indicated in samples taken at the manifold. After a 12 minute settling period, pumping resumed at 1222, and at 1223 with the water content above 50% and rapidly increasing, flow was diverted to the slop tank. Pumping stopped at 1224 when the samples indicated 99 plus percent water. The ISFOSC declared the tank empty of pumpable fuel concluding the removal of fuel from the Ex-USS *Chehalis*.

Table 5-4 summarizes the fuels, excluding slops, recovered from the Ex-USS *Chehalis*.

Table 5-4. Predicted Versus Recovered Fuel Quantities

TANK/COMPT	FULL CAPACITY/GALLONS	2009 SURVEY/GALLONS	OFFLOADED GALLONS
A 303		EMPTY	
A 304		EMPTY	
A 305		EMPTY	
A-2 LUBE OIL	19,800	EMPTY	
A-3 LUBE OIL	19,800	EMPTY	
B-1 CARGO	57,200	TRACES ONLY	
B-2 CARGO	57,200	TRACES ONLY	
B-3 CARGO	79,000	TRACES ONLY	
B-4 CARGO	79,000	TRACES ONLY	
B-5 CARGO	77,900	TRACES ONLY	
B-6 CARGO	77,900	TRACES ONLY	
B-7 CARGO	75,500	TRACES ONLY	
B-8 CARGO	75,500	28,000	16,005
B-9 CARGO	55,300	TRACES ONLY	
B-10 CARGO	55,300	37,000	37,200
C 304 FUEL OIL	5,000	EMPTY	
C 305 FUEL OIL	5,000	EMPTY	
C 905 FUEL OIL	14,500	6,000	700
C 906 FUEL OIL	6,500	EMPTY	
C 902F	5,300	1,500	600
C 901F	5,300	INACCESSIBLE	
TOTAL			**54,505**

CHAPTER 6

6 DEMOBILIZATION AND PRODUCT DISPOSAL

6-1 Demobilization

Demobilization began immediately upon completion of pumping operations midday on 6 April. The discharge hoses were flushed with saltwater. The saltwater was sent to the slop tank #5 port onboard the TB *Capella*. When the flushing is complete, the divers disconnected the suction head and hoses from the Ex-USS *Chehalis*. The hoses, down lines, and the suction head were retrieved back onboard the TB *Capella*. The pump and its associated gear was removed from the pumping platform and recovered onboard the TB *Capella*. The TB *Capella* was fully prepared to break the moor the following day (7 April) and return to the ASG container pier to offload. Aboard the USNS *Sioux*, divers assembled the equipment needed to secure the cargo hatches on the Ex-USS *Chehalis* and began demobilizing the hot tap and other pumping equipment. A planning meeting was held to discuss how the moor would be broken since the starboard aft quarter of the USNS *Sioux* was moored to the TB *Capella*.

On 7 April, with the assistance of two ASG tugs, the TB *Capella* released her mooring lines. The tug *El Lobo Grande II* worked her way north east to retrieve her anchor. By early afternoon, the TB *Capella* was moored port side on the east end of the ASG container pier in the vicinity of the Ex-USS *Chehalis* support compound. The USNS *Sioux* secured her port aft mooring lines to the fuel pier, resumed cleanup, and hatch securing operations on the Ex-USS *Chehalis*. With the goal of having the TB *Capella* underway on the morning of 8 April, crews worked to offload the equipment from the TB *Capella*, as seen in Figure 6-1. The equipment was shipped back to Port Hueneme, CA, Cheatham Annex, VA, and the ESSM Base Hawaii.

Figure 6-1. Offloading Equipment from TB *Capella*

It was decided that the hoses used to pump fuel, then subsequently flushed with seawater, would return to being deck-stowed onboard the TB *Capella*, and allowed to air-out over the next 30 days of transit time. In addition to the oversized pump platform, two large reels of line were also shipped back to the West Coast aboard the TB *Capella*.

By mid-morning on 8 April, the TB *Capella* departed (refer to Figure 6-2) Pago Pago Harbor on its way to San Francisco, CA, via a refueling stop in Hawaii.

Figure 6-2. TB *Capella* Departing Pago Pago Harbor

Onboard, TB *Capella* had manifested the 54,505 gallons of gasoline and diesel fuel, and 3,627 gallons of slop recovered from the Ex-USS *Chehalis*. The 8^{th}, 9^{th}, and 10^{th} of April were dedicated to cleaning and packing ESSM and USCG equipment returning to their home bases via a commercial container ship. The ESSM Hawaii equipment would return to Hawaii aboard the USNS *Sioux* along with all of the MDSU 1 equipment. The MDSU 1 divers aboard the USNS *Sioux* completed their work cleaning the residual gear on the Ex-USS *Chehalis* and returned to the pier on 9 April. The supporting 40-ton mobile crane arrived on 10 April and completed loading of the USNS *Sioux* with MDSU 1 and ESSM Hawaii equipment for return to Honolulu. With the equipment stowed and the containers packed for shipment, the majority of the ESSM and USCG personnel departed American Samoa on 11 April. The USNS *Sioux* and the MDSU 1 team departed American Samoa on 15 April.

6-2 Return Transit and TB *Capella* Offload and Product Disposal

After encountering head seas and rough weather, the tug *El Lobo Grande II*, with the TB *Capella* in tow, berthed at Pier 29 in Honolulu, Hawaii, on 25 April to refuel and undergo maintenance. The vessels departed on 27 April making their way to the Levine Terminal in Richmond, California, where they would offload the Ex-USS *Chehalis* fuel products. The USNS *Sioux* returned to Hawaii with MDSU and ESSM Hawaii equipment on 20 April.

On 9 May, the tug *El Lobo Grande II* and the TB *Capella* (after another slow transit due to adverse weather and head seas) berthed at the Levine Terminal, as seen in Figure 6-3, Pier 20.

Figure 6-3. TB *Capella* Berthed at Levine Terminal, Richmond, CA

Fuel offload began on 10 May with the discharge of slop, starting at 1022 from cargo tank #5 port, into waiting vacuum trucks. Discharge of gasoline from #3 starboard commenced at 1430. An additional pump was added at 1626. Gasoline and diesel were discharged directly to the two waiting railcars and two tank trucks. At 1830, the slop discharge was complete, and the discharge of diesel fuel began. All discharge operations concluded for the day at 2130.

Discharge of the TB *Capella* continued on 11 May with the day devoted to discharging the gasoline from tank #3 starboard. Discharge of gasoline continued for the entire day, and operations ended at 2000 (Figure 6-4).

Figure 6-4. Discharge Operations

All offload cargo operations concluded on 12 May at 2115. A total of 827 gallons of diesel, 54,505 gallons of fuel, and 3,628 gallons of slop had successfully been offloaded from the TB *Capella* before the start of tank cleaning and gas-free operations which began immediately after the conclusion of the cargo discharge operations. Gas-free operations were completed at 2230 on #1 port diesel cargo tank and at 0120 on 13 May in #5 port slop tank. Gas-freeing was completed on #3 starboard. Tank washdowns/cleaning commenced in tanks #5 port and #1 port and lastly in #3 starboard. All cleaning operations concluded by 2300, 13 May 2010. The TB *Capella* was officially released from charter at that time.

The tank stripping, washdown, and cleaning process generated 5,272 gallons of mixed fuel residuals and slop that needed to be processed, in addition to the 3,628 gallons of slop generated in the offload of the Ex-USS *Chehalis* in American Samoa. The 9,000 gallons of residuals and slop were trucked to DeMenno Kerdoon, 2000 N Alameda Street, Compton, California (an EPA certified recycling facility under manifests 006626877 and 006626866 for processing). Certificates of Treatment were issued on 18 and 21 May 2010 respectively acknowledging receipt and treatment of the waste in accordance with California law and the Federal Resource Conservation and Recovery Act (RCRA). Copies of these manifests and certificates are attached as enclosures in Appendix A.

The gasoline and diesel fuel on the TB *Capella* was mixed and discharged into two railcars (see Figure 6-5), each holding approximately 21,000 gallons, and two trucks containing 6,493 gallons and 6,012 gallons respectively. A total of 54,505 gallons was forwarded to Systech for processing.

Figure 6-5. Rail & Tank Truck Operations

The trucks, under manifest 0051110, and receiving tickets 152354 and 152356, were received and processed on 18 March at the EPA certified recycling facility, Systech Environmental Corporation, 1420 South Cement Road, Fredonia, Kansas. Refer to Figure 6-6 for the waste fuel processing procedure.

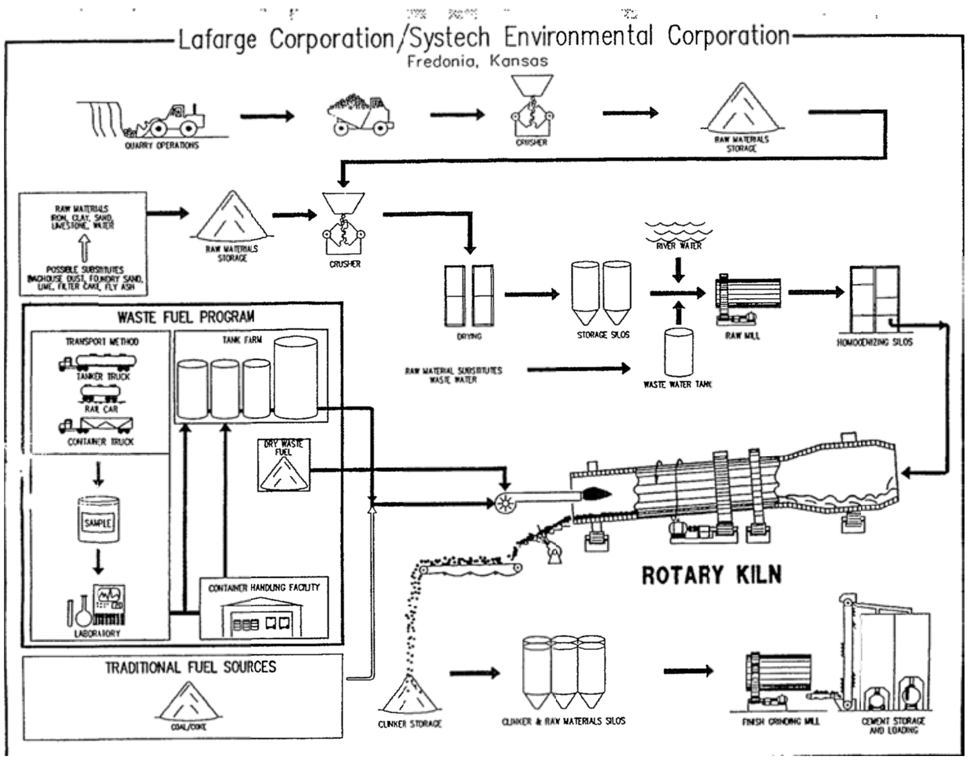

Figure 6-6. Systech Environmental Waste Fuel Processing

The recycling of the gasoline at the Systech facility was witnessed by ESSM personnel, thereby ensuring proper disposal of the recovered product. Copies of the manifests, receiving documents, and Certificates of Destruction are attached as enclosures in Appendix A. The two railcars, under manifests 200246 and 200260, were received at Systech on 30 June, and processed on 3 July and 9 July respectively. Copies of the receiving tickets and Certificates of Destruction are attached as enclosures in Appendix A.

With the successful reutilization of the fuel in the processing of cement at the Systech facility, the final operational element of the Ex-USS *Chehalis* defueling operation came to a successful end. The nature of the product (high lead and high octane gasoline) required an attention to detail and safety beyond the normal aspects of the cargo offload process. Extensive planning focusing heavily on safety and the mitigation of ignition sources throughout the operation contributed immensely to the safe and efficient defueling of the Ex-USS *Chehalis*.

All operational and support personnel are to be commended for their dedicated efforts in accomplishing the mission in a timely and safe manner.

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CHAPTER 7

7 EX-USS *CHEHALIS* LESSONS LEARNED

7-1 Planning, Coordination, and Training

Lesson Learned:	The Research and Survey phase of the Ex-USS *Chehalis* operation provided valuable insight into the condition of the vessel, the quantities and types of fluid products to be handled, and the logistical considerations that required augmentation beyond the locally available resources and capabilities.
Recommendation:	Incorporate survey teams into the operational tasking to best prepare the response package as a matter of practice. This is even more critical for operations in remote environments where the logistical support line of communications is both long and difficult.
Lesson Learned:	The multi-agency task force organization of the Ex-USS *Chehalis*' Offload operation provided a depth of technical knowledge and operational capability that resulted in a safe and efficient operation. Key to integrating all of the diverse agencies involved, was the telephone coordination meetings which occurred on a regular basis during the planning stage of the operation thereby avoiding major problems during the operation.
Recommendation:	The appointed multi-agency task force model worked extremely well, because the regularly scheduled planning meetings facilitated the full synthesis of ideas and technical capabilities while simultaneously developing camaraderie between the operational players. Suggest this model is followed in future operations.
Lesson Learned:	Pre-deployment hands-on operational training for the divers on the unique equipment developed for the operation goes a long way toward ensuring that the equipment is operator-friendly, foolproof, and familiar prior to the actual operation.
Recommendation:	Conduct equipment and job specific operational training far enough in advance to allow time for equipment modifications to be made prior to the actual operation. With that in mind, the training should be close enough to the commencement of the operation to ensure that the personnel being trained are the same personnel designated to deploy on the job.

Lesson Learned: Initial disposal options focused on routing the recovered product into Singapore for reutilitization due to slightly favorable cost considerations. What was not known at the time was the impact of international treaties regarding the processing of waste through countries signatory to the Basel Agreement. The Basel Agreement prohibits signatories such as Singapore from processing waste generated by non-signatories, in this case the United States. Fortunately, several courses of action for disposal had been developed, and the alternatives were both viable and nearly cost neutral.

Recommendation: When dealing with hazardous or waste product disposal, ensure that the products are properly classified by regulatory bodies such as the Environmental Protection Agencies of both the generator and the potential recipient countries. Also, ensure that the recipient country can legally accept the product and not be in violation of existing treaties. Often commercial processors are not fully aware of all restrictions, and while they may agree to accept the product, it may be an illegal transaction. Therefore, it is best to involve both environmental agencies in the discussion early.

7-2 Pumping, Hot Tapping, and Hoses

Lesson Learned: The 2″ Wilden intrinsically safe pneumatic pumps were ideal for the tasking. The only problem experienced was that metal shards from the hot tap cutting operation were sucked into the rubber diaphragm of the pump while pumping the diesel tanks. Over time, a shard pierced the diaphragm. The problem did not surface until later during the gasoline pumping operations but was caught early, and the pump was exchanged with a backup pump which continued pumping operations without issues. This could have been a serious problem as the pierced diaphragm allows the product (gasoline) to enter the air exhaust system of the pump, essentially atomizing the gasoline which under the right conditions is a highly explosive atmosphere.

Recommendation: The hot tap operation will always result in metal shards remaining in the valve assembly. This is not critical when using submersible pumps that are more tolerant of small metal debris. When using diaphragm pumps where the debris can puncture the rubber diaphragm, we should consider alternative pumps as well as methods for removing the debris before pumping. One idea that should be investigated is magnetizing the hot tap cutter blade so that it picks up the cutting shards as it bores the hole. Another alternative that could resolve the problem would be to add a magnetic head to the “bung buster” hot tap accessory and inserting it into the valve assembly after removing the hot tap, but prior to attaching the suction hose. The magnetized “bung buster” would collect the shards and extract them prior to pumping.

Lesson Learned: Discharge hoses were internally bonded and as an extra precaution externally bonded. The externally bonded wires used large wire eyes crimped onto the bonding wire. These crimped ends were marginally robust, and two of them parted under the strain of the underwater conditions.

Recommendation: More robust fittings, such as stainless U–bolts or silver-soldered connections, should be considered in future operations requiring similar bonding requirements.

Lesson Learned: Regardless of previous pre-operational pressure tests completed on the hose and manifold systems, a pressure test with water at 1.5 times the maximum discharge pressure of the pumping system should be accomplished prior to commencing pumping operations. In addition, all valves in the system should be verified as operational and leak-free at the same time.

Recommendation: Operational pressure tests were accomplished as recommended prior to commencing pumping operations on the Ex-USS *Chehalis*. The practice is reiterated here to reinforce the requirement as an integral part of all pumping operations.

7-3 Underwater Operations

Lesson Learned: The operation used older Stanley DL 9 hydraulic drills for the installation and operation of the hot tap because the newer Stanley DL 7 drills that replaced the DL 9 drills failed to shut off at depths below 50 feet.

Recommendation: This has been an ongoing problem with the DL 7 drills. While Stanley has offered some different spool centering springs, they do not have the capability to test the possible modifications at depth. Recommend that NAVSEA direct testing in pursuit of obtaining ANU approval for the DL 7 drills.

7-4 Models

Lesson Learned: Three dimensional computer models of the Ex-USS *Chehalis* developed from class build drawings were valuable tools for both locating critical targets on the vessel hull and as training aids for operations.

Recommendation: Continue the practice of developing both 3-D and physical models for future operations.

7-5 Tool Development

Lesson Learned: The suction head system was specifically developed for this operation. The development followed the principal of being simple, light weight, and easily handled by the divers and was followed by static and in-water operational testing and training by the divers scheduled to conduct the operation.

Recommendation: The tools and pumping systems were well suited for the operation because they maintained the basic principal of being light weight and easily maneuverable by the two-man dive teams. These principals should be kept in mind for future operations.

CHAPTER 8

8 CONCLUSION

In the execution of the offload operation of the Ex-USS *Chehalis*, one cannot overlook the contribution of the cooperative environment fostered by all participants, enabling the multi-agency organization to function harmoniously from the survey through the conceptual planning stage of the operation and finally to the onsite conduct of the offload and recovered product disposal. The synchronization of the technical knowledge, skills, and assets from within the USCG, U.S. Navy, ESSM, the EPA, NOAA, the ASG, the NPFC, and all supporting commercial activities enabled a complex, dangerous, and logistically remote operation to be accomplished in a successful and safe manner.

The offload of the Ex-USS *Chehalis* demonstrated excellent team work, and as a result, over 56,500 gallons of gasoline and diesel fuel were offloaded from the sunken vessel with no mishaps and safely disposed of through a recycling process that yielded some beneficial use of the recovered product that had been entombed in a deteriorating hull for over 60 years in the pristine waters of the South Pacific.

The Ex-USS *Chehalis* project demonstrated that the command and organizational structure established for the operation by Captain Barry Compagnoni, USCG Sector Honolulu OSC, and executed onsite under the leadership of USCG CDR Mike Day, was efficient and flexible enough to task the skill sets of each supporting organization to best accomplish the mission. In the end, this organization recovered and responsibly recycled without, incident the highly volatile gasoline and diesel fuels.

At the operational level, the Ex-USS *Chehalis* mission explored new ground for the MDSU 1, NAVSEA, USCG, and ESSM operational forces with respect to handling the highly volatile gasoline. Previous operations have focused on products such as diesel, Navy Standard Fuel Oil (NSFO), and heavier bunker oils all with flash points significantly higher than the flash point of the 115/145 aviation gasoline encountered on the Ex-USS *Chehalis*. While all operations are dangerous, the nature of this operation was compounded by the volatility of the gasoline, necessitating a comprehensive risk analysis followed by a plan, special equipment, and a training program that technically mitigated the identified risks. Regardless of the comprehensive nature of the plan, equipment, and training, execution was dependent on the onsite leadership to result in a safe operation. The leadership of the supporting organizations demonstrated exceptional professionalism and technical competence at all levels while strictly enforcing safety standards to ensure a successful mission.

The Ex-USS *Chehalis* operation showcased the combined efforts of the “multi-agency approach” to resolving logistically and technically challenging underwater salvage operations. With numerous WWII wrecks located throughout the region, one should look to the successes and lessons learned from the Ex-USS *Chehalis* operation contained in this report in approaching other pollution sensitive challenges.

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APPENDIX A- CERTIFICATIONS

Systech Environmental Corporation
1420 South Cement Road
[illegible], KS [illegible]
Phone [illegible] Fax [illegible]

Date 06/15/2010

Receiving Ticket No. 152354 * TTRK *

US Government/US Coast Guard	Bill To: Name : NRC ENVRIONMENTAL SERVICES
Dr. Dennis Mead	Attn : Nikolas Heagy
300 Ala Moana Blvd. # 8-134	Street: 1605 Ferry Point
Honolulu, HI 96850	Alameda , CA 94501
	Cty/St:
(808)535-3464	Phone : (510)749-1390
EPA Id: USGOV	

Transporter:

Name : COAL CITY COB CO.	Material Type : Bulk - TTRK
Street: PO Box 516	Waste Type : NHAZ
Cty/St: Avalon , TX 76623	Date Received : 05/14/2010
Phone : (866)634-0155	Schedl Time In:
EPA Id: ILD981195720	Actual Time In: :
	Date Check Out: 05/18/2010
Manifest Number: 051110	Time Check Out:
State Manf No. :	Loading Time : 0 Hrs 0 Min
Profile No: CG147574 Stand Prof:	Haulr Pmp Time: 0 Hrs 0 Min
P.O. Number : 385008	Unloading Time: 2 Hrs 0 Min
Release Number :	
Federal EPA Waste Codes:	Waste Code Count: 0

Lab Analysis:	Btus/Lb:19684	Mercury: nd	Unloading/Processing Information:
Sample #: 46521	Halogen: 0.1%	Spec Grav: 0.72 *	Recv. Gross: 73,280
Anal. Dt: 05/14/2010	Water: <1.0%	* Grams per Milliliter	Recv. Tare: 34,340
Analyst: DS	Solids: <5.0%		Recv. Net: 38,940
			Recv. Volume: 6,493
	Ph: 7.0		

Copy: 999

The analyses contained herein are performed solely for the purpose of qualifying the analyzed materials for acceptance by Systech in accordance with its permits and processing capability.

Systech Environmental Corporation
1420 S. Cement Road
Fredonia, KS
6203784451

CERTIFICATE OF DESTRUCTION

This hereby certifies that waste as defined on Shipping document 051110 from US Government/US Coast Guard EPA ID: USGOV was received by Systech Environmental Corporation, RCRA permit ID: KSD980633259

The waste material was received on : 05/14/2010

Total pounds processed by Systech:* 38940

This waste is to be burned for energy recovery in a cement kiln in accordance with Federal (40 CFR 260 thru 270) and corresponding state hazardous waste regulations.

Treatment code for material processed: H061

Destruction commenced on or about the following date:** 05/21/2010

Carlotta Myers

John Mrkwa, Carlotta Myers
Customer Service Rep.

*** The date given above refers to when your waste shipment was introduced into the cement kiln for re-use as waste fuel.*

ALTERNATE STRAIGHT BILL OF LADING - SHORT FORM

Shipping Order Copy 152354

Shipper No.

Carrier No.

Date 5/14/10

(Name of Carrier)

TO: Consignee [illegible]

Street [illegible]

Destination [illegible] Zip Code [illegible]

FROM: Shipper US Gov [illegible]

Street 300 [illegible]

Origin [illegible] Zip Code [illegible]

Route:

Vehicle Number [illegible]

No. Shipping Units	HM	Kind of Packaging, Description of Articles, Special Marks and Exceptions	Weight (Subject to Correction)	Rate	CHARGES (For Carrier use only)
10000	X	[illegible]			
		[illegible]			
		[illegible]			
		[illegible]			
		[illegible] GG 475 74			

5/14/10

REMIT C.O.D. TO: ADDRESS

COD Amt: $

C.O.D. FEE: PREPAID ☐ COLLECT ☐ $

TOTAL CHARGES $

FREIGHT CHARGES Check Appropriate Box: ☐ Freight prepaid ☐ Collect

[illegible]

SHIPPER [illegible]

CARRIER [illegible]

PER [illegible]

PER [illegible]

DATE [illegible]

Permanent post-office address of shipper

MARK WITH "X" TO DESIGNATE HAZARDOUS MATERIAL AS DEFINED IN TITLE 49 OF FEDERAL REGULATIONS.

For further details on SHIPPING HAZARDOUS MATERIALS see Federal Regulations 49 CFR, Part 172.

2

TOPS FORM No. 3843 Made in U.S.A.

Systech Environmental Corporation
1420 South Cement Road
Fredonia, KS [illegible]
Phone [illegible] Fax [illegible]

Date 06/15/2010

Receiving Ticket No. 152356 * TTRK *

US Government/US Coast Guard
Dr. Dennis Mead
300 Ala Moana Blvd. # 8-134
Honolulu, HI 96850

(808)535-3464

EPA Id: USGOV

Transporter:
Name : COAL CITY COB CO.
Street: PO Box 516
Cty/St: Avalon , TX 76623
Phone : (866)634-0155
EPA Id: ILD981195720

Manifest Number: 0051110
State Manf No. :
Profile No: CG147574 Stand Prof:
P.O. Number : 385008
Release Number :
Federal EPA Waste Codes:

Bill To: Name : NRC ENVRIONMENTAL SERVICES
Attn : Nikolas Heagy
Street: 1605 Ferry Point
Alameda , CA 94501
Cty/St:
Phone : (510)749-1390

Material Type : Bulk - TTRK
Waste Type : NHAZ
Date Received : 05/14/2010
Schedl Time In:
Actual Time In: 09:55
Date Check Out: 05/18/2010
Time Check Out:
Loading Time : 0 Hrs 0 Min
Haulr Pmp Time: 0 Hrs 0 Min
Unloading Time: 2 Hrs 0 Min

Waste Code Count: 0

Lab Analysis: Btus/Lb:19589 Mercury: nd
Sample #: 46522 Halogen: <0.05% Spec Grav: 0.73 *
Anal. Dt: 05/14/2010 Water: <1.0% * Grams per Milliliter
Analyst: DS Solids: <5.0%
Ph: 7.0

Unloading/Processing Information:
Recv. Gross: 70,780
Recv. Tare: 34,220
Recv. Net: 36,560
Recv. Volume: 6,012

Copy: 999

The analyses contained herein are performed solely for the purpose of qualifying the analyzed materials for acceptance by Systech in accordance with its permits and processing capability.

Systech Environmental Corporation
1420 S. Cement Road
Fredonia, KS
6203784451

CERTIFICATE OF DESTRUCTION

This hereby certifies that waste as defined on Shipping document 0051110 from US Government/US Coast Guard EPA ID: USGOV was received by Systech Environmental Corporation, RCRA permit ID: KSD980633259

The waste material was received on : 05/14/2010

Total pounds processed by Systech:* 36560

This waste is to be burned for energy recovery in a cement kiln in accordance with Federal (40 CFR 260 thru 270) and corresponding state hazardous waste regulations.

Treatment code for material processed: H061

Destruction commenced on or about the following date:** 05/21/2010

Carlotta Myers

John Mrkwa, Carlotta Myers
Customer Service Rep.

*** The date given above refers to when your waste shipment was introduced into the cement kiln for re-use as waste fuel.*

ALTERNATE STRAIGHT BILL OF LADING - SHORT FORM

Original – Not Negotiable

152356 Coal City Cob (Name of Carrier)

Carrier No. 104906

Date 5-11-10

TO:	FROM:
Consignee SYSTECH ENVIRONMENTAL	Shipper U.S. GOVERNMENT / USCG
Street 1420 S. CEMENT RD	Street 300 ALA MOANA BLVD # 8-134
Destination FREDONIA, KS Zip Code 66736	Origin HONOLULU, HI Zip Code 96850
Route	Vehicle Number 13254-7009 / 1-800 33-SALL

No. Shipping Units	HM	Kind of Packaging, Description of Articles, Special Marks and Exceptions	Weight (Subject to Correction)	Rate	CHARGES (for Carrier use only)
6000	X	GASOLINE (UNOCO)			
		HAZARDOUS CARGO			
		FLAMMABLE LIQUID			
		1993 UN1203 PG II			
		PROFILE # CG147574			
		5-14-10			

REMIT C.O.D. TO: ADDRESS

COD Amt: $

C.O.D. FEE: PREPAID ☐ COLLECT ☐ $

TOTAL CHARGES $

FREIGHT CHARGES Check Appropriate Box ☐ Freight prepaid ☐ Collect

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of the issue of this Bill of Lading, the property described above in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated above, which said carrier ... agrees to carry to its usual place of delivery at said destination ... Uniform Domestic Straight Bill of Lading ...

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading ...

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation, according to the applicable regulations of the Department of Transportation.

SHIPPER USCG

PER [signature] Agent for

Permanent post office address of shipper

CARRIER Coal City Cob

PER [signature] DATE 5/11/10

† MARK WITH "X" TO DESIGNATE HAZARDOUS MATERIAL AS DEFINED IN TITLE 49 OF FEDERAL REGULATIONS.

For further details on SHIPPING HAZARDOUS MATERIALS see Federal Regulations 49 CFR, Part 172.

1

TOPS FORM No. 3843

Systech Environmental Corporation
1420 South Cement Road
Fredonia, KS 66736
Phone (800) 779-7224 Fax (620) 378-4505

Date 07/06/2010

Receiving Ticket No. 153722 * RAIL *

US Government/US Coast Guard
Dr. Dennis Mead
300 Ala Moana Blvd. # 8-134
Honolulu, HI 96850

(808)535-3464

EPA Id: USCGV

Transporter:
Name : BURLINGTON NORTHERN RAILROAD
Street: 176 E 5th St
Cty/St: Saint Paul , MN 55101
Phone : (800)419-2626
EPA Id: MND048342780

Manifest Number: 200260
State Manf No. :
Profile No: CG147574 Stand Prof:
P.O. Number : 385008
Release Number : 52310
Federal EPA Waste Codes:

Bill To: Name : NRC ENVIRONMENTAL SERVICES
Attn : Nikolas Heagy
Street: 1605 Ferry Point
Alameda , CA 94501
Cty/St:
Phone : (510)749 1390

Material Type : Bulk - RAIL
Waste Type : NHAZ
Date Received : 06/30/2010
Schedl Time In: 11:00
Actual Time In: 11:00
Date Check Out: 07/06/2010
Time Check Out:
Loading Time : 0 Hrs 0 Min
Haulr Rmp Time: 0 Hrs 0 Min
Unloading Time: 0 Hrs 0 Min
Rail Car No.: UTLX 200260
Waste Code Count: 0

Lab Analysis:		Btus/Lb:	19342	Mercury:	nd	Unloading/Processing Information:	
Sample #: 47102		Halogen:	<0.05%	Spec Grav:	0.71 *	Recv. Gross:	184,150
Anal. Dt: 06/16/2010		Water:	2.0%	* Grams per Milliliter		Recv. Tare:	59,950
Analyst: JN		Solids:	<5.0%			Recv. Net:	124,250
						Recv. Volume:	21,050
		Ph:	7.0				

Copy: 2

The analyses contained herein are performed solely for the purpose of qualifying the analyzed materials for acceptance by Systech in accordance with its permits and processing capability

Systech Environmental Corporation
1420 S. Cement Road
Fredonia, KS
6203784451

CERTIFICATE OF DESTRUCTION

This hereby certifies that waste as defined on Shipping document 200260 from US Government/US Coast Guard EPA ID: USGOV was received by Systech Environmental Corporation, RCRA permit ID: KSD980633259

The waste material was received on : 06/30/2010

Total pounds processed by Systech:* 124200

This waste is to be burned for energy recovery in a cement kiln in accordance with Federal (40 CFR 260 thru 270) and corresponding state hazardous waste regulations.

Treatment code for material processed: H061

Destruction commenced on or about the following date:** 07/09/2010

Carlotta Myers

John Mrkwa, Carlotta Myers
Customer Service Rep.

*** The date given above refers to when your waste shipment was introduced into the cement kiln for re-use as waste fuel.*

153722

Carrier No. 200260

Date

(Name of Carrier)

To: Consignee	FROM: Shipper U. [illegible]
Street	Street 300 [illegible]
Destination [illegible] Zip Code [illegible]	Origin Honolulu, HI Zip Code [illegible]
Route:	Vehicle Number
	Emergency Response Phone No.

No. Shipping Units	HM	Kind of Packaging, Description of Articles, Special Marks and Exceptions	Weight (Subject to Correction)	Rate	CHARGES (for Carrier use only)
	X	GASOLINE (LEADED)			
		HAZARDOUS CARGO			
		FLAMMABLE LIQUID			
		1993 UN1203 PG II			
		BARGE # CG 147574			
		+/- 21,000 GALLONS			
		UTLX 200260			
		Release # 51310			
		Rec'd 6/30/10			
		Systech / C Myers			

REMIT C.O.D. TO: ADDRESS

COD Amt $

C.O.D. FEE: PREPAID ☐ COLLECT ☐ $

TOTAL CHARGES $

FREIGHT CHARGES Check Appropriate Box: ☐ Freight prepaid ☐ Collect

(Signature of Consignor)

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of the issue of receipt by the carrier of the property described in the Original Bill of Lading, [illegible]

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

SHIPPER [illegible] CARRIER

PER [illegible] PER DATE

Permanent post office address of shipper

MARK WITH "X" TO DESIGNATE HAZARDOUS MATERIAL AS DEFINED IN TITLE 49 OF FEDERAL REGULATIONS

For further details on SHIPPING HAZARDOUS MATERIALS see Federal Regulations 49 CFR, Part 172

3

Systech Environmental Corporation
1420 South Cement Road
Fredonia, KS 66736
Phone (800) 779 4724 Fax (620) 378 4505

Date 07/06/2010

Receiving Ticket No. 153723 * RAIL *

US Government/US Coast Guard
Dr. Dennis Mead
300 Ala Moana Blvd. # 8-134
Honolulu, HI 96850

(808)535-3464

Bill To: Name : NRC ENVRIONMENTAL SERVICES
Attn : Nikolas Heagy
Street: 1605 Ferry Point
Alameda , CA 94501
Cty/St:
Phone : (510)749-1390

EPA Id: USGOV
Transporter:
Name : BURLINGTON NORTHERN RAILROAD
Street: 176 E 5th St
Cty/St: Saint Paul , MN 55101
Phone : (800)419-2626
EPA Id: MND048341788

Manifest Number: 200246
State Manf No. :
Profile No: CG147574 Stand Prof:
P.O. Number : 385008
Release Number : 51310
Federal EPA Waste Codes:

Material Type : Bulk - RAIL
Waste Type : NHAS
Date Received : 06/30/2010
Schedl Time In: 11:00
Actual Time In: 11:00
Date Check Out: 06/30/2010
Time Check Out:
Loading Time : 0 Hrs 0 Min
Haulr Pmp Time: 0 Hrs 0 Min
Unloading Time: 0 Hrs 0 Min
Rail Car No.: UTLX 200246
Waste Code Count: 0

Lab Analysis:
Sample #: 47101
Anal. Dt: 06/16/2010
Analyst: KS

Btus/Lb: 19423
Halogen: <0.05%
Water: 3.0%
Solids: <5.0%
Ph: 7.0

Mercury: ND
Spec Grav: 0.70 *
* Grams per Milliliter

Unloading/Processing Information:
Recv. Gross: 182,751
Recv. Tare: 60,300
Recv. Net: 122,451
Recv. Volume: 21,000

Copy: 1

Received By: ______________________ Date :____________

The analyses contained herein are performed solely for the purpose of qualifying the analyzed materials for acceptance by Systech in accordance with its permits and processing capability.

Systech Environmental Corporation
1420 S. Cement Road
Fredonia, KS
6203784451

CERTIFICATE OF DESTRUCTION

This hereby certifies that waste as defined on Shipping document 200246 from US Government/US Coast Guard EPA ID: USGOV was received by Systech Environmental Corporation, RCRA permit ID: KSD980633259

The waste material was received on : 06/30/2010

Total pounds processed by Systech:* 122451

This waste is to be burned for energy recovery in a cement kiln in accordance with Federal (40 CFR 260 thru 270) and corresponding state hazardous waste regulations.

Treatment code for material processed: H061

Destruction commenced on or about the following date:** 07/03/2010

Carlotta Myers

John Mrkwa, Carlotta Myers
Customer Service Rep.

*** The date given above refers to when your waste shipment was introduced into the cement kiln for re-use as waste fuel.*

(Name of Carrier)

TO:
Consignee
Street
Destination — Zip Code

FROM:
Shipper
Street
Origin — Zip Code
Vehicle Number

Route

No. Shipping Units	HM	Kind of Packaging, Description of Articles, Special Marks and Exceptions	Weight (Subject to Correction)	Rate	CHARGES
	X	Gasoline (Leaded)			
		Hazardous Cargo			
		Flammable Liquid			
		1993 UN1203 PG II			
		+/- 21,000 Gallons			
		UTLX 200246			
		Rec'd 6/30/10			
		Systech / C Myers			

REMIT C.O.D. TO:
ADDRESS

COD Amt $

C.O.D. FEE: PREPAID / COLLECT $

TOTAL CHARGES $

FREIGHT CHARGES
Check Appropriate Box:
☐ Freight prepaid ☐ Collect

SHIPPER USCG
PER
CARRIER
PER
DATE

MARK WITH "X" TO DESIGNATE HAZARDOUS MATERIAL AS DEFINED IN TITLE 49 OF FEDERAL REGULATIONS

For further details on SHIPPING HAZARDOUS MATERIALS see Federal Regulations 49 CFR, Part 172.

3

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number
2. Page 1 of
3. Emergency Response Phone
4. Manifest Tracking Number **006626866 JJK**

5. Generator's Name and Mailing Address
Generator's Site Address (if different than mailing address)
Generator's Phone:

6. Transporter 1 Company Name
U.S. EPA ID Number CA[illegible]

7. Transporter 2 Company Name
U.S. EPA ID Number

8. Designated Facility Name and Site Address
U.S. EPA ID Number
Facility's Phone:

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
	1.			3,500				010
	2. THIS WASTE STREAM HAS BEEN QUALIFIED FOR RECYCLING/TREATMENT AT THE							
	3. DeMENNO/KERDOON FACILITY IN COMPTON, CALIFORNIA. THIS FACILITY HAS THE NECESSARY ~~PERMITS TO RECEIVE YOUR WASTE STREAM AS~~							
	4. QUALIFIED. OUR EPA NUMBER IS CAT080013352							

14. Special Handling Instructions and Additional Information

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name | Signature | Month 5 Day 20 Year 10

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit: Date leaving U.S.:
Transporter signature (for exports only):

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name | Signature | Month 5 Day 25 Year 10
Transporter 2 Printed/Typed Name | Signature | Month Day Year

18. Discrepancy
18a. Discrepancy Indication Space ☑ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
414 with [illegible] Manifest Reference Number: 5/27/10
18b. Alternate Facility (or Generator) U.S. EPA ID Number
Facility's Phone:
18c. Signature of Alternate Facility (or Generator) Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. | 2. | 3. | 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name | Signature | Month 5 Day 27 Year 10

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete. **DESIGNATED FACILITY TO GENERATOR**

Certificate of Treatment/Recycling

ISSUED TO

U.S. COAST GUARD USS CHEHA

FOR

MANIFEST NUMBER 006626877JJK DATE RECEIVED 5/18/2010

The aqueous waste received on the above manifest will be treated to standards mandated by the FEDERAL CLEAN WATER ACT and to effluent requirements established by the Sanitation Districts of Los Angeles County. Waste treatment and recycling is performed under permits granted to DeMENNO/KERDOON, a California Corporation, by the California Department of Toxic Control (DTSC), in coordination with the Environmental Protection Agency, in accordance with the provisions of the Resource Conservation and Recovery Act (RCRA) of 1976, together with applicable federal and state regulations including but not limited to waste discharge requirements established by the Sanitation Districts of Los Angeles County.

When the above described waste material is accepted by DeMENNO/KERDOON and treated/recycled and the aqueous phase discharged for further treatment by the Sanitation Districts, the certificate holder's responsibility for the waste material is eliminated under both RCRA and Proposition 65. Upon request, DeMENNO/KERDOON will issue this certificate that all waste material has been handled in accordance with applicable permits and the certificate holder's liability has been terminated.

DeMENNO/KERDOON
"Compliance Through Recycling"

By: ____________ Date: 5/28/2010
Cyrus Pourfaesacian
Laboratory Manager

2000 North Alameda Street ☐ Compton ☐ California ☐ 90222
Telephone (310) 537-7100 ☐ Facsimile (310) 639-2946

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number: CAC002190102
2. Page 1 of	1
3. Emergency Response Phone	NRCES: 510-749-1390
4. Manifest Tracking Number	006626877 JJK

5. Generator's Name and Mailing Address: U. S. COAST GUARD - USS CHEHALIS, 300 ALA MOANA BLVD, HONOLULU HI 96850 — ATT: DENNIS MEAD

Generator's Site Address (if different than mailing address): U. S. COAST GUARD - USS CHEHALIS, 431 WRIGHT AVE, RICHMOND CA 94804

Generator's Phone: 808 535-3434

6. Transporter 1 Company Name: Marine express — U.S. EPA ID Number: CAL000126290

7. Transporter 2 Company Name: — U.S. EPA ID Number:

8. Designated Facility Name and Site Address: Demenno Kerdoon, 2000 N. Alameda St, Compton CA 90222 — U.S. EPA ID Number: CAD080013352

Facility's Phone: 310 537 7100

HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
X	1. UN1993, WASTE Flammable liquids, n.o.s. (OIL, GASOLINE, DIESEL, AVIATION FUEL AND SALT WATER)	001	TT	5,200	G	D001	D008	D018
						331		
	2.							
	3.							
	4.							

THIS WASTE STREAM HAS BEEN QUALIFIED FOR RECYCLING/TREATMENT AT THE DeMENNO/KERDOON FACILITY IN COMPTON, CALIFORNIA. THIS FACILITY HAS THE NECESSARY PERMITS TO RECEIVE YOUR WASTE STREAM AS QUALIFIED. OUR EPA NUMBER IS CAD080013352.

14. Special Handling Instructions and Additional Information: WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT ; JOB/PO# 48119 NRC ENVIRONMENTAL SERVICES INC (NRCES) 1605 FERRY POINT ALAMEDA, CA 94501

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: CDR A. Blossom, USCG (OE) — Signature: CDR A. Blossom (OE) USCG — Month 5 Day 17 Year 10

16. International Shipments: Import to U.S. / Export from U.S. — Port of entry/exit: — Date leaving U.S.:

Transporter signature (for exports only):

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: James Fitch — Signature — Month 5 Day 17 Year 10

Transporter 2 Printed/Typed Name — Signature — Month Day Year

18. Discrepancy

18a. Discrepancy Indication Space: [X] Quantity [ ] Type [ ] Residue [ ] Partial Rejection [ ] Full Rejection

Reconciled quantity 4018 with AK10 — Manifest Reference Number: NRC — 5/24/10

18b. Alternate Facility (or Generator) — U.S. EPA ID Number — OR

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1. H039 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name: Fernando Marquez — Signature — Month 05 Day 18 Year 10

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR

Certificate of Treatment/Recycling

ISSUED TO

U.S. COAST GUARD - USS CHEHA

FOR

MANIFEST NUMBER 006626877JJK DATE RECEIVED 5/18/2010

The aqueous waste received on the above manifest will be treated to standards mandated by the FEDERAL CLEAN WATER ACT and to effluent requirements established by the Sanitation Districts of Los Angeles County. Waste treatment and recycling is performed under permits granted to DeMENNO/KERDOON, a California Corporation, by the California Department of Toxic Control (DTSC), in coordination with the Environmental Protection Agency, in accordance with the provisions of the Resource Conservation and Recovery Act (RCRA) of 1976, together with applicable federal and state regulations including but not limited to waste discharge requirements established by the Sanitation Districts of Los Angeles County.

When the above described waste material is accepted by DeMENNO/KERDOON and treated/recycled and the aqueous phase discharged for further treatment by the Sanitation Districts, the certificate holder's responsibility for the waste material is eliminated under both RCRA and Proposition 65. Upon request, DeMENNO/KERDOON will issue this certificate that all waste material has been handled in accordance with applicable permits and the certificate holder's liability has been terminated.

DeMENNO/KERDOON
"Compliance Through Recycling"

By: ____________ Date: 5/28/2010

Cyrus Pourhassanian
Laboratory Manager

2000 North Alameda Street ☐ Compton ☐ California ☐ 90222
Telephone (310) 537-7100 ☐ Facsimile (310) 639-2946

WILDEN

A DOVER COMPANY

DECLARATION OF CONFORMITY

Page 1

Manufacturer:	Wilden Pump & Engineering, LLC
Address :	22069 Van Buren Street
	Grand Terrace, CA 92313-5607

The Wilden product listed conforms to the standards and directives described below.
Wilden Representative (Responsible Person): Gary K. Lent Position: V.P. of Engineering

Signature: [signature] Date: 1/11/10

Model Number:	02-13764
Serial Number:	0221059269
Description :	XPX8/AAAAA/BN8/BN/BN
Manufacturing no:	M479519

WP01 - The Wilden product listed conforms to the Machinery Directive 98/37/EC: Part 1 of Annex I and complies with the relevant requirements of EN ISO 12100-1: Safety of machinery.

CE

WP05 - The Wilden product listed conforms to the Equipment Explosive Atmospheres Directive (ATEX) 94/9/EC and complies with the relevant requirements of EN 1127-1: Explosive atmospheres and EN 13463-1: Non-electrical equipment for potentially explosive atmospheres. Wilden's [illegible] technical file (968/Ex-Ab 322/03) is retained by Notified Body: T [illegible] V Industries Service GmbH (ref-no: 0035), Am Grauen Stein, D-51105 K[illegible]ln
ATEX Rating: II 2 GD X

Ex

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SECTION II

FINAL REPORT
EX-USS *CHEHALIS* SURVEY
PAGO PAGO
AMERICAN SAMOA

27 February–30 December 2009

Prepared by:
GPC, A Joint Venture
P.O. Box JK
Williamsburg, VA 23187

Contract No.
N00024-07-D-4130

Delivery Order No.
0416

Sponsored by:
Naval Sea Systems Command
1333 Isaac Hull Avenue, SE (Mail Stop 1072)
Washington Navy Yard, DC 20376

9 September 2010

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TABLE OF CONTENTS

LIST OF APPENDICES

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SECTION A – EXECUTIVE SUMMARY

The purpose of this delivery order was to assist the US Navy's Supervisor of Salvage (SUPSALV) in conducting an underwater survey of the Ex-USS *Chehalis*, scuttled in 1949, in Pago Pago, American Samoa to determine the accessibility, type, and quantities of pumpable fuel that were remaining aboard the vessel.

Following the survey, a detailed analysis of offload and disposal options was developed, followed by an offload/fuel transfer plan that was to be implemented at a future date. Planning for the survey commenced with the research of existing documentation that included a review of the historical documents on file detailing the events surrounding the sinking of the vessel, previous surveys, and retrieval of class vessel drawings. From the historical documents and the ship's drawings, a detailed plan was developed to methodically examine the accessible cargo and bunker tanks for the remaining pumpable fuel. All dive related missions were tasked to the U.S. Navy Divers from Mobile and Diving Salvage Unit, MDSU 1, stationed in Honolulu, Hawaii. In addition to extensive coordination between the SUPSALV, ESSM, U.S. Coast Guard District 14, USCG *Sector Honolulu*, the USCG Pacific Strike Team, MDSU 1, NOAA, EPA Region 9, and local government authorities in American Samoa, a detailed operational and logistical support plan was organized and implemented. Support equipment was shipped from Cheatham Annex, Port Hueneme, California, and Honolulu, Hawaii. A support crane barge, which served as the dive platform, as well as onsite materials handling equipment, were contracted for with the MYD shipyard in Pago Pago, American Samoa.

Onsite operations commenced 24 April 2009, with the pier side outfitting of the barge and simultaneous marking of the wreck by the MDSU divers. The barge was moored over the Ex-*Chehalis* on 26 April, and dive operations commenced on 27 April. As detailed in the survey plan, the forward port and starboard lube oil tanks, A-2 and A-3, were surveyed first. This was accomplished by drilling holes in the side of the tanks starting from the high point first. Since fuel was not found at the high points, it was determined that these two tanks were empty. Dive operations proceeded to the port aft main fuel service and fuel storage oil tanks. The high points in the tank were drilled, and an estimated 1,500 gallons of diesel fuel was found in the fuel oil storage tank, C902F. Fuel storage tank C304F was drilled, and no oil was found. The starboard fuel oil storage tank, C901F, was drilled, and no oil was found. Starboard tank C305F was not accessible for sampling as it was buried in the mud and was not accessible through the shell plate. Fuel oil tank 905F was confirmed to have approximately 6,000 gallons of diesel fuel as noted in a previous survey. Tank C906 was sampled without finding oil. Initial detection of fuel in a cargo hold was accomplished using a fuel paste impregnate line floated to the top of the tank to determine the level of fuel in the tank. Using this method, an estimated 27,000 gallons of fuel was found in cargo tank B-8, and an estimated 38,000 gallons of fuel was found in tank B-10. Using the same sampling procedure, the remainder of the cargo holds did not contain fuel beyond insignificant residual levels. Obtaining samples of the fuel for chemical analysis in B-8 and B-10 was accomplished by divers entering the tanks through the Rolling Water Tight Hatches (RWTH) with a sampling suction hose/float assembly that was buoyant and floated to the high point in the tank. The second diver remained just outside the RWTH hatch, with a hand-operated suction pump attached to the suction hose/float assembly. The sample was extracted by first evacuating sea water from the hose using a reviously determined pump stoke count followed by pumping into the sample jar or can, which was held upside down and evacuated with the diver's pneumo. The diver pumped the sample can full of the fuel, capped the can, and brought it to the surface. The same exploration technique was used on the portside tanks through the RWTH hatches at B-5-through B-9. B1 and B3 were accessible through an opening in the hull caused by the initial sinking. No fuel was found in the portside cargo holds.

In summary, approximately 27,000 gallons of pumpable gasoline was found in B-8 and an additional 38,000 gallons in B-10. In addition, C905 and C902F contained 6,000 and 1,500 gallons of diesel fuel respectively.

Upon conclusion of the dive operations, the fuel samples were taken to the BP fuel lab in Pago Pago for initial analysis. There it was concluded that cargo holds B-8 and B-10 contained gasoline, and C905 and C902F contained diesel fuel oil. The samples for B-8 and B-10 were then sent to Australia for in-depth analysis. There it was determined that B-10 contained high lead/high octane 115/145 aviation fuel and that B-8 contained a blended mixture of high lead motor gasoline and aviation gasoline. A copy of the gasoline fuel analysis is attached in Appendix C.

A series of alternate plans were developed to offload and dispose of the remaining fuel aboard the Ex-*Chehalis* following onsite operations. These alternatives were summarized in a matrix format with associated estimated costs and presented to the USCG District 14 Commander for discussion. A copy of the initial offload and disposal option alternatives is attached in Appendix D. Early in the offload/disposal decision process, it was determined that the use of Navy divers and support assets would be employed in combination with commercial classed vessels to conduct the offload. Regarding the disposal of the fuel after offload, a series of discussions ensued where it was decided that the recovered fuel would need to be sent to either a certified waste recycling facility in Singapore or to the West Coast of the United States where it would be incinerated or reutilized. These decisions led to the issue of an amendment to the Ex-*Chehalis* (AOG-48) Gasoline Offloading and Disposal Options found in Appendix E. Initial cost analysis identified Singapore as the most favorable option. While a certified recycler was identified in Singapore, they were unable to accept the hazardous waste due to Singapore being a signatory to the Basel Agreement, and the United States not being a signatory. Under the governing conditions of the Basel Agreement, signatories are not permitted to accept hazardous waste from non-signatory nations. Subsequent to the Singapore refusal to allow entry, it was formally determined by the United States EPA that the aviation fuel could be processed as a hazardous material as opposed to a hazardous waste if the fuel was destined for an EPA approved recycle or energy use facility. The refusal for entry into Singapore by the Singapore National Environment Agency drove the final course of action for the disposal of the fuel, the West Coast option of barge transport through the San Francisco port facilities, and subsequent on-carriage via rail to the EPA approved Systech recycling facility in Fredonia, Kansas.

The final operational concept developed utilizes the MDSU 1 divers, a Navy T-ATF supported by technical assistance, and logistical support from GPC using a chartered certificated barge/tug to offload and transport the recovered product to the U.S. West Coast. The recovered fuel will subsequently be transferred by rail to the EPA approved Systech facility in Fredonia, Kansas.

The objectives successfully accomplished during this operation are as follows:

1. Safe conduct of all Ex-*Chehalis* survey operations with no reportable injuries.
2. Detailed planning of the survey and logistic resources to support the survey.
3. Conduct of the survey, identifying potentially recoverable fuel.
4. Development of several courses of action, and associated costs to offload and dispose of the high octane/high lead gasoline and diesel aboard the Ex-*Chehalis*.
5. Refinement of the presented alternatives into an actionable offload and disposal plan that was approved by the USCG District 14 Command for implementation.
6. Development of a Fuel Transfer Plan.
7. Development of a Site Safety Plan.

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SECTION B – CHRONOLOGY OF EVENTS

March 2009

GPC researched historical data and vessel class plans on the Ex-*Chehalis*.

A 3-D model of the vessel was developed with emphasis on the tanks and cargo holds to be explored.

The tools and logistical support were assembled to sustain the tasking.

GPC coordinated with the US Navy SUPSALV, MDSU 1, USCG, EPA, NOAA and the Government of Samoa agencies to develop the survey plan and logistics support.

An onsite visit to Pago Pago, American Samoa, was made to coordinate logistics support.

GPC subcontracted to MYD Shipyard for a support platform (Barge *Derrick*).

A detailed barge layout and mooring plan were developed and e-mailed to MYD Shipyard.

MDSU 1 containers departed Hawaii for Long Beach, California, then to Samoa.

April 2009

Shipments departed Cheatham Annex for Long Beach en route to American Samoa.

Shipments departed Port Hueneme for American Samoa.

20 April

Shipments arrived in Pago Pago.

24 April

Personnel arrived in Pago Pago. Containers were delivered to MYD shipyard.

25 April

Outfitting of MYD ex-Barge *Derrick* (crane barge) commences. MYD MHE support was marginal. Anchor systems for the moor are not as specified and need revamping. Outfitting of the barge for dive operations continued. The MDSU security personnel team is stationed onboard the barge for the night.

26 April

Barge and mooring preparations continue. The small boat marks anchor positions over the Ex-*Chehalis* with strawberry buoys. The mooring evolution takes most of the afternoon with two Samoan tugs providing the propulsion. Language barriers hindered coordination efforts. The barge was well positioned to accomplish the survey. MDSU charged with providing night security watch throughout the survey.

27 April

Preparations for the first dive operations began. The mini Remotely Operated Vehicle (ROV) arrives and is used to investigate access to Lube Oil Tanks A-2 and A-3. The mini ROV provided verification that the watertight doors into the tank area were wide open before the first dive into that area. Near what would be the high point of tank A-2, holes were drilled, but no oil was found. Metal plugs were used to plug the holes. Next, divers entered the cofferdam area and descended to Lube Oil Tank A-3, drilled at the high spot and did not find oil. With the exception of silt in the area, both tanks were readily accessible.

28 April

Lube Oil Tank A-2 was drilled lower and another sample was taken. No oil was found. During this evolution, the problems with the drill became evident; the drill would not turn off when the trigger was released. Divers validated the position of the drilling in A-3 to confirm we were in the correct tank. Port tank 304F was located and drilled in two spots, one two feet above the other. No oil was found. When drilling took place at depths below 40-50 feet, the drill would not turn off. C902F was located and drilled; oil was found. It was estimated that approximately 1,500 gallons of oil were present based on the height of the tank above the oil's location. The hole was plugged with a metal plug.

29 April

Dives today concentrated on locating the lost hole in C304F which was not found. Theory is that the temporary wood plug broke off flush with the hull. Since oil was not found in the tank, the decision was made that it did not present a threat.

Personnel were visited by the Governor of American Samoa taking up most of the afternoon. The Governor was interested in the operation and offered his full support for the project.

30 April

The existing plugs in the storage tanks were sealed with epoxy. A second hole was drilled lower in C902F, and no oil was found at that level, confirming the initial estimate of 1,500 gallons in C902F. Drilled starboard C305F from the bottom shell plate, and no oil was found. Sealing the plugs continued. Personnel measured the attitude of the ship and determined it was down by the stern approximately 4 degrees. Athwart ships she is at zero degrees. Extensive ROV surveys of the ship were conducted.

1 May

Divers drilled C905 and located oil, a sample taken confirmed approximately 6,000 gallons as did the previous survey. Previous survey holes and plugs were easily located. Drilling on tank C906 would commence the next day.

2 May

C906 was drilled, and no oil was found. Cargo holds were sampled, and samples were taken from B-10 first.

3 May

Corrections to the labeling on previously labeled tanks were made, and the remaining tanks were labeled. Tank labeling eliminates misidentification of the area being worked. Samples were pulled from tanks B-6 and B-8. No fuel was found in B-6; however, fuel was found in B-8. The sample jar was filled and returned to the surface. After sampling B-6 a second time and no fuel observed, a diver entered B-6 and swam toward the top and again no fuel was found. This concluded that B-6 was empty. B-4 was sampled, and no fuel was found. Divers again swam to the top, could not find fuel, and concluded that B-4 does not have fuel.

4 May

Cargo tanks B-8 and B-10 were gauged with fuel paste on a line. Conducted entry into tanks B-5, B-9, and B-7, and no fuel was found in these tanks. Placed epoxy on the drilled hole/plug in cargo tank C905.

5 May

Cargo hatches B-1 and B-3 were labeled on the down side of the hull. It was noted that cargo hatch B-3 is closed tightly but that entry can be gained through the gaping hole caused by the explosion in B-1/B-2 area. Since the results of our findings in B-6 differed significantly with those found on the previous Associated Underwater Services (AUS) survey, the decision was made to extract another sample from B-6. Tank B-6 was re-sampled after ascertaining that the cargo holds were labeled properly, and no fuel was found.

6 May

Divers entered B-1 and B-3 to determine fuel levels. B-1 was declared free of fuel, and B-3 contained an insignificant trace of residual fuel/water mixture.

7 May

Divers verified that none of the other plugs were leaking, and double sealed tank C905 with a cap and epoxy. Divers attempted to close the B-1 hatch but could not due to damaged hinges. Only two dives conducted as a squall came through at 1345 and dislodged the barge from over the wreck when the southwest anchor lost its hold and slid down the steep bottom slope. Dive operations concluded, and the barge was towed back to the container pier.

8 May

Barge *Derrick* moved to the MYD shipyard and demobilization started. Containers removed from the barge were placed pier side. All equipment removed was cleaned then stowed for the return shipment.

9 May

GPC continued sealing containers and preparing shipping documents for return shipments. An operational after action meeting was conducted to capture significant considerations that may be applicable to the anticipated offload operation.

10 May

Personnel departed American Samoa for return to their home bases.

1-15 June

Shipments returned to home bases after clearing customs in Long Beach, California. MDSU containers diverted to San Diego in support of a downed aircraft mission.

15 June-15 July

Preventive maintenance was completed on returning equipment. The Offload and Disposal Plan was developed in conjunction with SUPSALV, NOAA, and the USCG. The initial plan was completed 14 July 2010.

10 July-11 August

Discussions regarding the options presented in the Offload and Disposal Plan continued.

11 August-13 August

The decision to go forward with "State of Cleanliness Condition1" and the offload option of Military Divers/Commercial certified vessels as the primary offload option was finalized with all concerned persons. Regarding disposal options, on water evaporation was deleted, and "Thermal Oxidation" and transport to a processing facility for reutilization or incineration, were to be considered as the best approach and explored in more detail.

16 August-October

Offload and disposal options were further developed and discussed more in depth. Thermal oxidation on site was ruled out due to cost and operational concerns. With burn rates in the range of 4 to 5 gallons per minute, coupled with the storage and feed requirements as well as the extended operational window, thermal oxidation was not feasible. Shipment to a recycling facility was further developed on two fronts, shipment to Singapore and shipment to the U.S. West Coast. Cost analysis favored Singapore slightly, and that option was developed in more detail.

15 October-30 November

The disposal option via Singapore encountered problems as it was determined that Singapore was a signatory to the Basel Agreement and could not accept hazardous waste from a non-signatory nation, the United States. Disposal options were now down to one viable option: processing the fuel through a West Coast port and send to an EPA approved incineration facility located in CONUS. In a 19 November e-mail from the EPA, the determination was issued that the Ex-*Chehalis'* fuel was not to be considered a hazardous waste if the fuel was going for reclamation or used as a fuel. This determination opened the window to explore options other than incineration in an EPA approved hazardous waste facility.

1-30 December

With the EPA's determination issued regarding the classification of the recovered product as a dangerous cargo if the product was used as a fuel, alternate disposal options opened up with the added benefit that the product no longer had to be treated and documented as a hazardous waste. Systech, an EPA approved facility in Fredonia, Kansas, was identified as the best disposal facility. This EPA approved facility uses off-specification fuel and waste in the production of cement. This course of action was determined to be cost neutral when compared to the hazardous waste incineration at the Utah facility with the added benefit that the entire project would proceed as a dangerous cargo shipment, not a hazardous waste shipment. As a result of this decision, the Fuel Transfer Plan and a Safety Plan were developed in final form. These documents are attached as enclosures (Appendix F and G).

22 December

A separate verbal delivery order was received to proceed with the offload of the Ex-*Chehalis* using military divers, a T-ATF, and a commercial support/transport platform. Disposal of the Ex- *Chehalis'* fuel was to be accomplished through the Systech facility in Fredonia, Kansas. The operation was scheduled to begin in late March/April 2010.

SECTION C – PROBLEMS ENCOUNTERED

There were no insurmountable equipment problems. All equipment functioned as designed.

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SECTION D – LESSONS LEARNED AND RECOMMENDATIONS

Lesson Learned:	The MYD Shipyard in Pago Pago, while the only option for local barge/mooring support, was minimally equipped and staffed to accomplish the job. Despite one onsite visit and numerous e-mails, the yard did not prepare for the operation as directed. The barge/crane served the purpose. The assembly of the mooring system was deficient as was the planning for moving into the moor. Requested logistical support was slow in materializing, and MHE support was equally marginal.
Recommendation:	With all of the above deficiencies in the subcontracted MYD aspect of the operation, the mission was accomplished primarily due to the hard work of the MDSU divers, USCG personnel, NAVSEA, and the ESSM crew. In retrospect, a couple visits from onsite representatives for a week or so before the operation may have improved the MYD performance marginally. The underlying problem is that resources on the island do not support an operation of this nature well due to the lack of local salvage equipment and expertise. For the offload of the Ex-*Chehalis,* more self-sufficiency in deploying forces' assets is required.
Lesson Learned:	Delivery of the container shipments from the container pier to the MYD shipyard was not as smooth as it could be. While the shipments were booked “door to door”, the stateside booking agent failed to communicate with the delivering agent in Samoa. While the lack of communications caused some bureaucratic headaches, there were no resulting delays in the operation.
Recommendation:	A person on the ground a few days before the operation would have facilitated the delivery of the containers as planned overcoming the bureaucratic hurdles ahead of the advance party.
Lesson Learned:	All of the cargo hatches look about the same, and when combined with limited visibility at a depth of 100 + feet, it is easy to get confused as to which hatch the diver is approaching to accomplish the work assignment. On several occasions, the divers were unsure about where they were on the ship.
Recommendation:	Take the time early in the operation to label critical points on the vessel to avoid confusion during the operation. When critical points are known, make labels in advance, and apply during the initial dives.

LESSONS LEARNED AND RECOMMENDATIONS (Cont.)

Lesson Learned:	ROV support provided much information regarding access to the interior of the vessel before making the dives. For example, entry into the forward house for access to the lube oil tanks was thought to require opening several hatches. By swimming the ROV in the vicinity and into the hatch, it was determined that the area was readily accessible and that the first diver should go directly to the lube oil tank and drill. As a result, it is an operational timesaver because sufficient information was available to properly outfit the divers for the anticipated work.
Recommendation:	Incorporate small ROVs into the operation to improve operational efficiency and safety.
Lesson Learned:	Fire coral inside the Ex-*Chehalis* tanks caused severe skin burns on the divers.
Recommendation:	Ensure that adequate protective clothing is worn by the divers, especially when entering the tanks.
Lesson Learned:	The Stanley DL and drills found in the Lightweight Hot Tap Kits would not shut off at depths below 40 to 50 feet. They are also not on the Approved for Navy Use (ANU) list for use although a waiver had been submitted.
Recommendation:	Discuss with Stanley Tools regarding a fix. Discuss with NAVSEA regarding testing for ANU approval. Since the DL 9 drills function properly at depth, use DL 9 drills until the DL 7's can be corrected.
Lesson Learned:	The stainless steel tapered “boiler repair” plug used for sealing the holes drilled in the hull were not easy to use or leak proof. They needed to be sealed with epoxy to have any degree of confidence they would not leak.
Recommendation:	Go back to the use of quality self tapping bolts to seal the drilled holes. The drill/bolt size must be a matched combination.

SECTION E – EQUIPMENT UTILIZED

System Number	System Nomenclature	ESSM Number	ESSM Nomenclature	Quantity
Support Equipment				
P17200	2″-6″ POL Pumping System	HT0006	Hot Tap Lightweight	2
S7100	Capstan	CP2079	Capstan, 18″ Portable	2
P02100	Tanker Boarding Kit	AL0200	Alarm, Personnel Passport	1
P17200	2″-6″ POL Pumping System	KT0050	Drill press Hyd, Underwater	1
		KT0450	Max Beam Searchlight	1
		UW2010	Cabinet Divers Tool	1
Oil Transfer Systems				
P17200	2″-6″ POL Pumping Systems	PU0300	Peristaltic Pump	2
		PU0830	Pump Submersible 2″ Hyd	1
		PU2103	Pump Diaphragm.1″	1
		PU2105	Pump Diaphragm 2′	1
P17200	2″-6″ POL Pumping System	PW0020	Power Unit. Hyd Mod 9	2
Field Support Systems				
P19600	Shop Van	VA0010		1
N/A		VA1987	Van, Support Task Special	1
P19700	Rigging Van	VA0508		1
Communications Systems				
NA	None	RA1728	Radio, VHF, Marine Hand-Held IC M88	6
		RA1831	Radio, VHF	1
MDSU Dive Systems				
NA	None	NA	Standard Navy Double-Lock Recompression Chamber	1
NA	None	NA	Support Containers	2

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SECTION F – EQUIPMENT EVALUATION

BV0010:	The Stanley DL07 hydraulic drills malfunctioned at depth. Once activated, they would not turn off at depths below 40 to 50 feet.
Recommendation:	Drills were sent back to the manufacturer for evaluation and repair. The manufacturer subsequently retrofitted selected serial numbers of the ESSM inventory of drills with new spool kits. Early indications are that this may have only partially solved the problem. Older DL 9 drills do not seem to have the problem and will be used for the off load.

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APPENDIX A – PERSONNEL

The following personnel participated in the on-site operations:

NAVSEA Representative:	Kemp Skudin – NAVSEA, 00C25 (202) 781-2602
USCG Pacific Strike Team:	Commander Day 3 Personnel
MDSU 1:	Chief Warrant Officer Lehener (757) 739-2136 16 Divers
SWRMC:	Two ROV Operators
GPC Personnel:	
Project Coordinator:	Ron Worthington (757) 637-9004 Cell Phone: (703) 209-8872
Engineering:	Jeff Cane Craig Moffatt
Dive Support:	Paul Schadow
Mechanics:	Billy Eubanks David Vore

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APPENDIX B – PHOTOGRAPHS

Figure 1. Daily Operations Briefing

Figure 2. Set up Operations Aboard Support Barge Derrick

Figure 3. USCG Personnel Assembling Support Equipment

Figure 4. USN Personnel Assembling Support Boat

Figure 5. Diver Preparing Barge Deck for Davit Installation

Figure 6. Divers Discussing Upcoming Dive Operations
with SUPSALV and ESSM Personnel

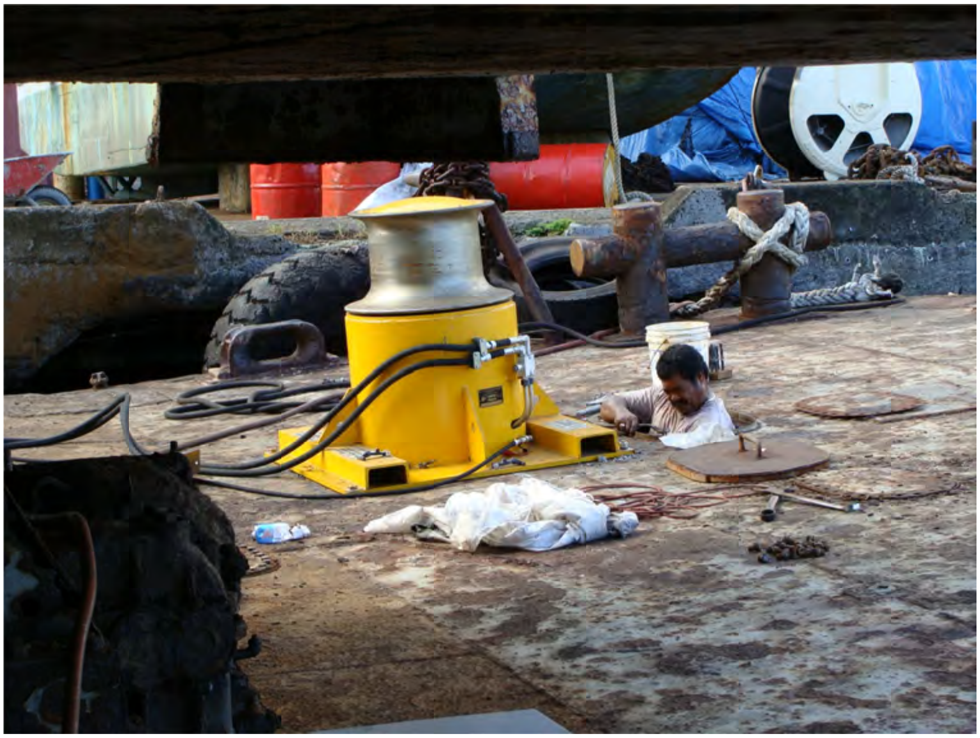

Figure 7. Installation of the ESSM Capstan Aboard the Barge *Derrick*

Figure 8. Completing Assembly of ESSM Support Equipment Aboard the Barge *Derrick*

Figure 9. Completing the Set up of the Dive Station on the Barge *Derrick*

Figure 10. Preparing Mooring and Anchor Lines
for Securing the Barge over the Ex-USS *Chehalis*

Figure 11. ASG Tug TATOSOO Assisting in Mooring the Barge *Derrick* Over the Ex-USS *Chehalis*

Figure 12. Ex 1954 Army Barge *Derrick* on Station as the Dive Platform

Figure 13. Helpful Eyes Above Guiding the Diver to the Assigned Task 120 feet Below

Figure 14. Preparing for the First Dive Operation

Figure 15. ROV Operations Center Weathering an Afternoon Storm

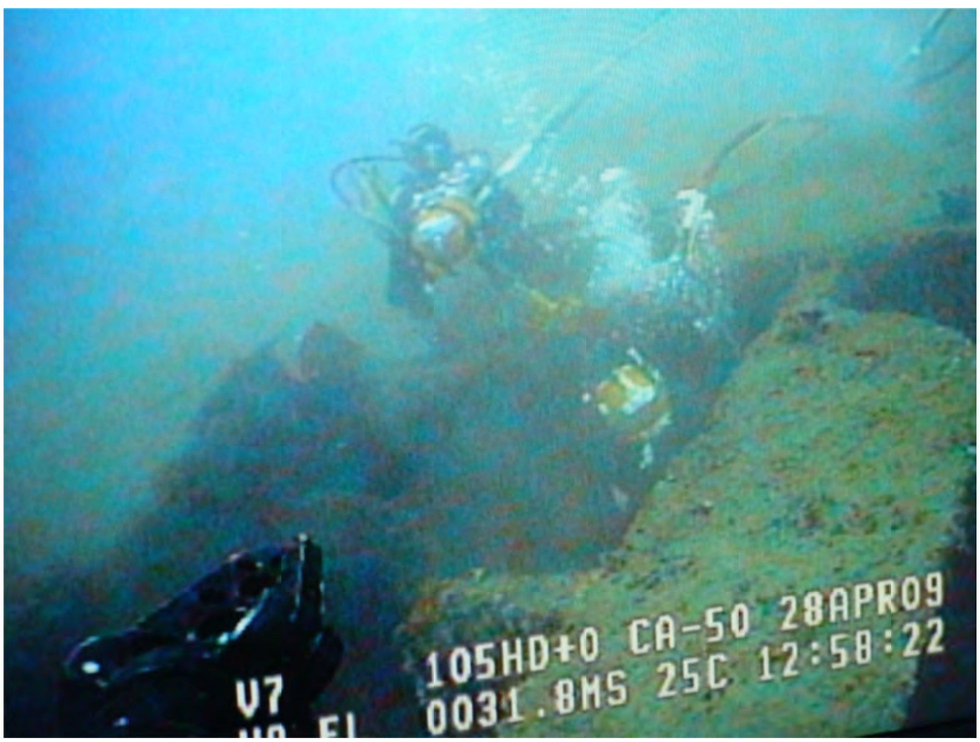

Figure 16. View of a Diver Entering the Hull Structure as Seen by the ROV

Figure 17. Tending the Divers Stage Line on an ESSM Capstan

Figure 18. Divers Preparing for Descent to the Ex-USS *Chehalis*

Figure 19. Red Diver Entering the Water

Figure 20. Green Diver Enters the Water

Figure 21. Ex-USS *Chehalis* Computer Generated Hull Graphics

Figure 22. Governor of Samoa, SUPSALV Representative,
and USCG Incident Commander

Figure 23. Governor of American Samoa with the SUPSALV/GPC Survey Team

Figure 24. Chehalis Survey Team with the Governor of American Samoa

APPENDIX C – FUEL SAMPLES FROM SURVEY

INDEPENDENT PETROLEUM LABORATORY LTD

Specialists in Fuels and Environmental Analysis

BP Avgas Test Report / Batch Certificate

"Your Testing Partner"

Location	Pago Pago	After Ship	Chehalis
Tank Number	B-8	Voyage Number	Unknown
Customer Reference		Supplier	Unknown
Batch Number	Unknown	Date Drawn	03-May-09
		Date for Retest	Not Applicable
Quantity in Tank :- (litres)		Before	
		After	

Method	Properties	Units	324650 / Unknown	Notes	Maximum Difference	Spec Limits
	Report Number / COQ Numbers		324650	Notes	Maximum	Spec
	Batch Number		Unknown		Difference	Limits
D4052	Density @ 15°C	kg/L	0.7418		0.003	
D86A	Initial Boiling Point	°C	32.5	(2)	6	
	10% Volume Evaporated @	°C	64.2		4	max 75
	40% Volume Evaporated @	°C	109.1		5	min 75
	50% Volume Evaporated @	°C	118.8		6	max 105
	90% Volume Evaporated @	°C	176.7		6	max 135
	Final Boiling Point	°C	202.8		10	max 170
	Recovered	%vol	97.5		-	min 97
	Residue	%vol	1.0		-	max 1.5
	Loss	%vol	1.2		-	max 1.5
	10% Evap Temp + 50% Evap Temp	°C	183.0		10	min 135
D5191	DVPE	kPa	54.5		4.5	38 - 49
D4176	Appearance @ Ambient Temperature	-	Clear and Bright	(1)	-	Clear and Bright
Visual	Colour	-	Pale Yellow	(1)	-	Green
D130	Copper Strip @100°C	-	1a		-	max 1
D1094	Change in Water Volume	mL	0.0		-	-2 - 2
	Interface Condition	-	1b		-	
D381	Existent Gum	mg/100mL	5		3	max 3
IP270	Lead	g/L	0.343		0.05	max 0.85

Certified that this sample has been tested as received in accordance with current editions of ASTM and IP methods and FAILS to MEET the requirements of Specification DEF STAN 91-90, Issue 2, (DERD 2485), with respect to the results given above.

This report shall not be reproduced either in part or whole without written approval of this Laboratory.

Notes:

(1) Not IANZ Accredited

(2) Results have been corrected for barometric pressure.

Authorised Signature: [signature] Name: [signature] Date: 23/05/09

laboratory

Independent Petroleum Laboratory Ltd (IPL) PO Box 3, Ruakaka, Northland, NEW ZEALAND

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ENCLOSURE (1)

INDEPENDENT PETROLEUM LABORATORY LTD

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BP Avgas Test Report / Batch Certificate

iPL "Your Testing Partner"

Location	Pago Pago	After Ship	Chehalis
Tank Number	B-10	Voyage Number	Unknown
Customer Reference		Supplier	Unknown
Batch Number	Unknown	Date Drawn	02-May-09
		Date for Retest	Not Applicable
Quantity in Tank :- (litres)		Before	0
		After	

Method	Properties	Units	Report Number / COQ Numbers 324581 / Batch Number Unknown	Notes	Maximum Difference	Spec Limits
D4052	Density @ 15°C	kg/L	0.7022		0.003	
D86A	Initial Boiling Point	°C	37.7	(2)	8	
	10% Volume Evaporated @	°C	73.2		4	max 75
	40% Volume Evaporated @	°C	98.5		6	min 75
	50% Volume Evaporated @	°C	100.2		6	max 105
	90% Volume Evaporated @	°C	117.9		8	max 135
	Final Boiling Point	°C	166.1		10	max 170
	Recovered	%vol	98.5		-	min 97
	Residue	%vol	1.0		-	max 1.5
	Loss	%vol	0.5		-	max 1.5
	10% Evap Temp + 50% Evap Temp	°C	173.4		10	min 135
D5191	DVPE	kPa	41.7		4.5	38 - 49
D4176	Appearance @ Ambient Temperature	-	Clear and Bright	(1)	-	Clear and Bright
D130	Copper Strip @100°C	-	1a		-	max 1
D1094	Change in Water Volume	mL	0.0		-	-2 - 2
	Interface Condition	-	1b		-	
D381	Existent Gum	mg/100mL	2		3	max 3
IP270	Lead	g/L	1.292		0.05	max 0.85
Visual	Colour	-	Pale Yellow	(1)	-	Green

Certified that this sample has been tested as received in accordance with current editions of ASTM and IP methods and FAILS to MEET the requirements of Specification DEF STAN 91-90, Issue 2, (DERD 2485), with respect to the results given above.

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Authorised Signature: G. Bradbury Name: GRAHAM BRADBURY Date: 25/05/09

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SAMPLES FROM PAGO - BP Conducted tests

~~SHIP CARGO ACCEPTANCE TESTS~~

VESSEL: CHEHALIS CARGO: GASOLINE + ADF

	PORT	INT	CENTRE	INT	STARBOARD	INT
GASOLINE API RANGE 55-60	PRODUCT: GASOLINE TANK: B-10 DENSITY: 0.7027 API: 69.9 TEMP. 70.5 DENSITY @ 15 71.5 FLASH POINT: HR/COL: CU:	B 10	PRODUCT: WATER (MOGAS TK) TANK: B6-CARGO TK DENSITY: API: (*) TEMP. 82.0 DENSITY@15 FLASH POINT: HR/COL: CU:	B 6	PRODUCT: TANK: DENSITY: API: TEMP. DENSITY@15 FLASH POINT: HR/COL: CU:	
JET/KERO API RANGE 15-50	PRODUCT: GASOLINE TANK: B-8 DENSITY: 0.7417 API: 69.2 TEMP. ~~60.5~~ 70 DENSITY @ 15 60.5 FLASH POINT: HR/COL: CU:	B 8	PRODUCT: TANK: DENSITY: API: TEMP. DENSITY@15 FLASH POINT: HR/COL: CU:		PRODUCT: TANK: DENSITY: API: TEMP. DENSITY@15 FLASH POINT: HR/COL: CU:	
DSL API RANGE 30-45 API	PRODUCT: DSL TANK: C905-F DENSITY: 0.8418 API: 36.5 TEMP. 73° DENSITY @ 15 37.7 FLASH POINT: [illegible] HR/COL: CU: [illegible]	905	PRODUCT: TANK: DENSITY: API: TEMP. DENSITY@15 FLASH POINT: HR/COL: CU:		PRODUCT: TANK: DENSITY: API: TEMP. DENSITY@15 FLASH POINT: HR/COL: CU:	
FLASH POINT MINIMUM 8°C - KERO/JET 0°F 2°C - HEATING OIL/DSL 3.6°F	PRODUCT: DSL TANK: C-902 DENSITY: 0.8556 API: 33.9 TEMP. 75 DENSITY @ 15 34.9 FLASH POINT: [illegible] HR/COL: CU: [illegible]	902	PRODUCT: TANK: DENSITY: API: TEMP. DENSITY@15 FLASH POINT: HR/COL: CU:		PRODUCT: TANK: DENSITY: API: TEMP. DENSITY@15 FLASH POINT: HR/COL: CU:	
	PRODUCT: TANK: DENSITY: API: TEMP. DENSITY @ 15 FLASH POINT: HR/COL: CU:		PRODUCT: TANK: DENSITY: API: TEMP. DENSITY@15 FLASH POINT: HR/COL: CU:		PRODUCT: TANK: DENSITY: API: TEMP. DENSITY@15 FLASH POINT: HR/COL: CU:	

VERIFIED BY SHORE OFFICER: NA DATE: 5-6-09

(*) No equipment for product with API < 29. - MORE WATER THAN FUEL

APPENDIX D – EX-USS *CHEHALIS* (AOG-48) GASOLINE OFFLOAD AND DISPOSAL OPTIONS

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EX-USS *CHEHALIS* (AOG 48)
GASOLINE OFFLOADING and DISPOSAL OPTIONS
PAGO PAGO, AMERICAN SAMOA

TBD – TBD Month 2009

Prepared by:
GPC, A Joint Venture
P.O. Box JK
Williamsburg, VA 23187

Contract No.
N00024-07-D-4130

Delivery Order No.
0021

Sponsored by:
Naval Sea Systems Command
1333 Isaac Hull Avenue, SE (Mail Stop 1072)
Washington Navy Yard, DC 20376

10 July 2009

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1.0 PURPOSE

The purpose of this report is to provide a concept of operations and available options for the safe offloading and disposal of the remaining 65,000 gallons of gasoline and 7,500 gallons of diesel fuel contained in the sunken Ex-*Chehalis* in Pago Pago Harbor, American Samoa. A survey was conducted in April/May 2009, a joint effort between the United States Coast Guard (USCG), Mobile Diving and Salvage Unit (MDSU) 1, and the U.S. Navy Supervisor of Salvage (SUPSALV). That survey determined that cargo tank B-10 contains approximately 37,000 gallons of aviation fuel and cargo tank B-8 contains approximately 28,000 gallons of a mixture of aviation and motor fuel. The ship's service tank C905 and fuel service tank C902F contain 6,000 and 1,500 gallons of diesel fuel respectfully. In addition, a small amount of residual fuel is contained in the high points, between the frames of each of the cargo holds, B-2 through B-7 and B-9.

2.0 GOALS AND OBJECTIVES

The goals of this report are the following:

a. To develop options to safely conduct an offload of the Ex-*Chehalis*' remaining petroleum products while respecting the Ex-*Chehalis* as a grave site.
b. To develop options and recommendations for a safe, and environmentally acceptable, disposition of the recovered products.
c. To identify the equipment, logistical support, and waterborne platforms necessary to conduct the offload and disposal options.
d. To identify the procedures and equipment necessary to minimize spills and environmental impacts during the offload and disposal operations.
e. To develop rough order of magnitude (ROM) cost estimates for the most feasible offload and disposal scenarios available.

3.0 BACKGROUND

The Ex-*Chehalis* (AOG 48) is a World War II, U.S. Navy tanker that sunk in 1949 in the Pago Pago Harbor, American Samoa. The vessel rests on its starboard side in approximately 160 feet of water in position 14 16′31″S, 170 40′56″W. Gasoline and oil have been reported to be leaking from the wreck into the harbor over the ensuing 60 years. During a period from 2005 through 2008, the American Samoa Environmental Protection Agency (EPA), strongly supported by Region 9 of the United States EPA, conducted research and surveys of the Ex-*Chehalis* which concluded that aviation fuel, 115/145, and high octane motor gasoline, and diesel fuel oils remained onboard. In early 2009, the Commander of the USCG *Sector Honolulu* requested the U.S. Navy to survey the Ex-*Chehalis*. This survey was funded by the National Pollution Funds Center. The Naval Sea Systems Command's (NAVSEA) Supervisor of Salvage (SUPSALV) tasked GPC, a Joint Venture, their Emergency Ship Salvage Material (ESSM) operations contractor, to develop a plan to survey the vessel to fully determine the quantities and accessibility of the petroleum products that remain onboard. The ensuing plan utilized MSDU 1

(Hawaii) as the primary source of divers and operational control of the Navy assets used to conduct the operation. The primary emphasis of that mission was to examine the tanks that were not explored during the previous surveys, selectively confirm the results of the previous surveys, and to develop operational concepts for removal and disposal of the pumpable petroleum products in a follow-on operation. This survey, conducted in April/May of 2009 in a joint effort between the USCG and SUPSALV, concluded that approximately 37,000 gallons of 115/145 aviation gasoline remains stored in cargo tank, B-10, and 28,000 gallons of a mixture of motor gasoline and aviation fuel remain in cargo hold B-8. Approximately 7,500 gallons of diesel fuel remain in two tanks, C905, and the port main service tank, C902F. Residual, but insignificant, amounts of gasoline remain in pockets between the frame members in tanks B-2 through B-7 and B-9. Figure 1 depicts the remaining pumpable product aboard the Ex-*Chehalis*.

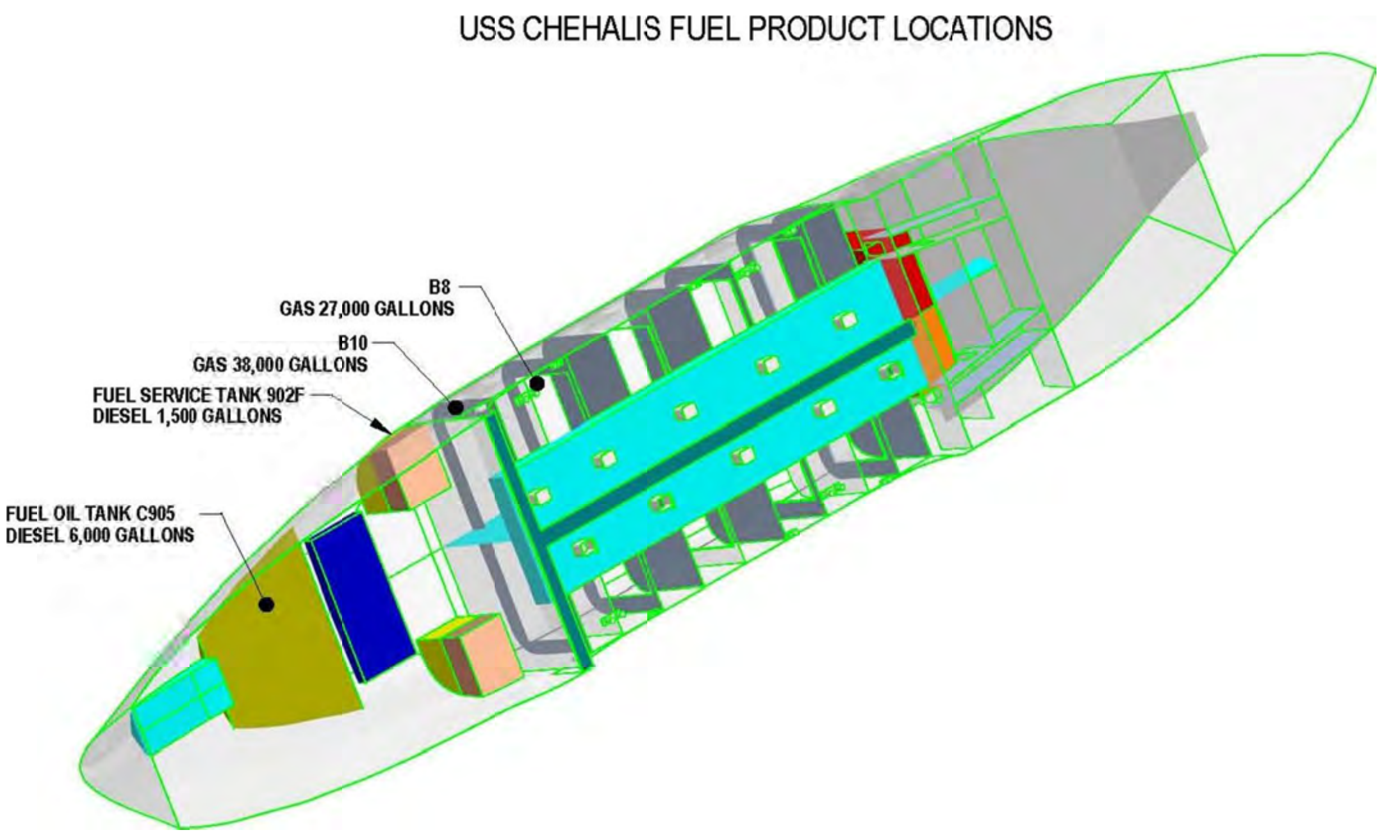

Figure 1. Ex-USS *Chehalis* Showing Tanks with Pumpable Petroleum Products

4.0 CONCEPT OF OPERATIONS

The following sections describe the critical elements applicable to the offload operation.

4.1 Safety. The safety of personnel and equipment is paramount when dealing with the highly volatile 115/145 aviation gasoline aboard the Ex- *Chehalis*. Safety procedures must be strictly enforced throughout the operation and special attention be given to the control of product flow rates, static electricity, bonding, and safe equipment, including communications and photographic equipment. The possession of, as well as the use of, cell phones, computers, and other equipment will be prohibited within the designated operational area during pumping operations. While the proper intrinsically safe equipment is required in the conduct of the operation, Command and Control is as equally essential to the safe accomplishment of the offload. Each critical point in the pumping/receiving system must be manned by a two person team, and a single qualified individual will be designated as the Person in Charge (PIC) of the entire pumping operation. The PIC will validate the continuity and integrity of the hose system, the position of each valve within the system and the communications chain between all elements of the system before initiating fuel movement operations. In addition to the onboard charged fire fighting system aboard the support vessel, local firefighting, medical, and law enforcement assets will be integrated into the operation. They will be notified of the schedule as well as being notified of the start and conclusion of all pumping and fuel handling operations. A detailed safety plan will be prepared, briefed, and strictly enforced throughout the entire operation.

4.2 Environmental Preparedness. In the event of a drilling or pumping mishap, environmental preparedness will consist of boom systems deployed around the critical elements of the operation, readily available sorbents for small spills, small skimmers, and small storage bladders. In addition, booms will be placed in the water around the American Samoa Government (ASG) fuel pier to prevent any fuel from going under the pier, trapping vapors that could prove explosive. An on-call response contractor shall be accessible through local contract to provide additional personnel and response equipment. All hoses, valves, pumps, receiving vessel connections, and containers will be pressure and dye tested before any pumping of highly flammable products.

4.3 Pumping Operations. The Ex-*Chehalis* offload concept of operations involves the deployment of divers to insert suction hoses (with a buoyant end fitting) into the cargo tanks containing gasoline, B-10 and B-8, through their respective (ROTH) hatches. The buoyant end fitting will allow the suction hose to find its way to the top of the tank. Once the hoses are in place and properly bonded, an intrinsically safe surface mounted vacuum/suction pump will draw the fuel from the tank and push the fuel through a flow/sampling manifold onward to the receiving vessel. Flow rates through the pumping system will be constantly monitored to insure the rate remains below the accepted gallons per meter/per hose size required for anti-static purposes. A sampling port in the pumping/manifold system will allow the sampling of product flowing through the system and will be used to determine when all pumpable product has been removed from the tank. Several settling and stripping cycles will further capture the remaining pumpable product.

The two diesel tanks will be offloaded using a Lightweight Hot Tap System because the tanks are accessible from the hull shell plate. These two tanks will be hot tapped at their high points taking into account the ship's orientation as determined in the 2009 survey. Should the pump flow be insufficient, a water inlet hole will be punched low in the tank to allow for water ingress to replace the pumped off product. The diesel product will be pumped along a floating hose line directly to the fuel pier where it will be put into tank trucks and taken to the processing site.

Estimates show that the above procedures will remove the vast majority of gasoline (98%) and oil (99%) from the cargo holds and tanks. For ease of discussion, we have defined this resulting condition as state of cleanliness condition State 1. The remaining 2% of the product will require a more intense effort by "vacuuming" the cargo holds with divers operating from within the tank with suction wands, literally vacuuming the areas between the frames where the remaining product is trapped. Using this technique, one can expect a 99% removal of the accessible product. We have labeled this state of cleanliness State 2. Should 99+ % of product removal be required, each cargo hold would need to be inverted, and several hot tap access holes cut through the top shell plates in each tank so that all air, gas, and residual products can be removed and disposed of. The starboard side tanks would be hot tapped from inside the port tanks directly above the high points in the respective starboard tank. This would allow the residue to escape into the port side tanks and migrate to the high point in the port side tank where it would be removed through the hot tap valves. This end state is referred to as State 3.

4.3.1 Offload Operations. Regardless of the end state desired, the bulk of the offload operations are all aft of the Ex-*Chehalis*' mid section, and these operations will be conducted from a support vessel positioned to facilitate diver descent into this primary operational area. Pumping operations will likely be located inboard of the Ex-*Chehalis*, between it and the ASG fuel pier. As a safety precaution, the pumping platform will be an independent platform alongside the primary receiving platform. The pumping station will be located on a small, perforated decked, floating platform above the wreck at or near water surface level alongside the primary support vessel. Hose floats will suspend the suction side of the hose system. The hose floats will also be positioned to prevent any lazy loops from forming in the hose, providing a smooth passage of the product from the cargo hold, through the (ROTH) hatch and to the surface. Figure 2 depicts the notional arrangement of the support vessels and the pumping station. The hose sections, where possible, will be continuous to avoid the possibility of leakage in the connections. Hose end fittings will be of the swage configuration to eliminate the possibility of leakage that may occur with banded fittings and light fuels. A monitoring/sampling manifold will be placed downstream of the pump on the receiving vessel. This will serve to measure flow as well as draw samples of the product in the lines before the product reaches the designated tank. Valves will be positioned along the hose line at strategic places to allow servicing and provide readily accessible shut offs in case of an emergency. As described in the safety overview, the entire system will be manned at the critical points, and the PIC will verify that all valves and critical elements of the system are in the correct position before pumping commences.

Ideally, pumping operations should only take place during daylight hours, and no pumping should start unless there is sufficient daylight to complete the discharge of the designated cargo hold or tank within daylight hours.

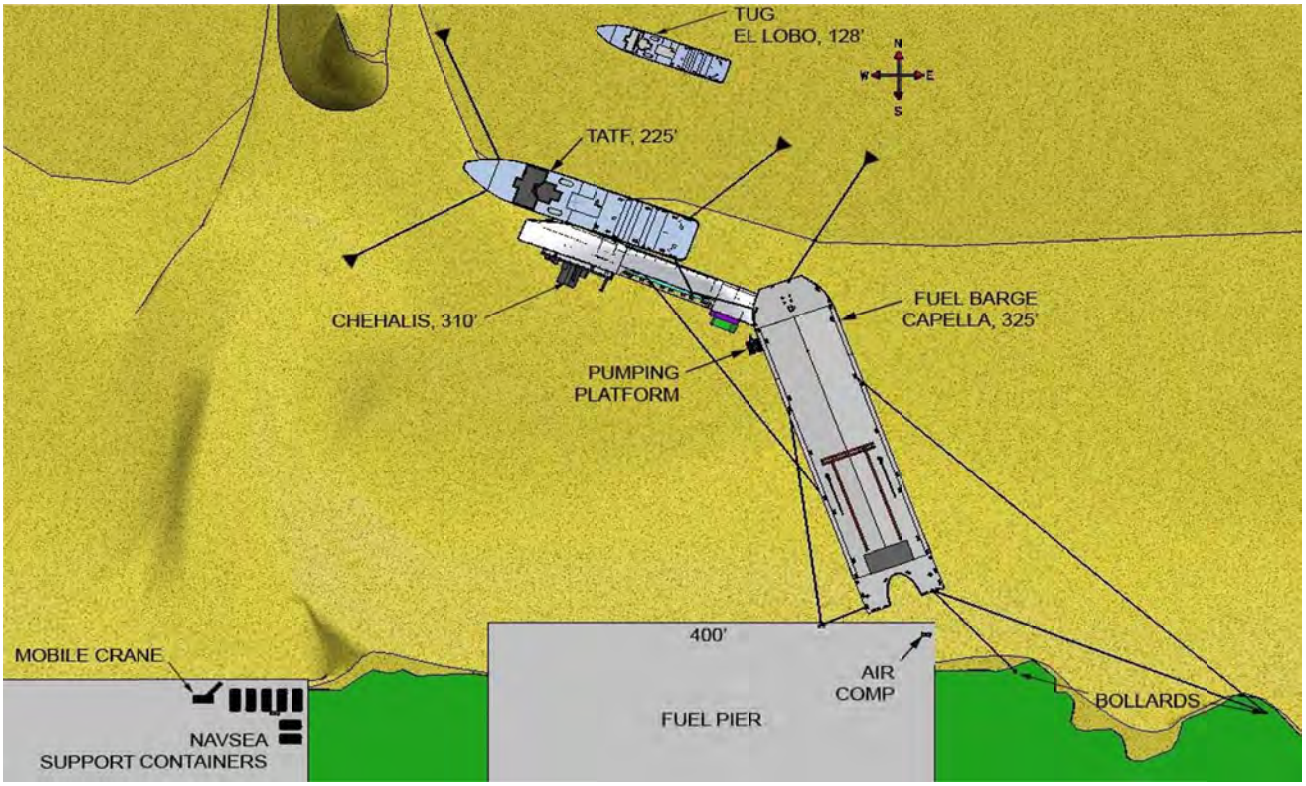

Figure 2. Notional Ex-USS *Chehalis* Pumping Platform Configuration

5.0 ASSUMPTIONS

The following assumptions are universally applicable to the discussion of viable offload and disposal options summarized in Appendix C and Appendix D:

a. The ASG, in concert with the fuel facility, will assist in scheduling a time window of approximately 20 days where operations can take place without interference from large tanker operations on the adjacent fuel pier. Cleanliness States 2 and 3 would require a total of 28 days or more.
b. The ASG will designate the east side of the fuel pier for support operations available during the 20 day period as done during the survey. Cleanliness States 2 and 3 would require a total of 28 days or more.
c. In those options where ASG assets such as tugboats and barges are considered options, the ASG will provide those assets at the published tariff rates or at more cost favorable rates.
d. Where waivers are required, the USCG and the ASG will coordinate to accomplish those waivers.
e. Local ASG fire, safety, and medical services will be on-call to support emergency response should the need arise.
f. Platforms considered for support will provide their own anchoring systems except as noted throughout Section 6.0.
g. The diesel fuel can be disposed of in American Samoa as discussed with several local authorities and commercial enterprises.

6.0 OPERATIONALLY VIABLE OFFLOAD OPTIONS

With the above generic concept of operations taken into account, four executable options should be considered for the offload as discussed below:

6.1 Option A, Military Vessels/Military Divers. Option A considers the use of military vessels as the primary operational support platform and military divers augmented with SUPSALV technical and equipment support to conduct the operation. The Navy, Army, and the USCG have vessels well suited for accomplishing the support platform requirements. These assets are located in the Pacific region. The U.S. Navy's T-ARS class salvage ships are located in Hawaii and Sasebo Japan. The U.S. Army LSVs and the USCG Buoy Tender are located in Hawaii. All three classes of ship are adequately outfitted for transit to Pago Pago and fully support the mission. The advantage of the Hawaii based vessels is that they would serve as the transport platform for the U.S. Navy divers and their equipment all of which are based in Hawaii. A further advantage in the use of the T-ARS, LSV, or Buoy Tender class of ships is that they may already be funded to support operational requirements in the geographical region. As a result, they may be available at no cost or at a minimal cost to the operation. These vessels also have their own anchoring systems aboard as standard equipment. Military divers come with all the capabilities to operate in Pago Pago where self-sufficiency is required for diving operations. This is important as neither the recompression chambers, nor the divers' air facilities, are available in the region. In addition, the divers from MDSU 1, located in Hawaii, conducted the survey on the Ex-*Chehalis* in May of 2009 and as a result are operationally familiar with the ship. They have also performed successful pumping operations on the *Ehime Maru*, the USS *Mississinewa*, and the *Chung Chen*.

6.2 Option B, ASG Vessels/Military Divers. Option B includes the use of ASG vessels and military divers augmented with SUPSALV technical and equipment support to perform the offload. The ASG has the MV *Sili* capable of serving as a dive and working platform for the operation as well as a 30 foot open platform boat. Use of these vessels would require approval of the ASG and coordination for their dedicated use during the planned operation. Coordination regarding the use of these assets might be conducted through an official request from the USCG District Office, Honolulu. In the formulation of the cost estimates to conduct the offload operation using ASG vessels, costs were developed using the published tariff rates. If substantially reduced rates can be negotiated on a government-to-government basis, it would significantly reduce costs. It is understood that the ASG has two barges and an ocean going tugboat en route that may be available for support platform operations. As with Option A, military divers would perform the diving operations required for hose insertion and hot tapping operations.

6.3 Option C, Commercial Vessels/Military Divers. Option C includes the use of commercial vessels and military divers augmented with SUPSALV technical and equipment support to perform the offload. During Phase 1 of the operation, the survey was conducted utilizing a locally available barge, BD 6235, anchored over the Ex-*Chehalis*. This same platform, although not ideal, could also serve as the support platform for the offload operation. The advantage of this asset is that it is locally available and viable if the disposal of the product is completed in close proximity and at sea. This option would likely require mooring systems to be brought in. If it is decided that the product must be disposed of at some distant processing facility, then it would be more cost effective to utilize a commercial barge and tugboat combination as both the operational platform and the towing vessel for returning the product to the designated facility. This option capitalizes on the employment of military divers as detailed in Options A and B with the exception of the use of commercial waterborne support platforms.

6.4 Option D, Commercial Vessels/Commercial Divers. Option D is primarily a commercial operation augmented with SUPSALV oversight, technical, and equipment support to perform the offload. As in Option C, commercial vessel platform alternatives support the operation. In this option commercial divers provide all of the dive equipment and perform all of the underwater tasking. As with any commercial operation, all of these services are billed at a negotiated rate and the operation does not benefit from the operationally funded assets of the military divers.

7.0 LEVEL OF CLEANLINESS

Applicable to all of the options discussed above is the question: "How clean is clean?" Three states of cleanliness are considered and discussed briefly below as States 1, 2, and 3. As the level of cleanliness increases, the time on station increases, and the associated cost of the operation escalates. Below is a brief summary of the possible levels of cleanliness that could be achieved in the cargo holds B-1 through B-10. All three states of cleanliness will remove 99% of the diesel product in C905, the fuel service tank 304F, and secure the opened cargo hatches as well as the shell plate penetrations.

7.1 State 1. At Level of Cleanliness State 1, all readily pumpable gasoline product is removed from tanks B-8 and B-10 with the initial pumping operation. In addition, once the majority of gasoline has been removed from each tank, a diver will enter the tank and reposition the suction head at the high point in the tank. Pumping will start again and continue until no product is detected at the sampling manifold. The tank will be allowed to settle and be pumped again. This cycle will be repeated in B-8 and B-10 until no product is found at the sample station. It is anticipated that 98% of the accessible product will be removed from the Ex-*Chehalis* in this state of cleanliness. The risk of a catastrophic release from the Ex-*Chehalis* in the future will be eliminated in this state of cleanliness.

7.2 State 2. At Level of Cleanliness State 2, all of the cargo holds, B-1 through B-10, would be vacuumed with a diver-operated suction wand. The expectation is that an additional 10 operational days are required to complete this process which would result in approximately 99% of the accessible fuel being removed from the vessel. This option adds an estimated 8 – 10 days to the base line operation in State 1.

7.3 State 3. At Level of Cleanliness State 3 would involve inverting of each cargo hold to form a gas free atmosphere in the top of the tanks. After an inert barrier is established, each cargo hold would be hot tapped, and the air evacuated, followed by any remaining product. This procedure may need to be accomplished several times in each cargo hold, between each frame space. It is estimated that this will add an additional 12 – 14 days to the operation when compared to State 1. This would result in 99+ % removal of product.

Appendix C summarizes the ROM estimated costs of the offload options and states of cleanliness discussed above.

8.0 EX-USS *CHEHALIS* RECOVERED PRODUCT DISPOSAL ALTERNATIVES

While numerous disposal alternatives are available, they can be consolidated into five viable alternatives that are discussed below. There are three possible disposal methods for the gasoline: evaporation, burning, and transport to a facility for re-use or reprocessing. Appendix A contains the fuel composition analysis obtained from the survey for the gasoline located in cargo holds B-8 and B-10. The diesel fuel can be processed in American Samoa and used as fuel for the tuna processing plants.

8.1 A Brief Discussion on Methods of Disposal.

a. **Method 1, Evaporation, Open Method on Water.** The National Oceanic and Atmospheric Administration (NOAA) models and studies indicate that if the entire volume of gasoline was released at one time, 99+ % of it would evaporate within 2 to 3 hours. A copy of the analysis is contained in Appendix B. To accomplish the controlled release of the gasoline based on this data, each of the two cargo holds, B-8 and B-10, would be offloaded into a SUPSALV provided 50,000 gallon oil recovery bladder, or several ISO containers, or a certificated gasoline barge. Either of these transport options would be fitted with an offload pump on the stern and a long tail hose. The bladder, tanks, or barge would be loaded from the pumping platform. On completion of each cargo hold, the bladder, tank, or barge will be towed to the approved dumping ground behind a tugboat. In the dumping ground, the safety valves would be opened, and the recovered product pumped off while being towed up current and up wind. Depending on the weather conditions, all of the product released from each bladder load should evaporate in less than 1 hour. At the completion of the operation, the bladder, tanks, or barge would be cleaned for re-use. The implementation of this alternative requires coordination and agreement between governmental authorities including: USCG, ASG, EPA Region 9, NOAA, the Oceans Region Response Team (ORRT), and others prior to commencing this operation. This is the most cost effective, and possibly the most environmentally sound, of the available disposal alternatives.

b. **Method 2, In-situ Burning, and Flaring.** Like the evaporation disposal method described above, 99+ % of the recovered product can be disposed of by flaring. Portable flaring equipment would be rented, and then shipped to Pago Pago on commercial vessels. The flaring equipment consists of a semi-trailer mounted burner assembly with an exhaust stack, five large air compressors, a large propane tank, and a feed or day tank for a limited amount of the recovered product. While it is possible to mount the unit on a barge, shore side placement accessible to barge access would be preferable and far less costly. It is estimated that it would take 3 weeks of 24 hour incineration to dispose of the 65,000 gallons of gasoline and the associated slops.

c. **Method 3, Transport of the Recovered Product and Slops to a Reprocessing Facility.** This method of disposal involves offloading the product into an oceangoing, certificated vessel, or barge for transport to a facility capable of either reusing the fuel or processing the fuel for disposal. Likely candidates for processing have been located in Singapore and on the West Coast of the U.S. This method, while viable, consumes a lot of fuel and vessel underway time. The vessel must transit to American Samoa, load, and transit to the processing facility. The vessel then offloads, transits home, and undergoes a cleaning operation subsequent to the discharge of the product.

8.2 Disposal Alternative A, SUPSALV Oil Recovery Bladder/ASG Vessels. Alternative A utilizes a 50,000 gallon SUPSALV oil recovery bladder and locally available ASG tugboats as the primary assets required to implement either Method 1, disposal by evaporation of the recovered product or Method 2, incineration of the product onshore within the confines of the harbor. The SUPSALV oil recovery bladder is readily transportable on military or commercial shipping in to and out of American Samoa and involves no rental costs.

8.3 Disposal Alternative B, ISO Containers/ASG Vessels. This alternative employs leased commercial ISO containers positioned aboard ASG barges to receive the recovered product. It is envisioned that at least eight, 6,000 gallon ISO containers would be secured on deck of the barge giving a total capacity of 48,000 gallons, sufficient to offload the largest cargo hold on the Ex-

Chehalis in one pumping session. This alternative has several caveats including the fact that the barges procured by the ASG are not yet on the island and may require a waiver to work offshore in the disposal area. A distribution manifold would need to be built to safely disperse the product. In addition, the containers would need to be thoroughly cleaned before returning them to the owners. The ISO container concept can also be employed in support of the in-situ burn method of disposal as the containers could be shuttled back and forth to the burn site on the barges until the operation is complete.

8.4 Disposal Alternative C, SUPSALV Oil Recovery Bladder/Commercial Vessels. This alternative is essentially a modification of Alternative A with the exception that commercial vessels are employed for the towing of the bladder and offshore operations. This would require that a suitable towing vessel be brought in from outside of American Samoa, resulting in additional costs for transit and the associated fuel charges.

8.5 Disposal Alternative D, ISO Containers/Commercial Vessels. Alternative D is a modification of Alternative B with the use of commercially procured tugboat assets to perform the towing and offshore operations. As in Alternative C, this will result in additional costs for transit time and fuel for the outside resources.

8.6 Disposal Alternative E, Commercial Barge/Commercial Tugboat. Alternative E utilizes a commercial barge and tugboat to receive the product and tow it to the designated disposal site. In all methods of disposal under Alternative E, the barge and tugboat would come from outside American Samoa as there are no commercially available assets in the country. Under this alternative, the barge would need to be certificated to carry gasoline. It is important to note that with this option, the amount of fuel consumed in transit to and from American Samoa to dispose of the recovered product will most likely exceed the quantity of the recovered product to be disposed.

Appendix D summarizes the disposal methods and alternatives with respect to costs.

9.0 ANALYSIS OF ALTERNATIVES

It is not the purpose of this report to make specific recommendations. However, SUPSALV was tasked to support the decision makers by determining the technical procedures, risks, and ROM costs of all reasonably feasible options. Accordingly, Appendices C and D summarize 12 alternatives for conducting the offload of the Ex-*Chehalis* and the same number of alternatives for the disposal of the recovered products. By combining alternatives from each of these two Appendices, one can analyze numerous alternatives for accomplishing the mission of mitigating the risk of a catastrophic release of petroleum products from the Ex-*Chehalis*. Appendices C and D represent a rough estimate of costs as described throughout the document and are subject to the assumptions in Section 5.0. In both offload and disposal, the use of government assets represents significant cost savings as well as a unique opportunity to exercise and train on the government assets applicable in mitigating the risks involved with public vessels.

9.1 Offload Options. With respect to the desired end state of cleanliness, State 1 completely removes the catastrophic release scenario from the Ex-*Chehalis*. Any state of cleanliness beyond State 1 is both time consuming and costly. The product that remained after the offload to State 1 would most likely evaporate within 5-10 minutes of reaching the surface. Cleaner states would reduce the potential of any future safety issues for recreational divers although the location of theEx-*Chehalis* off the fuel pier makes recreational diving on her unlikely. All states of cleanliness include securing the cargo tank (ROTH) deck hatches. This would not prevent diver access through other openings in the Ex-*Chehalis*.

9.2 Disposal Options. In considering the disposal options, the Ex-*Chehalis* offers a unique opportunity to utilize scientific data to support what may be considered a controversial disposal methodology; evaporation on the surface of the ocean. The intentional release of the recovered gasoline products directly on the ocean surface in an EPA designated and approved "Dumping Ground" and allowing it to evaporate, is supported by Appendix B. Due to the amount of time, safety risk, pollution, expended fuel, and increased costs associated with the flaring or transport of the recovered product to an off island disposal facility, the pros and cons of the evaporation option should be openly discussed.

9.3 Further Action. When acceptable courses of action are selected for the offload and the disposal, SUPSALV is prepared to write a detailed Ex-*Chehalis* Offload and Disposal Plan to fully support the selected course of action.

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APPENDIX A – FUEL TANK SAMPLE RESULTS FROM THE SURVEY

INDEPENDENT PETROLEUM LABORATORY LTD

Specialists in Fuels and Environmental Analysis

BP Avgas Test Report / Batch Certificate

Your Testing Partner

Location	Pago Pago	After Ship	Chehalis
Tank Number	B-8	Voyage Number	Unknown
Customer Reference		Supplier	Unknown
Batch Number	Unknown	Date Drawn	03-May-09
		Date for Retest	Not Applicable
Quantity in Tank :- (litres)		Before	
		After	

Method	Properties	Units	324580 (Report Number / COQ Numbers) / Unknown (Batch Number)	Notes	Maximum Difference	Spec Limits
D4052	Density @ 15°C	kg/L	0.7418		0.003	
D86A	Initial Boiling Point	°C	32.5	(2)	8	
	10% Volume Evaporated @	°C	64.2		4	max 75
	40% Volume Evaporated @	°C	109.1		6	min 75
	50% Volume Evaporated @	°C	118.8		6	max 105
	90% Volume Evaporated @	°C	176.7		6	max 135
	Final Boiling Point	°C	202.8		10	max 170
	Recovered	%vol	97.8		-	min 97
	Residue	%vol	1.0		-	max 1.5
	Loss	%vol	1.2		-	max 1.5
	10% Evap Temp + 50% Evap Temp	°C	183.0		10	min 135
D5191	DVPE	kPa	54.5		4.5	38 - 49
D4176	Appearance @ Ambient Temperature	-	Clear and Bright	(1)	-	Clear and Bright
Visual	Colour	-	Pale Yellow	(1)	-	Green
D130	Copper Strip @100°C	-	1a		-	max 1
D1094	Change in Water Volume	mL	0.0		-	-2 - 2
	Interface Condition	-	1b		-	
D381	Existent Gum	mg/100mL	5		3	max 3
IP270	Lead	g/L	0.343		0.05	max 0.85

Certified that this sample has been tested as received in accordance with current editions of ASTM and IP methods and FAILS to MEET the requirements of Specification DEF STAN 91-90, Issue 2, (DERD 2485), with respect to the results given above.

This report shall not be reproduced either in part or whole without written approval of this Laboratory.

Notes:

(1) Not IANZ Accredited

(2) Results have been corrected for barometric pressure.

new zealand accredited laboratory

Authorised Signature: [signature] Name: Graham Brosbury Date: 25/05/09

Independent Petroleum Laboratory Ltd (IPL), PO Box 3, Ruakaka, Northland, NEW ZEALAND

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BP Avgas Test Report / Batch Certificate

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Location	Pago Pago	After Ship	Chehalis
Tank Number	B-10	Voyage Number	Unknown
Customer Reference		Supplier	Unknown
Batch Number	Unknown	Date Drawn	02-May-09
		Date for Retest	Not Applicable
Quantity in Tank :- (litres)		Before	0
		After	

Report Number / COQ Numbers	324581	Notes	Maximum	Spec
Batch Number	Unknown		Difference	Limits

Method	Properties	Units	Result	Notes	Maximum Difference	Spec Limits
D4052	Density @ 15°C	kg/L	0.7022		0.003	
D86A	Initial Boiling Point	°C	37.7	(2)	8	
	10% Volume Evaporated @	°C	73.2		4	max 75
	40% Volume Evaporated @	°C	96.5		6	min 75
	50% Volume Evaporated @	°C	100.2		6	max 105
	90% Volume Evaporated @	°C	117.9		6	max 135
	Final Boiling Point	°C	156.1		10	max 170
	Recovered	%vol	98.5		-	min 97
	Residue	%vol	1.0		-	max 1.5
	Loss	%vol	0.5		-	max 1.5
	10% Evap Temp + 50% Evap Temp	°C	173.4		10	min 135
D5191	DVPE	kPa	41.7		4.5	38 - 49
D4176	Appearance @ Ambient Temperature	-	Clear and Bright	(1)	-	Clear and Bright
D130	Copper Strip @100°C	-	1a		-	max 1
D1094	Change in Water Volume	mL	0.0		-	-2 - 2
	Interface Condition	-	1b		-	
D381	Existent Gum	mg/100mL	2		3	max 3
IP270	Lead	g/L	1.292		0.05	max 0.85
Visual	Colour	-	Pale Yellow	(1)	-	Green

Certified that this sample has been tested as received in accordance with current editions of ASTM and IP methods and FAILS to MEET the requirements of Specification DEF STAN 91-90, Issue 2, (DERD 2485), with respect to the results given above.

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(2) Results have been corrected for barometric pressure.

new zealand accredited laboratory

Authorised Signature: G. Bradbury Name: GRAHAM BRADBURY Date: 25/05/09

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APPENDIX B – NOAA EVAPORATION ANALYSIS

Sent: Tuesday, June 09, 2009 11:58 PM
To: Worthington, Ron T.
Cc: Stacey LT Crecy; Jose LCDR Herrador
Subject: Re: *Chehalis* Fuel samples

Hello Ron,

We entered the data for the 2 USS *Chehalis* fuel sample results you sent into ADIOS 2 and ran the model for 5, 10, and 15 knot winds for each fuel. Please find the model run results attached. The model indicates either fuel would evaporate very quickly - within a couple of hours. Note that we assumed 65,000 gallons released for each run - which would be a worse case (more persistent) than the volumes reported for each fuel (37,000 and 28,000 gallons, respectively). Keep in mind, however, that the model assumes release in open-water conditions with spreading and no containment. Containment of the fuel would slow the evaporation rate.

Let me know if you have any questions or need anything else.

Best Regards,
Ruth

7600 Sand Point Way NE
Seattle, WA 98115
Office: (206) 526-6081
Cell: (206)849-9926
Fax: (206)526-6349
~~24 Hour Emergency: (206)526-4911~~

5 Knot Winds Sample No.1

Oil Name = AVGAS (SAMPLE NO.1)
API = unknown
Pour Point = unknown
Wind Speed = constant at 5 mph
Wave Height = computed from winds
Water Temperature = 80 deg F
Time of Initial Release = June 9, 1500 hours
Total Amount of Oil Released = 65,000 gal

Hours Into Spill	Released gal	Evaporated percent
1	65,000 -	100
2	65,000	100

<u>10 Knot Winds Sample No.1</u>
Oil Name = AVGAS (SAMPLE NO.1)
API = unknown
Pour Point = unknown
Wind Speed = constant at 10 mph
Wave Height = computed from winds
Water Temperature = 80 deg F
Time of Initial Release = June 9, 1500 hours
Total Amount of Oil Released = 65,000 gal

Hours Into Spill	Released gal		Evaporated percent		Dispersed percent
1	65,000	-	100	-	0
2	65,000		100		0

<u>15 Knot Winds Sample No.1</u>
Oil Name = AVGAS (SAMPLE NO.1)
API = unknown
Pour Point = unknown
Wind Speed = constant at 15 mph
Wave Height = computed from winds
Water Temperature = 80 deg F
Time of Initial Release = June 9, 1500 hours
Total Amount of Oil Released = 65,000 gal

Hours Into Spill	Released gal		Evaporated percent		Dispersed percent
1	65,000	-	100	-	0
2	65,000		100		0

<u>5 Knot Winds Sample No.2</u>
Oil Name = AVGAS (SAMPLE NO.2)
API = unknown
Pour Point = unknown
Wind Speed = constant at 5 mph
Wave Height = computed from winds
Water Temperature = 80 deg F
Time of Initial Release = June 9, 1500 hours
Total Amount of Oil Released = 65,000 gal

Hours Into Spill	Released gal		Evaporated percent		Remaining percent
1	65,000	-	100	-	0
2	65,000		100		0

10 Knot Winds Sample No.2

Oil Name = AVGAS (SAMPLE NO.2)
API = unknown
Pour Point = unknown
Wind Speed = constant at 10 mph
Wave Height = computed from winds
Water Temperature = 80 deg F
Time of Initial Release = June 9, 1500 hours
Total Amount of Oil Released = 65,000 gal

Hours Into Spill	Released gal		Evaporated percent		Dispersed percent
1	65,000	-	100	-	0
2	65,000		100		0

15 Knot Winds Sample No.2

Oil Name = AVGAS (SAMPLE NO.2)
API = unknown
Pour Point = unknown
Wind Speed = constant at 15 mph
Wave Height = computed from winds
Water Temperature = 80 deg F
Time of Initial Release = June 9, 1500 hours
Total Amount of Oil Released = 65,000 gal

Hours Into Spill	Released gal		Evaporated percent		Dispersed percent
1	65,000	-	100	-	0
2	65,000		100		0

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APPENDIX C – EX-USS *CHEHALIS* OFFLOAD OPTIONS MATRIX WITH ASSOCIATED ESTIMATED COSTS MATRIX

Final State	**Option A** Military Divers/Vessels	**Option B** Military Divers/ASG Vessels	**Option C** Military Divers/Commercial Vessels	**Option D** Commercial Divers/Vessels
State 1 (Mitigate Catastrophic Release) 98% Gasoline Removed 99+ % All Pumpable Diesel Removed Secure All Cargo Hatches, 20 Days	$560,000	$1,020,000	$937,000	$1,150,000
State 2 (Mitigate Catastrophic Release, Vacuum Cargo Holds) 99% Gasoline Removed 99+ % All Pumpable Diesel Removed Secure All Cargo Hatches, 28 Days	$616,000	$1,268,000	$1,167,000	$1,558,000
State 3 (Mitigate, Vacuum, Inert, Hot Tap Tanks) 99+ % Gasoline Removed 99% All Pumpable Diesel Removed Secure All Cargo Hatches, 30 + Days	$833,000	$1,495,000	$1,411,000	$1,844,000

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APPENDIX D – EX-USS CHEHALIS RECOVERED PRODUCT DISPOSAL ALTERNATIVES WITH ASSOCIATED ESTIMATED COSTS

Method of Disposal	**Level of Cleanliness**	**Alternative A** Dracone/ASG Vessels	**Alternative B** ISO Tanks/ASG Vessels	**Alternative C** Dracone/Commercial Vessels	**Alternative D** ISO Tank Containers/Commercial Vessels	**Alternative E** Barge/Tugboat Commercial
Method 1 **Evaportation** Tow Offshore and Control Release in the EPA Approved Dumping Ground	State 1	$215,000	$568,000	$784,000	$1,071,000	$1,470,000
	State 2	$240,000	$630,000	$896,000	$1,179,000	$1,650,000
	State 3	$260,000	$663,000	$943,000	$1,236,000	$1,740,000
Method 2 **In-situ Burn** Tow to a Controlled Burn Site in Pago Pago Harbor	State 1	$1,241,000	$1,690,000	$1,877,000	$2,075,000	$2,781,000
	State 2	$1,737,000	$2,213,929	$2,440,000	$2,654,000	$2,961,000
	State 3	$1,862,000	$2,353,432	$2,482,000	$2,703,000	$3,053,000
Method 3 **Transport to a Reprocessing/Disposal Facility (Singapore/Hi/NZ)** Offload into a Certificated Vessel and Transport to a Viable Reprocessing/Disposal Facility	State 1	Not Feasible	Not Feasible	Not Feasible	$1,729,000	$1,654,000
	State 2	Not Feasible	Not Feasible	Not Feasible	$1,987,000	$1,654,000
	State 3	Not Feasible	Not Feasible	Not Feasible	$2,098,000	$1,747,000

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APPENDIX E – AMENDMENT TO EX-USS *CHEHALIS* (AOG-48) GASOLINE OFFLOAD AND DISPOSAL OPTIONS

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Amendment to

EX-USS *CHEHALIS* (AOG 48)
GASOLINE OFFLOADING and DISPOSAL OPTIONS
PAGO PAGO, AMERICAN SAMOA

From Survey Conducted
24 April–10 May 2009

Supervisor of Salvage and Diving
Naval Sea Systems Command
1333 Isaac Hull Avenue, SE (Mail Stop 1072)
Washington Navy Yard, DC 20376

8 September 2009

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1.0 PURPOSE

The purpose of this amendment is to refine the concept of operations and available options for the safe offloading and disposal of the remaining 65,000 gallons of gasoline and 7,500 gallons of diesel fuel contained in the sunken Ex-*Chehalis* in Pago Pago Harbor, American Samoa. The options and alternatives presented in the initial report were discussed in a teleconference between the United States Coast Guard (USCG) District 14, USCG *Sector Honolulu* and SUPSALV on 10 August 2009. At that time, a determination was made that the proposed state of cleanliness, condition 1 (removal of all pumpable product) would apply to the operation regardless of which option was selected for the offload and disposal of fuels from the Ex-*Chehalis*. The offload options agreed upon to pursue further were: offload Option 1C (military divers/commercial vessels) supported if feasible by offload or Option 1A (military divers/military vessels). It was also agreed that thermal oxidation should be considered in lieu of flaring, originally described in Method C2, In Situ Burning/ Oil Storage Bladder /Commercial Tow Vessels and Method E2, In Situ Burning/Commercial Barge/Vessels. In addition, Method E3, disposal in a licensed processing facility using a certificated commercial barge and tug for transport, was to be developed in more detail.

The following presents a discussion of the agreed upon alternatives and summarizes a recommended course of action.

Sections of the original document that have not been changed in principal are not restated in this amendment. Should the reader not be familiar with the original document it is recommended that it be reviewed before reading this amendment.

2.0 GOALS AND OBJECTIVES

The goals of this report are:

a. Further explore, discuss, and evaluate the refined alternatives chosen by the USCG to safely conduct an offload and disposal of the Ex-*Chehalis*' remaining petroleum products.
b. Discuss and identify typical support vessel options and definitive disposal sites for the operation.
c. Refine the rough estimate of costs associated with the agreed upon options.
d. Present a decision rationale and recommendation for the final course of action to be taken regarding the offload and disposal of the gasoline and diesel fuels aboard the Ex-*Chehalis*.

3.0 BACKGROUND

Refer to the original document.

4.0 CONCEPT OF OPERATIONS

Refer to the original document.

5.0 ASSUMPTIONS

The following assumptions are applicable to the discussion of viable offload and disposal options summarized in Appendix C and Appendix D:

a. The American Samoa Government (ASG), in concert with the fuel facility, will assist in scheduling a time window of approximately 20 days where operations can take place without interference from large tanker operations on the adjacent fuel pier.
b. The ASG will designate the east side of the fuel pier for support operations available during the 20 day period as done during the survey.
c. Where waivers are required, the USCG and the ASG will coordinate to accomplish those waivers.
d. In the case where thermal oxidation is used for disposal, the government agencies involved will coordinate with the ASG agencies for the real estate required to house, secure, and operate the thermal oxidizer on a 24 hour basis for a period of 30 days.
e. Local ASG fire, safety, and medical services will be on-call to support emergency response should the need arise.
f. Vessel platforms used for support will provide their own anchoring systems except as noted throughout Section 6.0.

6.0 OPERATIONALLY VIABLE OFFLOAD OPTIONS CHOSEN

Subsequent to the presentation of the first report, the following two executable options discussed below are now considered viable for the offload.

6.1 Option 1A, Military Vessels/Military Divers. Option 1A considers the use of military vessels as the primary operational support platform and military divers augmented with SUPSALV technical and equipment support to conduct the operation. The Army and the Navy have vessels well suited for accomplishing the support platform requirements. These assets are located in the Pacific region. The U.S. Navy's T-ARS Class of salvage ships is located in Hawaii and Sasebo, Japan. The U.S. Army LSVs are located in Hawaii. All three classes of ships are adequately outfitted for transit to Pago Pago and fully support the mission. The advantage of the Hawaii based vessels is that they would also serve as the transport platform for the U.S. Navy divers and their equipment that are based in Hawaii. A further advantage in the use of the T-ARS and the LSV class of ships is that they may already be funded to support operational requirements in the geographical region, and as a result they may be available at no cost, or at minimal cost to the operation. These vessels have their own anchoring systems aboard as standard equipment. Military divers come with all the capabilities to operate in Pago Pago where self-sufficiency is required for diving operations. This is important as neither the recompression chambers nor the divers’ air facilities are available in the region. In addition, the divers from Mobile Diving and Salvage Unit (MDSU) 1, located in Hawaii, conducted the survey on the Ex-*Chehalis* in May 2009. As a result, the divers are operationally familiar with the Ex-*Chehalis*. They have also performed successful pumping operations on the *Ehime Maru*, the USS *Mississinewa*, and the *Chung Chen*. **NOTE: This option/discussion has not changed except that the use of a USCG buoy tender was eliminated as an operational platform due to operational commitments.**

6.2 Option 1C, Commercial Vessels/Military Divers. Option 1C includes the use of commercial vessels and military divers augmented with SUPSALV technical and equipment support to perform the offload. A certificated ABS class A fuel barge towed by an ABS classed oceangoing tug, or supply boat with a clear aft deck, is the most practical approach to providing a work platform for the offload and subsequently the safe transport of the recovered product. Supply vessels are more than twice as expensive as the smaller tug boats. Either alternative, tug or supply vessel, capitalizes on the employment of military divers as detailed in Option A. In pursuit of this option we have located a Class A fuel barge and a suitable tug in Singapore. Details of these vessels are attached as Appendices A and B respectively. **NOTE: While these two specific vessels are available now for a projected operational window of January/February 2010, they are commercial vessels and subject to "first come, first serve" forces of the market place. Also important to note is that vessels traveling to American Samoa will transit approximately 5200 NM each way from Singapore or 4300 NM from the U.S. West Coast. In the transit, they will consume a total of 250,000–285,000 gallons of fuel.**

Appendix C summarizes the offload options with respect to estimated costs.

7.0 LEVEL OF CLEANLINESS

Applicable to all of the options discussed above is the question: "How clean is clean?" Three states of cleanliness were originally considered. The USCG directed the use of State 1 as the end goal of the operation. At Level of Cleanliness State 1, all readily pumpable gasoline product is removed from tanks B-8 and B-10 and fuel oil tanks C905 and C902F with the initial pumping operation. In addition, once the majority of gasoline has been removed from each tank, a diver will enter the tank and reposition the suction head at the high point in the tank. Pumping will start again and continue until no product is detected at the sampling manifold. The tank will be allowed to settle and be pumped again. This cycle will be repeated in B-8 and B-10 until no product is found at the sample station. The settling process will also be employed in the fuel oil tanks. It is anticipated that 98% of the accessible product will be removed from the Ex-*Chehalis* in this state of cleanliness. It is also felt that the risk of a catastrophic release from the Ex-*Chehalis* in the future will be eliminated in this state of cleanliness.

8.0 EX-USS *CHEHALIS* RECOVERED PRODUCT DISPOSAL ALTERNATIVES

Subsequent to the initial report and discussions, courses of action for disposal were reduced to two basic concepts: destruction using thermal oxidation and ocean transport to a licensed reprocessing facility. The concept of evaporation was eliminated from consideration entirely. For conservative purposes, we are estimating a total of 100,000 gallons of product to be disposed of, consisting of 65,000 gallons of gasoline, 7,500 gallons of diesel fuel, and up to 27,500 gallons of slop/contaminated water.

8.1 A Brief Revised Discussion on the Selected Methods of Disposal, Method 2 and Method 3 from the Original Report.

a. **Method 2, In Situ Burning Employing Thermal Oxidation.** Portable thermal oxidizing equipment would be purchased and shipped to Pago Pago on commercial vessels. The thermal oxidizing equipment would consist of the main unit on a 40 foot ISO flat rack and a support unit in a 20 foot ISO container. This would be augmented with an SUPSALV generator, air compressors, and a small supply of locally available propane. While it is possible to mount the Thermal Oxidation unit on a barge, shore side placement is preferable and far less costly. With a burn rate of 3–4 gallons per minute, it is estimated that it would take 3 to 4 weeks of 24 hours a day incineration to dispose of the 65,000 gallons of gasoline, the 7,500 gallons of diesel, and the associated slops. In support of this operation, one would need to coordinate with the ASG for a sufficient hard stand work area in the proximity of the waterfront so that the temporary oil storage bladder or barge, supported by a suitable tow vessel for emergency evacuation, can feed fuel to the thermal oxidation units small 100–200 gallon storage tank at a rate of 180–240 gallons per hour. While the thermal oxidation of the fuel results in 99.9% effectiveness, this option requires further discussion of the safety risks involved that are primarily associated with the duration of the process. As previously noted, it is anticipated that the burn cycle would go on for 3 to 4 weeks, 24 hours a day. As a result, the barge or oil storage bladders would need to be moored and secured in Pago Pago harbor with the product aboard for almost a month, pumping intermittingly at an extremely low flow rate. This prolonged exposure invites safety risks and security concerns. The 24 hour work cycle further invites the potential of equipment failure, stress, and fatigue problems opening another window to safety considerations.

   We are also concerned about the use of the temporary storage bladders for storing fuel for nearly one month. The bladders are designed for temporary storage, and while they are durable, they should not sit alongside a pier or rocky shoreline rubbing and chafing for a month. A steel barge, while more durable, would also need to be adequately protected for the duration. These requirements necessitate a careful site selection and likely improvements to the waterfront area designated for the placement of the thermal oxidation unit and accessibility for the barge or bladder.

b. **Disposal Method 2 Alternative C, Thermal Oxidation, SUPSALV Oil Recovery Bladder/Commercial Vessels.** In this alternative, two SUPSALV 50,000 gallon oil recovery bladders are brought in to receive and store the product from the Ex-*Chehalis*. Subsequently, they are moored alongside at the designated thermal oxidation location and tended until they are offloaded. It should be noted that the oil recovery bladders are “temporary storage devices” and perhaps ideally suited for one of the original concepts, “evaporation at sea” wherein they were tasked to hold the recovered product for less than a day. Tasking these “temporary storage devices”, which are not classed vessels, to hold the product for a month may be risky, especially with the light fuels in the Ex-*Chehalis*. Additionally, the oil recovery bladder would need to be fitted with a pumping system that, must be submerged and operated intermittingly, somewhat akin to an on-water, 24 hour a day temporary gas station operation.

c. **Method 3, Transport of the Recovered Product and Slops to a Reprocessing Facility.** This method of disposal involves offloading the product into an oceangoing, certificated ABS Class A fuel barge for transport to a facility capable of either re-using the fuel or processing the fuel for disposal. Extensive efforts to find local processing sources were unsuccessful, but definitive sources have been located in Singapore and Utah. This method, consumes a lot of fuel and vessel underway time. The vessel must transit to American Samoa, load, and transit to the processing facility, offload, then transit home, and undergo a cleaning operation subsequent to the discharge of the product. Approximately 250,000–285,000 gallons of fuel will be consumed in the round trip ocean carriage of the fuel. In addition, the fuel must be transported inland from the West Coast port of entry to the disposal site in the case of the Utah facility.

d. **Disposal Method 3, Alternative E, Transport to a Processing Facility/Commercial Barge/Commercial Tug.** Alternative E utilizes a certificated ABS Class A commercial barge and an ocean classed tug/supply vessel to receive the product directly from the Ex-*Chehalis* and tow the recovered product to the designated disposal site. In all methods of disposal under this alternative, the barge and tug would come from outside of American Samoa as there are no commercially available assets in Samoa. American Samoa is exempt from the Jones Act, and the use of foreign registered vessels is permitted. Licensed processing facilities that will accept the recovered product have been identified in Singapore and on the U.S. West Coast. In Singapore, Prosper Marine would receive the recovered product into their own barge at anchor and transfer it directly to their facility. Should all 100,000 gallons of the recovered product be contaminated, the maximum cost for disposal, including cleaning, would be approximately $10,000. If the gasoline and oil are not further contaminated from the offload of the Ex-*Chehalis*, up to $5,000 could be rebated against the charges for processing and disposal. On the West Coast, Clean Harbors will accept the fuel at their Utah reprocessing facility. This would require a transfer from the barge to tank trucks for the onward transport to the Utah processing plant where it would be accepted. When additional transportation costs and the cleaning of the twelve trucks are factored in, the disposal costs approach $1.00 per gallon, or $100,000 for the projected product volume.

Appendix D summarizes the disposal methods and alternatives with respect to costs.

9.0 ANALYSIS OF ALTERNATIVES

9.1 Disposal Options

a. **In situ Burning (Thermal Oxidation)**. Thermal oxidation, offers interesting possibilities in terms of an efficient disposal technique. The thermal oxidation process explored uses the recovered product to preheat and burn off the product itself. The process requires a significantly smaller logistics support package when compared to the flaring process originally considered. The flaring process depended on a constant propane fuel source and a bank of five large air compressors to support the incineration. Both processes dispose of the recovered product at a rate of 3–4 gallons per minute in units that are reasonably transportable into geographical areas that are logistically challenging. Both units are equally efficient in disposing of the recovered product with 99% plus efficiency ratings. The thermal oxidation process is more efficient overall because it does not require an outside source of fuel to process the recovered product once ignited. To employ the thermal oxidation unit in Pago Pago, a site would need to be selected in conjunction with the ASG that has a hardstand surface, with 3–4 meters of water depth to securely accommodate the recovered product barge and at the same time provide safe distance buffers from population concentrations. Any required permits would need to be processed with ASG for approval and the site would need to be developed to safely and securely support the operation.

The slow burn rate of the thermal oxidation process presents significant operational and safety issues in temporary environments such as in Pago Pago. In order to process the planned 100,000 gallons of product and slops from the Ex-*Chehalis*, it is expected to take between three to four weeks of 24 hour a day operations. While the long duration presents staffing requirements for both the operation and security of the site, it presents even more risk because the recovered product must be stored for a long period of time, and the pumping operations must continue in short spurts to support the 3–4 gallons per minute burn rates. In addition, around the clock operations lend themselves to operational mistakes unless the staffing is robust and completely acclimated. The extended recovered product storage requirement and location induces high risk with the use of a temporary recovery oil bladder. These bladders are designed to serve as temporary storage devices for recovered oils while they transit over short distances to a more stable or permanent facility. While suitable for light oils, their numerous fittings may weep over an extended use. In addition, the pump attachment, in the case of the Ex-C*hehalis*, would be external and underwater. While most of these considerations could be mitigated with booming and a continuous watch over the oil storage bladder, it is felt that the bladder is a risky option for the longer term storage and pumping operation required in the thermal oxidation process. As a result, the better option from a safety and operational standpoint is the use of a certificated Class A barge, with deck mounted pumps and appropriate onboard firefighting equipment. While the rough order of magnitude costs have been developed for both options, the thermal oxidation/oil storage bladder option should be considered a higher risk operation than the thermal oxidation/certificated barge option if thermal oxidation is pursued further.

b. **Commercial Tug/Barge/ Reprocessing Facility.** As previously discussed, two certified sites have been identified that will receive and process the Ex-*Chehalis* recovered products: Prosper Marine in Singapore and Clean Harbors in California/Utah. Both facilities are certified to accept the product and re-use if possible in its compliant processes. The barge/tug combination depicted in Appendices A and B offers a safe and operationally efficient offload platform and transport option. The barge is appropriately classed as a Class A barge. Its capacity is in excess of the requirements for the operation as well as sufficient to store the fuel for the tug for the entire round trip. Especially noteworthy are the fire fighting capabilities of the barge consisting of the following: a fixed CO2 system, a deck foam system, two 300 gpm @ 10 psi and one 500 gpm @ 15 psi fire pumps, and an emergency 200 gpm @ 6 psi portable pump set. The fixed piping systems aboard the barge provide a safe transfer of the recovered product to the designated tanks once the product reaches the gunwale. In summary, the barge, while oversized, is well suited for the operation. The tug, *Maritime Raja* shown in Appendix B, is a relatively new (2005) Bureau VERITAS classed oceangoing tug with a sufficiently large aft deck from which to conduct diving operations. Figure 1 depicts the notional operational concept of the barge/tug combination at the Ex-*Chehalis* site. In that, the tug carries two 1600-lb bow anchors and her stern is secured to the Ex-*Chehalis*, she negates the need for additional anchor systems.

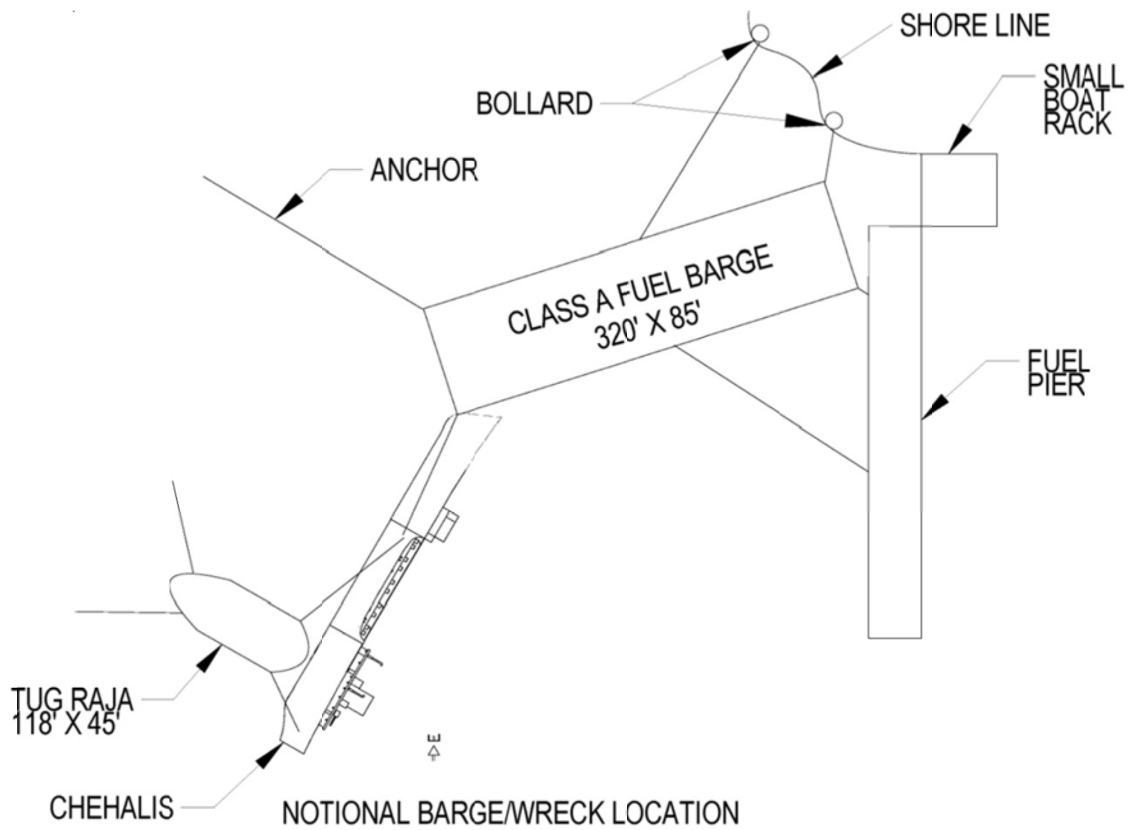


Figure 1. Ex-USS *Chehalis* Notional Barge/Wreck Concept

Appendix E summarizes the combined estimated costs for conducting the offload and disposal of the Ex-*Chehalis* recovered product. In summary, the use of the barge to transport the recovered product to the licensed disposal sites is not only cost effective, it also provides the least risk from an operational perspective.

9.2 Recommendations. With respect to overall cost, military divers, deployed on military vessels, an ARS or LSV, funded under training operations dollars and a commercial barge/small tug combination towing the recovered product to a reprocessing facility in Singapore is the most cost effective alternative. This combined operation employing a military vessel, an ARS and a commercial tug/barge was effectively used on the USS *Mississinewa* offload in 2002 with excellent results. Should the ARS or LSV not be available, the tug/barge combination would conduct the operation independently where the tug would serve as the diving platform. In addition to being economically most cost favorable, the barge/tug combination is arguably the safest alternative in that the high risk aspect of the operation revolves around the pumping operations. In the case of the barge operation, once the Ex-*Chehalis* cargo holds have been emptied, the barge can leave the operational area at the conclusion of the last pumping cycle, limiting exposure within the harbor significantly when compared to the Thermal Oxidation option which requires the extended stay of the barge and the associated long term pumping operation within Pago Pago harbor. Upon reaching the discharge port of call, the barge enters facilities designed to safely handle the cargo, and operational risks diminish when compared to operations in the temporary facilities that would be required of the thermal oxidation process.

For reasons of both cost and overall reduced risk, it is recommended that a course of action be taken to offload the Ex-*Chehalis* utilizing a military vessel and a commercial, properly certified barge/tug. Should the ARS or LSV not be available, it is recommended that the option of the commercial barge/tug out of Singapore be utilized as both the operational platform and the transport platform. It is further recommended that the recovered product be taken to Singapore for disposal through Prosper Marine.

APPENDIX A – Barge Sea Diamond Specifications

POSH Maritime Pte Ltd
No. 1 Kim Seng Promenade
#06-01, Great World City
Singapore 237994
Tel: (65) 6839 6500 Fax: (65) 6839 6511
Email: mktg_maritime@paccoffshore.com.sg
Website: www.posh.com.sg

SEA DIAMOND
60,000 BBL OIL STORAGE BARGE

Particulars

Length Overall	: 96.00 m 314'
Breadth Moulded	: 26.20 m 85'
Depth Moulded	: 6.00 m
Draft	: 4.69 m
Capacity	: 60,000 bbl
Class	: ABS A1 Oil Tank Barge Oil Storage Service
Deck Loading	: 5 T/M2
Year Built	: 1996
GRT	: 4273
NRT	: 2910
Flag	: Singapore

Machinery

Cargo Oil Pumpsets:
2 x 600 m3/hr SPP 200/315 pump 10" discharge/suction driven by Detroil diesel engine 6V-71 160 hp 1500 rpm

Generating Sets:
2 x 75kw, 1500 rpm 415/3/50 Prime mover Detroit diesel 4-7in alternators Leroy Somer

Switchboard: Tarasaki

Air Compressors:
1 x 34 m3/hr 10 bar driven by motor 4kw 415/3/50 brand Ingersoll Rand

Bilge/Gas Pump: 2 x 80 m3/hr head 40m DESMI S100-80-220 A09 horizontal self-pressing pump c/w 30 hp x 2950 rpm sc/tefc motor 380/3/50 skid mounted

Fuel Oil Transfer Pump: 1 x 3 m3/hr head 20m ITUR RC-1 horizontal gear pump c/w 1.5 hp x 1420 rpm SC/TEFC motor 380/3/50 skid mounted

SW/FW Pressure Set:
2 x 3 m3/hr head 28m Myers HC2-75 ejector pump of 0.75 hp 220/1/50 c/w pressure control

Dirty Oil Transfer Pump: 1 x 3 m3/hr head 20m ITUR RC-1 horizontal gear pump c/w 1.5hp 1420 rpm motor 380/3/50 skid mounted

Sewage Transfer Pump:
1 x 5 m3/hr head 20m wangen 30st horizontal screw pump c/w 3hp x 950 rpm TEFC motor

Oily Water Separator:
1 x 1.0 m3/hr 15 ppm oil content

Aircon: 2 sets Hitachi watercooked package a/c unit 415/3/50 cooling capacity 277,800 btu/hr (23.15 ton)

Machinery (con't)

Deck Crane: 2 x PM hydraulic crane fitted amid ship one set each both sides

Outreach	Capacity
2.00 m	6500 kg — 14,000#
2.40 m	5200 kg
4.00 m	3290 kg
5.90 m	2170 kg
7.80 m	1555 kg
9.75 m	1155 kg
Slewing	360 Degree
Max Pressure	370 Bar
Pump Capacity	35 L/Min

Ventilation: 2 units Bifur type Hison fan model 435/2P/25 capacity 7990 m3/hr c/w explosion proof motor; 1 unit Axial flow fan model 760/4P/36 capacity 29030 m3/hr; 1 unit Hison fan model 760/4P/32 capacity 29030 m3/hr

Fire Fighting

CO2 Fixed Fire Fighting System:
One set co2 system c/w piping valves cylinders and all fittings as per BV and Solas approved

Fixed Deck Foam System:
One set fixed deck foam system c/w monitors and foam tank for protection of the cargo area

Fire Detection and Alarming:
Fire detection and alarm system fitted in engine room and accommodation in full compliance with BV and Solas rules.

Fire Pumps: 2 x 80 m3/hr head 40m c/w motor 30 hp x 2950 rpm 380/3/50

Fire Pumpset:
1 X 140 m3/hr head 70m Allen Gwyness driven by diesel engine PERKINS T-4.236

Portable Fire Extinguishers:
One set of portable fire extinguisher located in engine room, cargo area and accommodation space as per BV and Solas rules

Emergency Fire Pump: 1 x 30 m3/hr head 28m desmi S70-50-175 A09 horizontal self-priming c/w HATZ diesel engine type 1D61 10.5 kw/3600 rpm hand start with 50L fuel tank

Fire Fighting Appliance:
As per BV and Solas rules

Firemen's Outfit c/w Helmets & Boots:
2 sets as per BV and Solas rules

Particulars believed to be correct. Owners reserve their rights to amend specifications without notification.

SEA DIAMOND
60,000 BBL OIL STORAGE BARGE

Lifesaving and Appliances

Life raft	:	4 x 15 man inflatable life raft c/w hydraulic release and cradle
Lifebuoy c/w self-igniting light	:	4 pcs
Lifebuoy c/w self-igniting light and heavy lines	:	6 pcs
Life Jackets c/w lights and whistle	:	38 pcs
Line throwing apparatus c/w rockets	:	1 case
4-0 lifeline c/w snap hook	:	2 lengths
Safety hand lamp	:	2 pcs
Lifebuoy light c/w marine smoke signal	:	2 pcs
Self-igniting light	:	2 pcs
ALDIS signalling light c/w battery	:	1 set
First aid kit c/w accessories	:	1 set
Parachute distress rockets	:	12 pcs
Smoke signal	:	2 pcs

Accommodation

Capacity	:	30 persons
1-man room	:	10
4-man room	:	4
2-man room	:	2

Accommodation fully air-conditioned with recreation room on level 1 and exercise field on the top deck

Outfitting

Anchor winch	:	10T Anchor winch driven by diesel engine make Shanghai internal combustion engine works model 495AG 36kw 2000 rpm c/w G/B
Anchor	:	1 x 2T anchor c/w wire rope 220m x 32.5mm and anchor rack
Bollard	:	8 pcs 300mm dia double bit 600mm high
Panama Chocks	:	10 pcs
Towing Brackets	:	5 sets at bow
Navigations	:	One each port and starboard and one stern light
Fender	:	4 pcs Yokohama fender each 2.0m x 3.6m; 60 pcs heavy duty tyre fender each 1300mm x 45mm
Coating	:	International paint 5 year scheme exterior
Anodes	:	5 year scheme

Communications

SSB:
1 x Furono FS 1502 c/w transceiver unit 150w

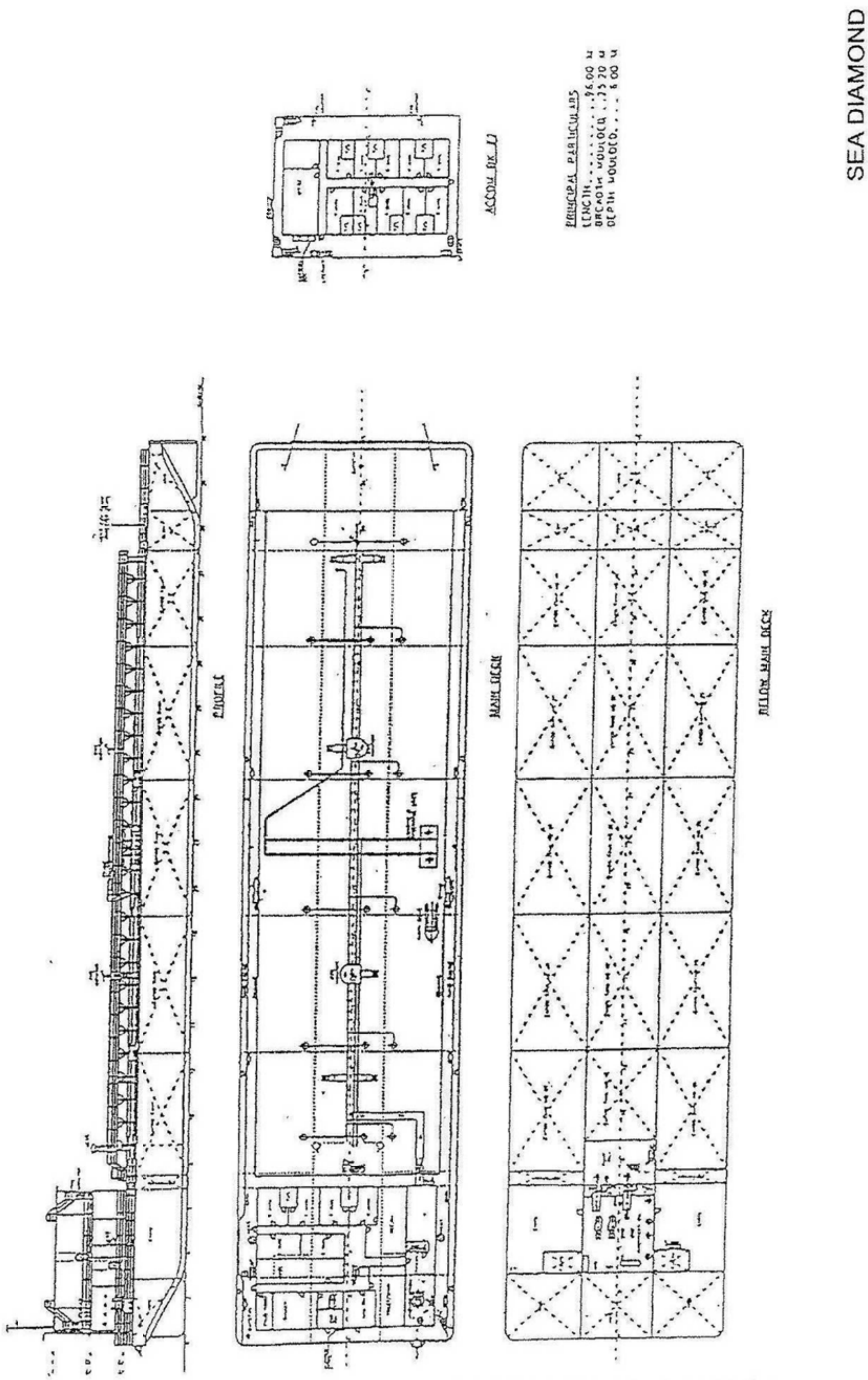
EPIRB:
2 x Mcmurdo c/w hydraulic release bracket

VHF radio telephone:
3 x two-way Motorola GP300, 136-162 MHz 5W & channels

Public address:
1 x vingtor VRC-N talkback/PA system

Battery:
2 x 200 AH battery fitted for radio communication

Particulars believed to be correct. Owners reserve their rights to amend specifications without notification.



Particulars believed to be correct. Owners reserve their rights to amend specifications without notification.

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APPENDIX B – Tug Maritime Raja Specifications

POSH

POSH Maritime Pte Ltd
No. 1 Kim Seng Promenade
#06-01, Great World City
Singapore 237994
Tel: (65) 6839 6500 Fax: (65) 6839 6511
Email: mktg_maritime@paccoffshore.com.sg
Website: www.posh.com.sg

MARITIME RAJA
3200 HP TWIN SCREW TUG

PRINCIPAL PARTICULARS

Year Built	2005
Classification	BV I*Hull*Mach Tug Unrestricted Navigation
Flag	Singapore
Official Number	391222
Call Sign	9V6668
GRT	476
NRT	142

DIMENSIONS

Length Overall	36.1m	118'
Length BP	32.75m	
Breadth Moulded	10.6m	35'
Depth Moulded	4.9m	
Draft Max	4.0m	13'
Clear Deck Space	14 x 9m	43' x 28'

TANK CAPACITIES

Fuel Capacity	400m3
Fresh Water	70m3

PERFORMANCE DATA

Bollard Pull	45 tons
Speed Free Running	Approx. 12 knots

MACHINERY & EQUIPMENT

Main Engines: 2 x Caterpillar 3512B producing 1597 mhp each @ 1600 rpm c/w 2 x Twin Disc 5600 reverse reduction gearboxes of 6.06 : 1 ratio

Towing Gear: Shipneeds hydraulic towing winch SMS-HTW/SD-30/70 remote control in W/H 30t line pulls @ 0 - 5 m/min. brake holding

Generator: Prime movers 2 x Cummins 6CT8.3-D (M). Alternators 2 x Stamford UCM274F output powers 2 x 100kw. Diesel driven 380/3/50 90mt. Drum wire capacity 700m x 44mm

MACHINERY & EQUIPMENT (cont'd)

Anchor Windlass: Shipneeds hydraulic anchor windlass SMS-HAW/GG-26 4.4mt @ 10m per minute

Anchors & Anchor Chain: 2 x 750kg stockless anchors. 2 x 220m 26mm U2, steel stud link chain

Anxilliary Equipment: GS pump, bilge pump, FW/SW pressure sets, sewage plant etc.

Propulsion: 2 solid bronze manganese propellers each 2200mm dia. 4 bladed Kaplan type in kort nozzles

Steering gears: Scandia electric hydraulic independent steering system, 2 x 3 tm torque, 35/35 degree coupled with autopilot system

Stern Roller: 2.8m x 1m dia. approx 150mt S.W.L

Towing Hook: 50t SWL local & remote release

Navigation System: As per latest Solas rules. Full GMDSS, main & secondary radars, gyro compass, autopilot, magnetic compass, speed log, GPS, radar transponder etc.

Air Compressors: 2 x 20 m3/hr 3Mpa power 5.5kw

Communication: As per latest Solas rules for Area 3 SSB, VHF, 2-way radio, weather fax, EPIRB, public address, intercom, sound power telephone, AIS, SART, etc.

Accommodation: Fully air conditioned for 14 men

EXTERNAL FIRE FIGHTING & OIL SPILL EQUIPMENT

Oily Water Separator: 0.5 m3/hr @ 2kg/cm2

Lifesaving & Fire Fighting Life rafts: 2 x 15 men as per latest Solas rules

Particulars believed to be correct. Owners reserve their rights to amend specifications without notification.

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APPENDIX C – EX-USS *CHEHALIS* OFFLOAD OPTIONS MATRIX WITH ASSOCIATED ESTIMATED COSTS MATRIX

Final State	**Option A** Military Divers/Vessels	**Option C** Military Divers/Commercial Vessels
State 1 (Mitigate Catastrophic Release) 98% Gasoline Removed 99+ % All Pumpable Diesel Removed Secure All Cargo Hatches, 20 Days	$575,461	$826,614

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APPENDIX D – EX-USS *CHEHALIS* RECOVERED PRODUCT DISPOSAL ALTERNATIVES WITH ASSOCIATED ESTIMATED COSTS

Method of Disposal	**Level of Cleanliness**	**Alternative C** Dracone/Commercial Vessels	**Alternative E** Barge/Tug Commercial
Method 2 **In-situ Burn, Thermal Oxidation** Tow to a controlled burn site in Pago Pago harbor	State 1	2,248,022	$3,876,546
Method 3 **Transport to a Reprocessing/Disposal Facility (Singapore)** Offload into a Certificated Vessel and Transport to a Viable Reprocessing/Disposal Facility	State 1	Not Feasible	$2,170,523

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APPENDIX E – COMBINED ESTIMATED COST FOR THE OFFLOAD AND DISPOSAL

Summary of Alternatives with Estimated Costs				
Offload Options	Estimated Cost	Disposal Method	Estimated Cost	Combined Estimated Cost
Military Divers Military Vessels	$575,461	Oil Storage Bladder Thermal Oxidation	$2,248,022	3,823,483
Military Divers Commercial Platforms	$826,614	Oil Storage Bladder Thermal Oxidation	$2,248,022	3,074,636
Military Divers Military Vessels	$575,461	Commercial Barge Thermal Oxidation	3,876,546	$4,452,007
Military Divers Commercial Platforms	$826,614	Commercial Barge Thermal Oxidation	3,876,546	$4,703,160
Military Divers Military Vessels	575,461	Commercial Barge Reprocessing Facility (Singapore)	2,170,523	2,745,984
Military Divers Commercial Platforms	$826,614	Commercial Barge Reprocessing Facility (Singapore)	2,170,523	2,997,137

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APPENDIX F – EX-USS *CHEHALIS*/TB *CAPELLA* FUEL TRANSFER/TERMINATION PLAN

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EX-USS *CHEHALIS*/TB *CAPELLA*
FUEL TRANSFER/TERMINATION PLAN
PAGO PAGO, AMERICAN SAMOA

25 March–15 April 2010

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OVERVIEW

The United States Coast Guard (USCG) and the U.S. Navy, with contracted support, will offload approximately 7,500 gallons of diesel fuel and 65,000 gallons of high lead gasoline from the Ex-*Chehalis* in Pago Pago, American Samoa, during the period 25 March–15 April 2010. The Ex-*Chehalis* is in 160 feet of water and contains diesel fuel in two tanks accessible from the shell plate by hot tapping. Gasoline is contained in two cargo tanks, B-8 and B-10. These tanks are accessible through the Rolling Watertight Hatches (RWTH). Pumping operations will utilize, air operated suction pumps located on a floating platform alongside the anchored recovery barge, Tank Barge *Capella*. Diving operations will be accomplished by Mobile Diving and Salvage Unit (MDSU) 1 divers from Honolulu, Hawaii. Air monitoring and pollution response operations will be performed or directed by the USCG Pacific Strike Team.

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SECTION I

TRANSFER PLAN

1-1.0 PRODUCT TO BE TRANSFERRED

- Generic or Chemical Name: Marine Diesel and 115/145 High Lead Aviation Fuel
- MSDS Information: Appendix B

1-2.0 TRANSFER PUMPING SYSTEM

- General Description: The transfer system will consist of one ATEX certified Wilden 2″, 125 psi pneumatic pump. The pump is located on a floating platform alongside of the TB *Capella* (refer to Appendix A for additional details of *Capella*). The supporting air compressor that supplies air to the pump will be located on the fuel pier. Fuel hoses are 2″, Goodyear plicord, internally bonded, pressure tested to 225# certified fuel hose with stainless steel crimp ferrules and locking camlock end fittings. In addition, the camlock fittings will be wire tied in the locked position. The hose will be externally bonded augmenting the internal bonding system. Gaskets and seals are Buna-N rubber, compatible with the above products.
- The primary fuel loading points on the TB *Capella* will be through the 2″ stripping ports as they are sized to match the loading hose assemblies. The stripping ports suction pipes extend to within 1/2″ of the tank sump minimizing free fall and the possibility of a static discharge environment associated with the free fall of product into a tank.
- Hose Line Diagram: Figure 1, Appendix C
- Emergency Pump Shutoff Diagram: Figure 2, Appendix C
- Declaration of Inspection, Appendix D

1-3.0 RIGGING TRANSFER HOSES

The suction hose and external bonding wire will be rigged from the tanks on the ex-USS *Chehalis* with hose floats and rise to the floating platform along a supporting down line. The supporting down line will have sufficient slack so as to ensure that the hose never becomes the tension member in the anchoring system. The pump discharge hose will be rigged from the floating platform up over the side of the barge to the designated cargo tank. Hose saddles will be used at transition points when coming up and over the barge. All fittings on the topside hoses will be wrapped in absorbent pads and containment tubs will be placed under connection points that are not within the containment perimeter of the barge itself as practicable as possible.

1-4.0 EXPECTED TRANSFER RATES

- Estimated 5-10 gpm at start up until initial water/fuel interfaces have been eliminated and the hose has been walked and checked for leaks/kinks.

- Estimated 30-35 gpm transfer rates for the movement of the product once the system is verified and the discharge end fitting is submerged in the product sump. **TRANSFER RATE IS NOT TO EXCEED 35 GPM AT ANY TIME DURING THE OPERATION.**

1-5.0 PREDICTING AND TRACKING HULL STRESS WITH INSTALLED LOAD COMPUTERS OR BY OTHER MEANS

With a maximum of 100,000 gallons of product and slops anticipated during the operation it is not anticipated that fuel transfer operations will impart any undue stress on the hull. The Tank Barge *Capella* Master will be responsible for the designation of cargo tanks for the product so as to maintain stability, seaworthiness and trim for the open ocean transit subsequent to the loading operation.

1-6.0 STARTUP PROCEDURES

Prior to the start of each pumping evolution all hoses and connections shall be “walked” and inspected by the Response Officer (RO), the SUPSALV Person-In-Charge (PIC) and the barge Tankerman. A SCUBA team or the ROV will inspect the underwater portion of the hose line. The SUPSALV PIC will complete the Declaration of Inspection (Appendix D) before each transfer of liquid cargo. A safety and transfer brief shall also be conducted. The PIC shall report to the RO that all pumping personnel are in place and give permission to transfer.

The RO shall conduct a communications check, ensure that all personnel are in place, and the PIC will give final approval for the transfer. Flow rates shall be per transfer section 1-4.0 of this plan.

A Bravo (red) signal flag will be hoisted on the USNS *Sioux*, the Tank Barge *Capella* and the fuel pier in accordance with publication 102 International Code of Signals.

1-7.0 TANK SEQUENCING (SHIFTING) PROCEDURES

It is anticipated that not more than three tanks on the barge will be utilized, one for recovered diesel, one for gasoline and one for slops. When the sampling manifold reveals high concentrations of water the PIC will shut down the pumping system and arrange the valves to direct the slops into the designated tanks. The PIC will ensure proper valve alignment prior to authorizing the pumping of fuel to resume. Pumps, hoses, and valves will be secured and capped if hose shifting is necessary on the tank barge.

1-8.0 BALLASTING AND BALLAST DISCHARGE

Tank Barge *Capella* does not have a ballasting system and no ballasting or ballast discharge is anticipated.

1-9.0 TANK STRIPPING

None for operations in Pago Pago.

1-10.0 TANK GAUGING

Tank Barge *Capella* is equipped with enclosed sounding system; a tank radar sounding system and a Bergen high level tank overfill alarm system. The barge Master and personnel will be responsible for tank monitoring and soundings.

1-11.0 GAS BUILDUP DETECTION

The Pacific Strike Team will conduct air monitoring. The product tanks are integrated into a centrally vented vapor recovery system stack. Plastic sheeting will be used to control vapors on any tank openings that are not integrated into the barge vapor control system.

1-12.0 MANNING

Manning of the pumping station, air compressor and sampling manifold will be comprised of GPC and Tank Barge *Capella* personnel with augmentation from MDSU divers as needed. Specific assignments will be designated prior to the commencement of pumping operations. Stations will be manned by a minimum of two personnel to allow for relief breaks.

Table 1. Manning

Personnel	Qual	CDL	EMT	Mobilization
Munoz	SSO		X	Safety Officer
	RO			Response Officer
EM1 Atkinson	RS			Response Supervisor
GPC/MDSU				Pump Operator
GPC/MDSU				Air Compressor Operator
USCG				Air Monitoring
				Air Monitoring
				Comms
Tank Barge				Master/Tankerman
Wayne Warfield				Person In Charge

1-13.0 COMMUNICATIONS

VHF intrinsically safe radios shall be used for communications between all parties, USCG, U.S. Navy, GPC, barge and local support personnel. Appropriate channels will be used for the primary frequency (81A) and the secondary frequency (83A). Visual communications will be maintained with the pump team and the barge at all times. Predesignated hand and audible signals will be agreed upon prior to commencing transfer. A communications plan shall be established per ISC-205-OS. **At any time communications are lost the transfer shall stop**.

Communications with the tugs will be maintained via VHF-FM Channel 16/22A. In the event that vessel motion control becomes an issue, communication will switch to 81A.

Bravo flag shall be hoisted during fuel transfers. Five or more short air horn blasts will identify an emergency and trigger the immediate shutdown of the pumping system.

Communications Schedule:

- Communications will be established and verified with all parties prior to pumping operations commencing.

- A regular OPS check will be performed every 30 minutes between the barge Tankerman and the PIC.

1-14.0 NORMAL AND EMERGENCY SHUTDOWN

Normal shutdown condition shall have a five minute notification prior to securing. Transfer rates will be slowed during the time frame to reduce sudden changes in hose pressure. Emergency pump shutdown condition shall exist when any member of the pumping operation or observers witness an unsafe condition including but is not limited to leaking hoses, personnel injury, fire, and electrical storms within 5 nm of the transfer. Emergency shutdown shall be communicated via primary radio communications, hands waving over the head, or continuous blasts on a horn. Emergency shutdown points are conspicuously signed "EMERGENCY PUMP SHUTDOWN" as shown in Appendix C, Figure 2. All shutdowns are of a 90 degree ball valve configuration which, when closed, terminates air flow to the pneumatic pump.

1-15.0 PROCEDURES FOR REPORTING DISCHARGES OF OIL OR HAZARDOUS MATERIALS INTO THE WATER

The Incident Commander will be notified of any discharge of oil or other hazardous material. He in turn will notify the National Response Center if required at:

- 800-424-8802

- 202-267-2675

1-16.0 FIREFIGHTING

The firefighting plan is composed of both land-based resources and water-based assets as follows:

a. **Land-based firefighting assets include the following:**
   1) **ASG fire departments:** Liaison with the local fire departments will be conducted on arrival in Pago Pago to brief them on the ex-USS *Chehalis* offload operation, the products expected to be encountered and the notional schedule of pumping operations. A copy of the MSDS for diesel and aviation gasoline will be provided. Emergency communications procedures for notifying the ASG fire departments will be established and posted on the barge and all operational sites. The ASG fire departments, both local and at the air field will be telephonically notified by the RO or his designated representative/alternate immediately prior to the commencement of pumping operation. Notification will include the product to be pumped, the expected duration of the pumping and any other pertinent information. On conclusion of each pumping evolution the RO will again notify the fire department that pumping operations have ceased for the day.
   2) **ASG fuel pier firefighting assets:** The firefighting capabilities at the ASG fuel pier are shown in Appendix C, Figure 3. All barge and pier personnel will be briefed on these assets and their activation procedures, including a familiarization walk through. In addition a 1 1/2″ fire hose will be run from the fuel pier out to the barge terminating in the vicinity of the pumping/manifold operational area. The hose is available for firefighting and “herding” of fuel on the water if necessary.

b. **Water-based firefighting assets include the following:**
   1) **T-ATF, USNS *Sioux*:** The USNS *Sioux* has fire monitors with foam capabilities. Prior to pumping operations the alarm system and monitors will be tested. Manning of these assets is a T-ATF crew responsibility.
   2) **Tug *El Lobo Grande II*:** The tug *El Lobo Grande* is equipped with two fire hose stations, one on the main deck forward and one on the port side wheel house. In addition the vessel carries 10 portable ABC extinguishers and two fireman suits (for additional details on the *El Lobo Grande II*, refer to Appendix A). Prior to departure for Pago Pago and again the prior to the commencement of pumping operation the tug will verify that the systems are fully operational. Manning of these assets is the responsibility of the *El Lobo Grande* crew.
   3) **Tank Barge *Capella*:** The Tank Barge *Capella* is equipped with USCG required portable firefighting systems. Tank Barge *Capella* carries 6 each 2.5 gallon AFFF USCG approved foam extinguishers and one handcart mounted #150 dry chemical extinguisher (for additional details on the *Capella*, refer to Appendix A). All barge personnel will be briefed and trained on these portable extinguishers prior to commencing pumping operations. In addition the 1 1/2″ fire hose from the ASG fuel pier will augment the barges organic capability. The Tank Barge *Capella* will have a tow bridle ready over the bow and positioned so as facilitate pickup by the tug *El Lobo Grande* in the event of an emergency requiring an expeditious movement away from the pier. Manning of the fire suppression assets aboard the Tank Barge *Capella* is the responsibility of the barge crew, the PIC and GPC/MDSU personnel working on the vessel.

c. **Fire stations:**
All fire stations will be manned during pumping operations. Each station will have a designated fire station team leader. Firefighting assets aboard the Tank Barge *Capella* are sized in accordance with USCG requirements, augmented by an extra #150 dry chemical extinguisher. These assets by design are limited in their capability. They are designated to extinguish small fires and provide protection for the crew to escape an engulfing fire situation. Primary firefighting response vests with the local ASG fire department.

1-17.0 WEATHER

NOAA and U.S. Navy weather information will be the primary weather information source. Routine weather forecast information will be relayed to the Incident Commander on a daily basis, augmented by immediate reports for severe weather. The most likely weather that could affect operations includes; high winds, tsunamis, and lightning strikes in the vicinity of Pago Pago.

a. **High Winds:** In the event of high wind warnings the Incident Commander will direct pumping operations to cease. Operational assets will secure for the anticipated weather. The tug *El Lobo Grande* will be positioned so as to assist the Tank Barge *Capella* ride out the ensuing frontal passage or if necessary get underway. The T-ATF will take precautionary measures as deemed appropriate by the Master or as directed by operational headquarters.

b. **Tsunamis:** In the event of a tsunami warning the decision to ride out the event in harbor or get underway will be dependent on factors such as time available before anticipated arrival and the anticipated effect expected in Pago Pago. In the event where inadequate warning times are available to conduct a planned response to a tsunami, personnel safety will be priority. Prior to evacuating the barge toward the high ground in the vicinity of the Governors house located across the street from the fuel pier, every effort will be made to secure the pump and topside hose valves.

c. **Thunder Storms/Lightening:** Pumping operations shall cease if thunder storms or lightening are present within 5 miles of the operational area.

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SECTION II

TERMINATION PLAN

2-1.0 DECISION CRITERIA FOR GETTING UNDERWAY

In the event that during the offloading operation it becomes necessary for the barge to get underway in an emergency, the pumping system will be shut down, valves closed and capped. Topside hoses will be secured on deck. Suction hose valves will be closed and the end capped, buoyed and dropped overboard. The tug *El Lobo Grande* will pick up the barge tow pendant at the bow, make fast and assist the barge in retrieving her anchor. On retrieval of the anchor the *El Lobo Grande* will tow the barge to the designated anchorage.

During non-emergency termination of operations, the hose lines will be flushed with seawater into the designated slops tank until clear water fills the system. This will be accomplished by the divers removing the suction line from the applicable tank and placing the system in uncontaminated seawater. The pump will be activated until no contaminated water is seen at the discharge end of the hose line. With divers assistance the hoses will be disconnected from the suction head and the down line and be retrieved aboard the barge.

2-2.0 HOSE DRAINING, DISCONNECTION, AND HANDLING

On conclusion of operations, seawater will be pumped through the hose system and collected in the slops tank aboard the Tank Barge *Capella*. Containment shall be in place any time a hose is disconnected. Hoses will be capped after being disconnected. Pumps and hoses from tanks will be wiped down during removal and placed in containers for simple decontamination.

2-3.0 BLANKING OF MANIFOLDS AND HOSES

Unused manifolds will remain blanked throughout the operation. Disconnected hoses will have their associated valves locked in the closed position and camlock end caps installed and the dogs wire tied.

2-4.0 PROCEDURES FOR GETTING UNDERWAY

Upon determining that the offload operation is complete all pumping and hose equipment will be flushed with seawater and the residue captured in the designated slops tank. Equipment will be stowed for return shipment either on the barge or in the commercial shipping containers. A hazardous cargo manifest will be prepared and receipted for by the barge captain.

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APPENDIX A – CAPELLA AND EL LOBO GRANDE II VESSEL SPECIFICATIONS

K-SEA

CAPELLA

Capacity:	81,751Barrels @ 98%
Service:	Unrestricted Service
Classification:	✠A1, Oil Tank Barge
Cargo:	Grage A and below, & NLS
Official Number:	1129491
Built:	Halter Marine Gulfport, MS 2002
Hailing Port:	Portland, OR
Gross Tonnage:	5,790 ITC
Net tonnage:	3,846 ITC
Deadweight Tonnage:	11,964 LT
Full Load Displacement:	13,824 LT SW

OPA-90 Compliant, U.S. Flag, Jones Act Qualified

Mooring equipment:

Bow:	Hydraulic Anchor Windlass 5,000 lb Anchor 720' 1 1/4" wire 2 - Gypsy Heads
Stern:	2 Hydraulic vertical capstains

Pollution Prevention:

- 1000' 20" harbor containment boom
- Skimming and emergency lightering system
- 16' Response skiff
- Bergen Tank Radar gauging system
- Bergen high level.overfill alarm system
- MMC closed tape gauging system

Dimensions:

Length:	332'
Beam:	74'
Depth:	25'
Loadline draft:	22' 1"
Loadline freeboard:	3' 11"
Light draft:	4' 6"
Tons per inch:	57.58
Freshwater allowance:	6 3/16"

Cargo System:

Cargo Tanks:	10
Systems:	2
Pumps:	2- Byron Jackson LS-12
Prime Movers:	2- CAT 3406C
Rate:	4,500 bph each

Other Data:

Tank coating:	National NC-600
Heating system:	None
Double sides:	Yes
Double bottom:	Yes
Hose cranes:	2
Manufacturer:	Elevating Boats Inc
Type:	40' fixed boom
Safe working load:	4,000 lb capacity
Vapor recovery:	Yes
Closed gauging:	Yes
Generator:	John Deere
Output:	40 KW
Fuel tank Capacity:	16,000 gal
Stern to center manifold:	157'
Bow to center manifold:	175'
Manifold to side shell:	15'
Stripping system:	2" cargo stripping system
Manifold Connections:	2 each side
Manifold connection size:	12"
Vapor Connection:	10"

K-SEA TRANSPORTATION LLC
2700 W. COMMODORE WAY
SEATTLE, WASHINGTON 98199
24 HOURS 206-443-9418
FAX 206-343-0424
PACOPS@K-SEA.COM

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APRIL 2008

El Lobo Grande II

IMO Number:	7802641
Official Number:	596941
Class:	ABS A-1 AMS Towing Serv. Cert. #7808358
Hailing Port:	Wilmington, DE
Call Sign:	WDA 9486
MMSI Number:	369181000
Builder:	McDermott Shipyards, Inc
Place Built:	Amelia, LA 1978 Hull No. 239
Year Built:	1978
Gross Tonnage:	199 (563 ITC)
Net Tonnage:	135 (168 ITC)
Dimensions:	
Length:	128' 6"
Beam:	36' 6"
Depth:	19'
Loadline Draft:	16' 1 3/4"
Air Draft @ LL:	50'
Height of Eye:	36'
Freshwater Allowance:	na
Single/Twin Screw:	Twin
Propellors:	5 Blade
Kort Nozzles:	none
Main Engines:	(2) EMD 16-645-E7
Horsepower:	5,750 (2 X 2,875 ea)
Reduction Gears:	Falk 3040MRVFC-E
Anchor Equipment:	
Manufacturer:	unknown
Chain size:	2"
Chain length:	9 shots

Generators:	(2) GM 6V-71
Output:	90kW
Tow winch:	
Single/Double Drum:	Double
Manufacturer:	Markey TDSDW-36-C-32
Engine:	GM 6-71
Tow Wire:	
Port Drum:	2 1/4" X 2,500
Starboard Drum:	2 1/4" X 2,500
Bollard Pull:	151,250 lbs
Fuel Capacity:	140,000 gals @ 98%
Lube Oil Capacity:	2,000 gals
Hydraulic Oil Capacity:	1351 gals
Potable Water Capacity:	10,000 gals
Ballast Capacity:	60,000 gals
Slop Tank:	2,000 gals
Maximum Crew Capacity:	9
Other Data:	"Orville Hook" barge retrieval system Radar: (1) Furuno FR1510 MKII (1) Furuno FR 8100D GPS: (1) Furuno GP-37 WAAS/DGPS (1) Trimble GPS VHF: (1) ICOM MC-M80 (1) SEA 156, (1) RAY-33 SSB: (1) SEA-330, (1) ICOM IC-M710 Autopilot: Sperry Cell Phone Satellite Comms: phone/e-mail Gyrocompass: Sperry MK 37 WeatherFax: Furuno DFAX Fathometer: (1) Ross (1) Furuno LS-6000

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Rev. January 2006

APPENDIX B – MSDS INFORMATION

Material Safety Data Sheet

Chevron Global Marine Products

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

DISTILLATE MARINE DIESEL (DMB)

Product Use: Fuel
Product Number(s): 32936
Synonyms: MARINE DIESEL OIL DMB
Company Identification
Chevron Marine Products LLC
1500 Louisiana Street
Houston, TX 77002
United States of America

Transportation Emergency Response
USA: CHEMTREC (800) 424-9300 or (703) 527-3887
Asia: +65 6883 1111
Health Emergency
Chevron Emergency Information Center: Emergency Information Centers are located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
Product Information
Product Information: USA: 832-854-6000
MSDS Requests: USA: 832-854-6000

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Fuel oil no. 4	68476-31-3	100 %weight

SECTION 3 HAZARDS IDENTIFICATION

****

EMERGENCY OVERVIEW

- COMBUSTIBLE LIQUID AND VAPOR
- MAY CAUSE LUNG DAMAGE IF SWALLOWED
- CAUSES SKIN IRRITATION
- SUSPECT CANCER HAZARD - MAY CAUSE CANCER
- TOXIC TO AQUATIC ORGANISMS. MAY CAUSE LONG-TERM ADVERSE EFFECTS IN THE AQUATIC ENVIRONMENT

****

IMMEDIATE HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Contact with the skin causes irritation. Contact with the skin is not expected to cause an allergic skin response. Symptoms may include pain, itching, discoloration, swelling, and blistering. Not expected

to be harmful to internal organs if absorbed through the skin.
Ingestion: Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death. May be irritating to mouth, throat, and stomach. Symptoms may include pain, nausea, vomiting, and diarrhea.
Inhalation: Not expected to be harmful if inhaled.

DELAYED OR OTHER HEALTH EFFECTS:
Cancer: Prolonged or repeated exposure to this material may cause cancer.
See Section 11 for additional information. Risk depends on duration and level of exposure.

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: Wash skin with water immediately and remove contaminated clothing and shoes. Get medical attention if any symptoms develop. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person. If swallowed, get medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.
Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.
Note to Physicians: Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

SECTION 5 FIRE FIGHTING MEASURES

See Section 7 for proper handling and storage.

FIRE CLASSIFICATION:
OSHA Classification (29 CFR 1910.1200): Combustible liquid.

NFPA RATINGS: Health: 1 Flammability: 2 Reactivity: 0

FLAMMABLE PROPERTIES:
Flashpoint: (Pensky-Martens Closed Cup) 61.5 °C (143 °F) Minimum
Autoignition: 263 °C (505 °F)
Flammability (Explosive) Limits (% by volume in air): Lower: No data available Upper: No data available

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO_2) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: Liquid evaporates and forms vapor (fumes) which can catch fire and burn with explosive force. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above 29C (85F).
Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Wash thoroughly after handling.
General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.
General Storage Information: DO NOT USE OR STORE near heat, sparks, flames, or hot surfaces . USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
Skin Protection: Wear protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted. Suggested materials for protective gloves include: Chlorinated Polyethylene (or Chlorosulfonated Polyethylene), Nitrile Rubber, Polyurethane, Viton.
Respiratory Protection: No respiratory protection is normally required.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.
Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
Fuel oil no. 4	ACGIH	100 mg/m3	--	--	Skin A3 total hydrocarbon

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Brown
Physical State: Liquid
Odor: Petroleum odor
pH: Not Applicable
Vapor Pressure: No data available
Vapor Density (Air = 1): No data available
Boiling Point: 160°C (320°F) - 450°C (842°F)
Solubility: Soluble in hydrocarbons; insoluble in water
Freezing Point: Not Applicable
Specific Gravity: <1 @ 15.6°C (60.1°F) / 15.6°C (60.1°F)
Density: 900 kg/m3 @ 15°C (59°F) (Max)
Viscosity: 11 mm2/s @ 40°C (104°F) Maximum

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS
Eye Irritation: The eye irritation hazard is based on evaluation of data for similar materials or product components.
Skin Irritation: The skin irritation hazard is based on evaluation of data for similar materials or product components.
Skin Sensitization: The skin sensitization hazard is based on evaluation of data for similar materials or

product components.
Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
This material is expected to be toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment.

ENVIRONMENTAL FATE
This material is not expected to be readily biodegradable. The biodegradability of this material is based on data for a similar material.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: GAS OIL, COMBUSTIBLE LIQUID, UN1202, III

IMO/IMDG Shipping Description: NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORTATION UNDER THE IMDG CODE

ICAO/IATA Shipping Description: NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORTATION UNDER ICAO

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES:

1. Immediate (Acute) Health Effects: YES
2. Delayed (Chronic) Health Effects: YES
3. Fire Hazard: YES
4. Sudden Release of Pressure Hazard: NO
5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK

02=NTP Carcinogen 06=NJ RTK
07=PA RTK

The following components of this material are found on the regulatory lists indicated.

Fuel oil no. 4 01-2B, 04, 07

CHEMICAL INVENTORIES:
All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), EINECS (European Union), TSCA (United States).

WHMIS CLASSIFICATION:
Class B, Division 3: Combustible Liquids
Class D, Division 2, Subdivision A: Very Toxic Material - Carcinogenicity
Class D, Division 2, Subdivision B: Toxic Material - Skin or Eye Irritation

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 1 Flammability: 2 Reactivity: 0

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

REVISION STATEMENT: This is a new Material Safety Data Sheet.
Revision Date: March 06, 2007

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	MSDS - Material Safety Data Sheet
CVX - Chevron	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Chevron Energy Technology Company, 100 Chevron Way, Richmond, California 94802.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date

hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

CPChem

Material Safety Data Sheet

115/145 AVIATION GASOLINE

March 31, 1993

MSDS #: 41440

CHEVRON PHILLIPS CHEMICAL COMPANY LP
1301 McKinney Street
Houston, Texas 77010-3030

PHONE NUMBERS
EMERGENCY: (800) 231-0623 or
(510) 231-0623 (International)
EMERGENCY RESPONSE (ASIA): 800-AlertSGS
or 800-25378477 or 65-542-9595
TRANSPORTATION (24 HR): CHEMTREC
(800)424-9300 OR (703)527-3887
Technical Services: (713) 289-4862
For Additional MSDSs: (800) 852-5530

A. Product Identification

Synonyms: 115/145 AVGAS; Aviation Check Fuel 115/145; Aviation Fuel
Chemical Name: Mixture
Chemical Family: Hydrocarbon
Chemical Formula: Mixture
CAS Reg. No.: Mixture
Product No.: MF2100

Product and/or Components Entered on EPA's TSCA Inventory: YES

This product is in U.S. commerce, and is listed in the Toxic Substances Control Act (TSCA) Inventory of Chemicals; hence, it may be subject to applicable TSCA provisions and restrictions.

B. Components

Ingredients	CAS Number	% By Wt.	OSHA PEL	ACGIH TLV
Tetraethyl lead	78-00-2	< 1	10 ppm**	10 ppm
Toluene	108-88-3	NE	100 ppm	100 ppm
Isooctane	26635-64-3	25	NE	NE
C7-C8 Isoparaffins	70024-92-9	11	NE	NE
Isopentane	78-78-4	10	NE	NE
n-Butane	106-97-8	3	800 ppm	800 ppm

* As lead, skin notation.
** Areas covered by the Benzene Standard, 29 CFR 1910.1028, will have a 1 ppm 8 hour TWA and 5 ppm STEL.

C. Personal Protection Information

Ventilation: Use adequate ventilation to control exposure below recommended levels.

Respiratory Protection: For concentrations exceeding the recommended exposure level, use NIOSH/MSHA approved air purifying respirator.

When entry into or exit from concentrations of unknown exposure, use NIOSH/MSHA approved self-contained breathing apparatus (SCBA).

Eye Protection: Use safety glasses with side shields and face shield for splash protection.

Skin Protection: Use gloves resistant to the materials being used (Viton, nitrile, neoprene). Use full-body, long sleeved garments to prevent skin contact.

NOTE: Personal protection information shown in Section C is based upon general information as to normal uses and conditions. Where special or unusual uses or conditions exist, it is suggested that the expert assistance of an industrial hygienist or other qualified professional be sought.

D. Handling and Storage Precautions

Do not get in eyes, on skin or on clothing. Do not breathe vapors, mist, fume or dust. Do not swallow. May be aspirated into lungs. Wear protective equipment and/or garments described in Section C if exposure conditions warrant. Wash thoroughly after handling. Use only with adequate ventilation. Launder contaminated clothing before reuse.

Keep away from heat, sparks, and flames. Store in a well-ventilated area. Store in tightly closed container. Bond and ground during transfer.

E. Reactivity Data

Stability: Stable
Conditions to Avoid: Not Applicable
Incompatibility (Materials to Avoid): Oxygen and strong oxidizing agents

Hazardous Polymerization: Will Not Occur
Conditions to Avoid: Not Applicable

Hazardous Decomposition Products: Carbon oxides, lead fumes and various hydrocarbons when burned.

F. Health Hazard Data

Recommended Exposure Limits:

See Section B.

Acute Effects of Overexposure:

Eye: May cause mild irritation, with stinging and redness of the eyes.

Skin: Minimize skin contact. Skin absorption of hazardous material may cause slight to moderate irritation. Repeated or prolonged contact may cause defatting of the skin, resulting in dermatitis. The dermal LD50 for aviation gasoline in rabbits is greater than 2 g/kg.

Inhalation: May cause headache, nausea, weakness, sedation, and unconsciousness. The inhalation LC50 for aviation gasoline in rats is greater than 89.67 mg/liter.

Ingestion: May cause irritation to intestines. If swallowed, may be aspirated resulting in inflammation and possible fluid accumulation in the lungs. The oral LD50 for aviation gasoline is greater than 5 g/kg.

Subchronic and Chronic Effects of Overexposure:

Unleaded gasoline has produced kidney cancer in male rats only. No comparable kidney disease is known to occur in humans.

Gasolines generally contain benzene which has been designated a carcinogen by the National Toxicology Program (NTP), the International Agency for Research on Cancer (IARC), and the Occupational Safety and Health Administration (OSHA). Benzene may produce blood changes which include reduced platelets, red blood cells, and white blood cells. Also, aplastic anemia, and acute nonlymphotic leukemia. Benzene has produced fetal death in laboratory animals and caused chromosome changes in humans and mutation changes in cells of other organisms.

Isopentane did not produce kidney damage in a subchronic oral laboratory study or in a subchronic inhalation exposure to 4500 ppm and 1000 ppm of a 50/50 mixture of isobutane and isopentane.

Exposure of pregnant rats during gestation to toluene at levels 250 ppm and higher produced some maternal toxicity and embryo/fetotoxicity. A lifetime inhalation study in rats did not show any toxic effects even at the high dose of 300 ppm.

Behavioural signs of hearing loss were observed in rats exposed to toluene subchronically at levels of 1000 ppm or more. Comparable effects have not been reported in humans.

Other Health Effects:

Combustion, a normal use of gasoline, results in an exhaust that has been associated with skin cancer in laboratory animals. Skin cancer was observed in these animals when exhaust was concentrated and repeatedly applied to the skin. It is unknown if this route of exposure is relevant to human exposure.

Combustion (burning) of most carbon-containing material forms carbon monoxide. Carbon monoxide inhalation may cause carboxyhemoglobinemia. Chronic exposure to carbon monoxide causes fatigue, poor memory, loss of sensation in fingers, visual disturbances and insomnia. Carboxyhemoglobinemia is frequently misdiagnosed as flu.

Sensitive sub-populations to the inhalation of carbon monoxide exist. Carbon monoxide displaces oxygen in the bloodstream and therefore, can adversely effect people with pre-existing heart disease, pregnant women and smokers.

Fuels containing lead anti-knock compounds should be handled in such a way to minimize contact with the body. Lead can accumulate in the body with overexposure and cause illness due to effects on the blood, nerves, kidneys and the reproductive system.

A Toxicity Study Summary for Aviation Gasoline is available upon request.

Health Hazard Categories:

	Animal	Human		Animal	Human
Known Carcinogen	X	X	Toxic		
Suspect Carcinogen			Corrosive		
Mutagen	X		Irritant		
Teratogen			Target Organ Toxin	X	X
Allergic Sensitizer			Specify - Blood Toxin; Reproductive Toxin-Embryo/Fetotoxin; Lung-Aspiration Hazard		
Highly Toxic					

First Aid and Emergency Procedures:

Eye: Flush eyes with running water for at least fifteen minutes. If irritation or adverse symptoms develop, seek medical attention.

Skin: Wash skin with soap and water for at least fifteen minutes. If irritation or adverse symptoms develop, seek medical attention.

Inhalation: Remove from exposure. If breathing is difficult, give oxygen. If breathing ceases, administer artificial respiration followed by oxygen. Seek immediate medical attention.

Ingestion: Do not induce vomiting. Seek immediate medical attention.

Note to Physician: Gastric lavage using a cuffed endotracheal tube may be performed at your discretion.

G. Physical Data

Appearance:	Purple liquid
Odor:	Mild
Boiling Point:	95-338F (35-170C)
Vapor Pressure:	5.5 - 7.0 psia @ 100F (38C)
Vapor Density (Air = 1):	3-4
Solubility in Water:	Negligible
Specific Gravity (H2O = 1):	0.70 - 0.71 @ 60/60F (16/16C)
Percent Volatile by Volume:	100
Evaporation Rate (Butyl Acetate = 1):	> 1
Viscosity:	Not Established

H. Fire and Explosion Data

Flash Point (Method Used):	<-35F (-37C) (Estimated)
Flammable Limits (% by Volume in Air):	LEL - 1.5 UEL - 7.6
Fire Extinguishing Media:	Dry chemical, foam or carbon dioxide (CO2)
Special Fire Fighting Procedures:	Evacuate area of all unnecessary personnel. Wear appropriate safety equipment for fire conditions including NIOSH/MSHA self-contained breathing apparatus (SCBA). Shut off source, if possible. Water fog or spray may be used to cool exposed containers and equipment. Do not spray water directly on fire - product will float and could be reignited on surface of water.
Fire and Explosion Hazards:	Carbon oxides and various hydrocarbons formed when burned. Gasolines containing Tetraethyl Lead will form lead fumes when burning. Highly flammable vapors which are heavier than air may accumulate in low areas and/or spread along ground away from handling site. Flashback along vapor trail may occur.

I. Spill, Leak and Disposal Procedures

Precautions Required if Material is Released or Spilled:
Evacuate area of all unnecessary personnel. Wear protective equipment and/or garments described in Section C if exposure conditions warrant. Shut off source, if possible and contain spill. Protect from ignition. Keep out of water sources and sewers. Absorb in dry, inert material. Transfer to disposal drums using non-sparking equipment.

Waste Disposal (Insure Conformity with all Applicable Disposal Regulations):
Incinerate or otherwise manage in a RCRA permitted waste management facility.

J. DOT Transportation

Shipping Name:	Gasoline
Hazard Class:	3 (Flammable liquid)
ID Number:	UN 1203
Packing Group:	II
Marking:	Gasoline, UN 1203, Marine Pollutant (Gasoline, leaded)*
Label:	Flammable liquid
Placard:	Flammable/1203
Hazardous Substance/RQ:	Not applicable
Shipping Description:	Gasoline, 3 (Flammable liquid), UN 1203, PG II, Marine Pollutant (Gasoline, leaded)*
Packaging References:	49 CFR 173.150, 173.202, 173.242

* Marine pollutant mark and shipping paper notation required for all bulk domestic shipments and for non-bulk shipments by water.

K. RCRA Classification - Unadulterated Product as a Waste

Ignitable (D001)

Prior to disposal, consult your environmental contact to determine if TCLP (Toxicity Characteristic Leaching Procedure, EPA Test Method 1311) is required. Reference 40 CFR Part 261.

L. Protection Required for Work on Contaminated Equipment

Contact immediate supervisor for specific instructions before work is initiated. Wear protective equipment and/or garments described in Section C if exposure conditions warrant.

M. Hazard Classification

_X_ This product meets the following hazard definition(s) as defined by the Occupational Safety and Health Hazard Communication Standard (29 CFR Section 1910.1200):

___ Combustible Liquid	___ Flammable Aerosol	___ Oxidizer
___ Compressed Gas	___ Explosive	___ Pyrophoric
___ Flammable Gas	_X_ Health Hazard (Section F)	___ Unstable
_X_ Flammable Liquid	___ Organic Peroxide	___ Water Reactive
___ Flammable Solid		

___ Based on information presently available, this product does not meet any of the hazard definitions of 29 CFR Section 1910.1200.

N. Additional Comments

SARA 313

This product contains the following chemical or chemicals subject to the reporting requirements of Section 313 of T
itle III of the
Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. (See Section B).

Benzene
Toluene

APPENDIX C – DIAGRAMS AND FUEL DOCK LAYOUT

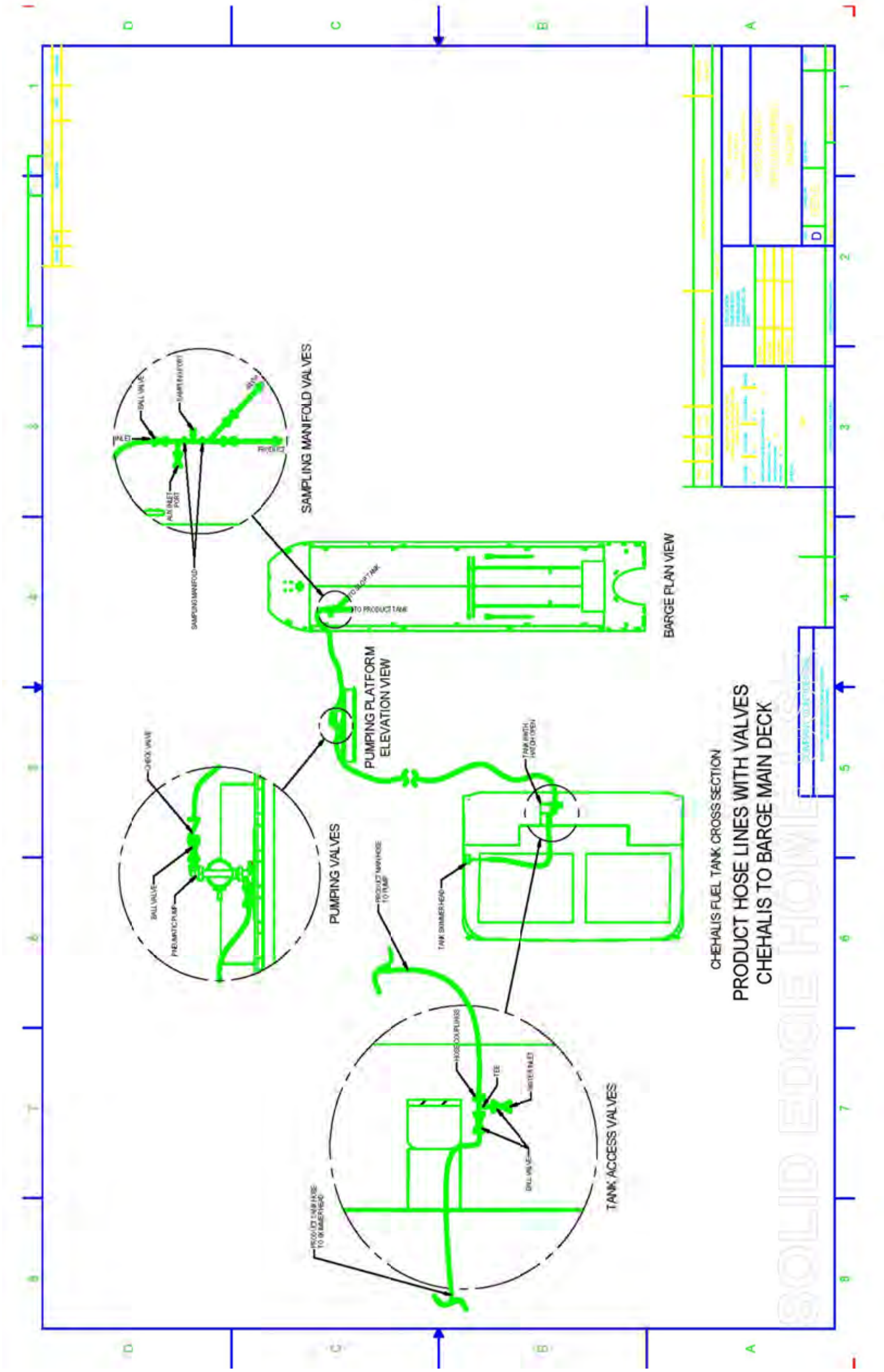

Figure 1. Hose Line Diagram

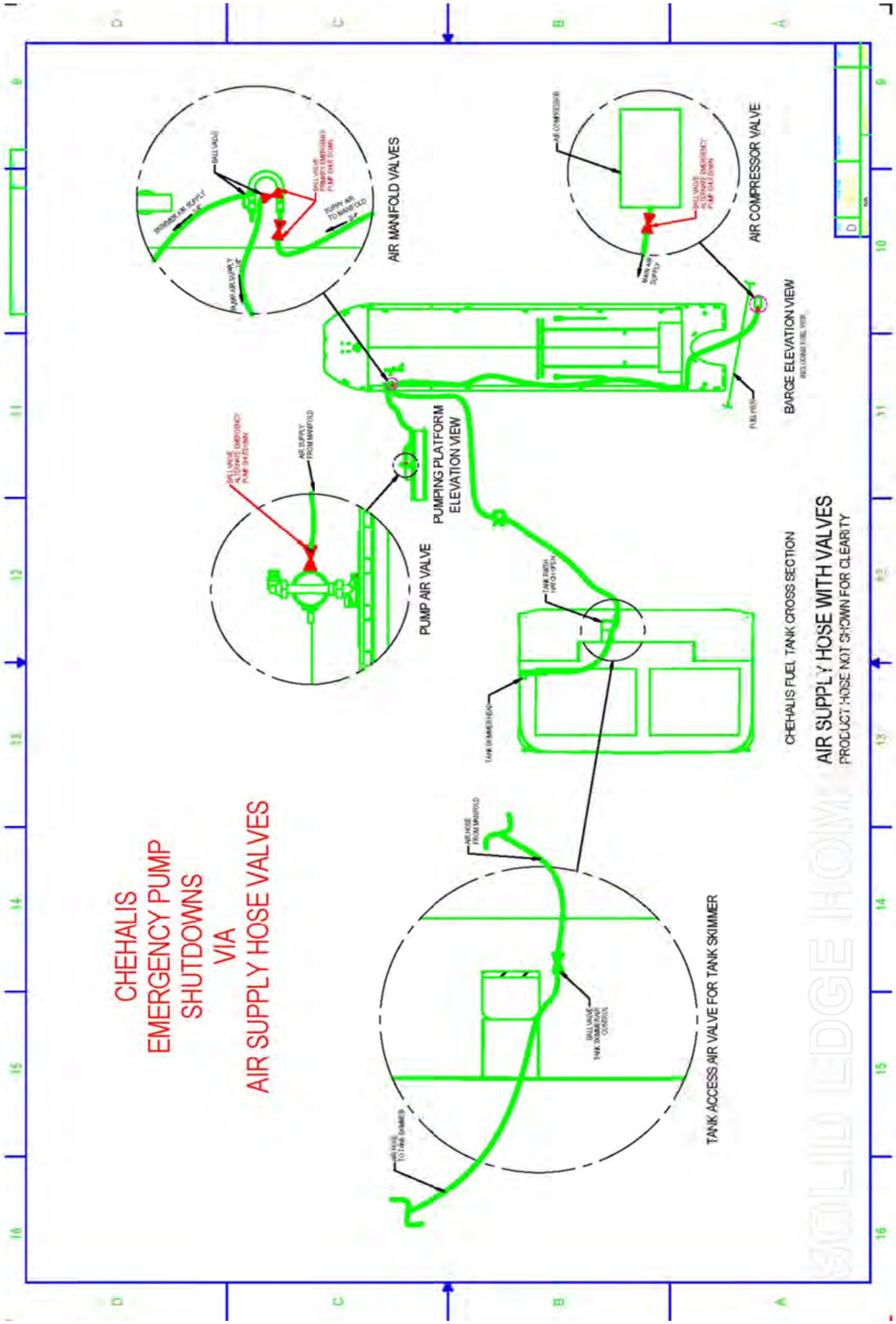

Figure 2. Emergency Pump Shutoff Diagram

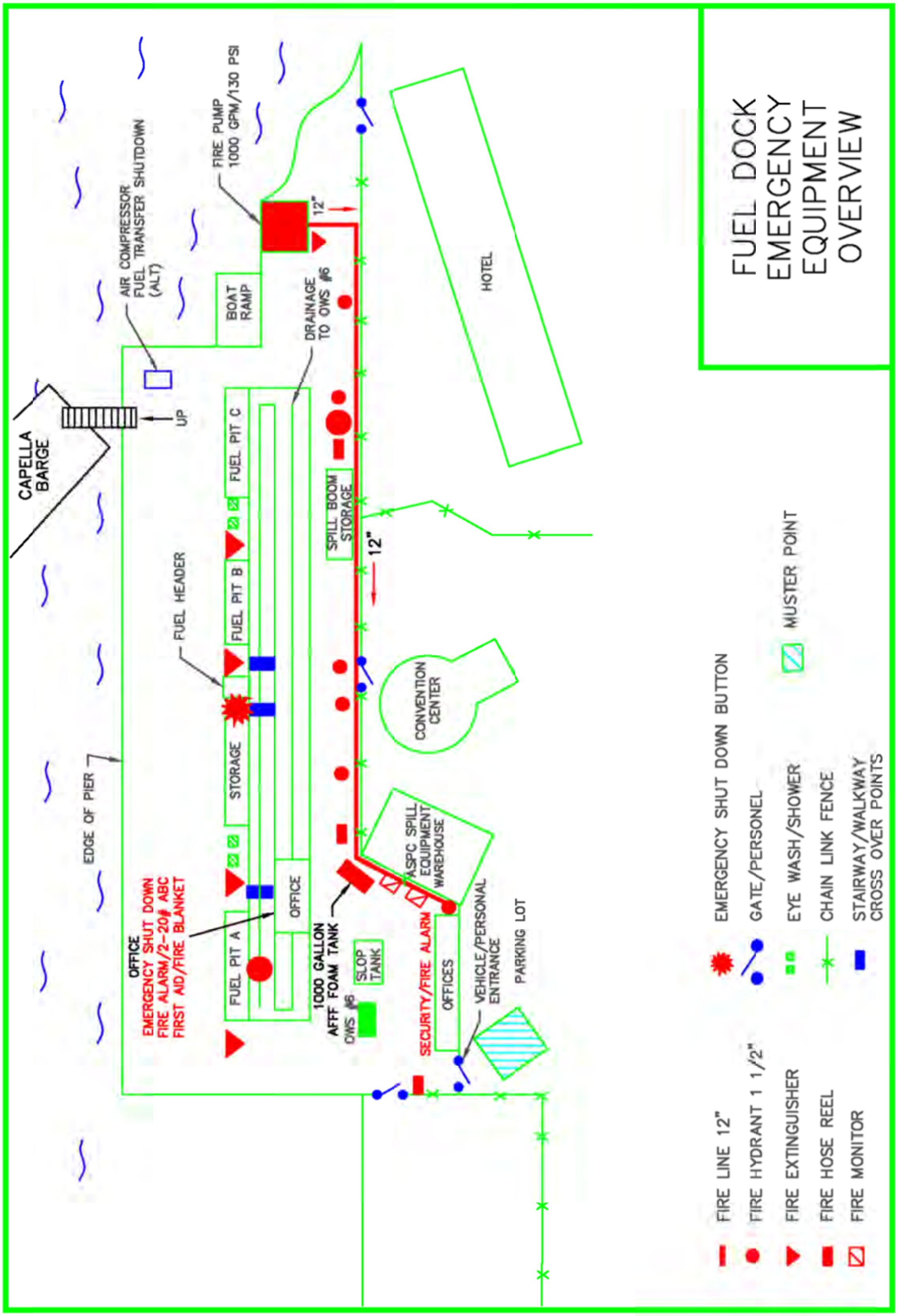

Figure 3. Fuel Dock Layout

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APPENDIX D – DECLARATION OF INSPECTION

DECLARATION OF INSPECTION Before Transfer of Liquid Cargo in Bulk (Incorporates requirements of 33 CFR 156.120 & 150; 46 CFR 35.35-30)

Transferring Vessel/Facility Name:	Receiving Vessel/Facility Name:	
Transfer Location (Port-Berth/Facility/Coordinates)	Date/Time Transfer Started:	Date/Time Transfer Completed:

PIC's shall verify by inspection and indicate by initialing that their vessel or facility meets the following requirements:

Vessel — Facility / Vessel

A. The mooring lines are strong enough and long enough for all expected conditions
B. Transfer hose and/or loading arms are long enough for intended use without strain from vessel movement
C. Transfer hoses are supported to prevent damage to the hoses and undue strain on the couplings
D. The transfer system is properly lined up for discharging or receiving oil or hazardous material
E. Each part of the transfer system not being used during the transfer operation is securely blanked off or shut off
F. Each hose or loading arm end not connected for transfer operation is blanked off using acceptable closure devices
G. The transfer system is attached to a fixed connection on the vessel and the facility
H. Each transfer hose is free from bulges and soft spots, or gouges and cuts that penetrate the 1st layer of reinforcement
I. Each transfer hose and loading arm meets the design and marking requirements
J. Each connection is of an approved design and meets the gasket, and bolting requirements
K. Required overfill protection devices or other monitoring devices are installed and operation properly
L. Required discharge containment equipment is readily assessable or deployed
M. Required discharge containments have been provided for couplings and are drained as necessary
N. All scuppers or other drains are closed or plugged
O. All connections in the transfer system are leak free except for permissible drippage
P. A communication system is provided between the facility and vessel and is operable
Q. An emergency shut down system is available and operable
R. Required PIC's are on duty at the transferring and receiving stations
S. Each PIC is on site, has an Operations/Transfer Manual available and controls transfers in accordance with it
T. Other personnel as required by Operations/Transfer Manual available and perform prescribed duties
U. At least one person is present who fluently speaks the language(s) of both PIC's
V. Persons in charge have held a conference to ensure that the mutual understanding of the following transfer operations
1. The identity of the product(s) to be transferred---enter below
2. Sequence of transfer

Product	1)	2)	3)	4)
GPM				

3. Transfer rate of flow
4. Name or title and location of each person participating in the transfer operation
5. Details of the transferring and receiving systems including procedures to ensure that MAWP's aren't exceeded
6. Critical stages of the transfer operation such as start up, tank switches and topping off
7. Federal, state and local rules that apply to the transfer of oil or hazardous materials
8. Emergency procedures
9. Discharge containment and reporting procedures
10. Watch or shift arrangements
11. Transfer shutdown procedures
12. An agreed-upon frequency of radios are used

W. Between sunset and sunrise adequate lighting of the transfer connection points and work areas is provided
X. If smoking is permitted in the marine transfer area, it will only be allowed in designated locations
Y. A *Vapor Recovery Appendix* is attached if the transfer includes collection ashore of vessel cargo tank vapors

The following requirements shall be verified by inspection and initialed by vessel PIC only

1. Required warning signs and red warning signals are displayed
2. No welding or hot work, and no unauthorized repair work in cargo spaces, is being conducted
3. No fires or open flames are present on deck or in compartments on the deck on which cargo connections are made
4. Boiler and galley fires are safe are safe to light during transfers of Grade A, B, or C cargoes or have been extinguished
5. A determination has been made regarding smoking off of weather decks during transfers of Grade A, B, or C cargoes
6. The overboard or sea suction valves are sealed or lashed in the closed position
7. If cargo-tank inerting is required, the system is maintaining an inert atmosphere in the cargo tanks
8. Applicable sections of the vessel response plan have been reviewed and initial response resources are available

The undersigned person in charge of the liquid cargo in bulk about to begin or continue, do certify that I have personally inspected this vessel or facility, as appropriate, with reference to the above listed requirements, and that opposite each of the applicable items list I have indicated by initialing that the vessel/facility complies with all pertinent regulations and that I agree to begin/continue the transfer operation.

Vessel Person in Charge			Facility/Vessel Person in Charge		
Signature	Date	Time	Signature	Date	Time
Signature	Date	Time	Signature	Date	Time
Signature	Date	Time	Signature	Date	Time

Retain this Declaration of Inspection for at least one month (Revised 1/10)

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APPENDIX E – SPILL RESPONSE PLAN

Ex-CHEHALIS

Spill Response Plan

1. General Information
   a) Response Priorities
      i) Protecting the safety and health of responders and the public.
      ii) Reducing the impact to the environment
      iii) Protecting Property
2. Notification Procedures
   a) Any discharge of oil or other hazardous material will be reported by the National Response Center:

      800-424-8802

      202-267-2675
   b) Reports will also be made to the FOSC and to the COTP via MSD American Samoa personnel.
   c) The following notifications will made as operationally required.
      i) Fire Department -
      ii) Fuel Dock -
      iii) Container Dock -
      iv) Harbor Master –
      v) Police Department-
3. Communications
   a) In the event that a spill or potential spill situation is identified it will be communicated via radio to the Response Officer and the Person In Charge.
   b) The emergency signal for a spill incident will be five or more bursts of an air horn.
4. Spill Mitigation Procedures
   a) During active pumping operations the base of the fuel pier will be boomed off to prevent any possible spilled product and its flammable vapors from accumulating underneath the fuel pier.

b) Pier side fire hoses may also be used to herd the spill away from the fuel dock structures.

c) Additional harbor boom will be available at the container dock should it become necessary for other areas to be excluded or boomed off.

d) During the "tapping" of the diesel tanks as further explained in the transfer plan it is possible for small quantities of diesel to seep out from the hot tap. Those spills will be dealt with depending on the quantity and environmental conditions.

e) Due to the volatility of the AVGAS no efforts will be made to ***contain*** or ***recover*** any spilled AVGAS.

f) The AVGAS is expected to evaporate and disperse within three hours or less depending on wind conditions. Diesel would persist relatively longer, with 15% or less remaining after 48 hours, depending on wind conditions. See ADIOS results below:

AVGAS ADIOS Results

Percent remaining of 70,000 gallons spill after

Wind Speed	1hr	2hr	3hr
5 knots	40%	1%	< 1%
10 knots	23%	<1%	
15 knots	26%	<1%	

g) In the event that Diesel is spilled response actions will be determined based on the amount of product spilled. Pacific Strike Team personnel already on site will coordinate with Marine Safety Detachment personnel and Solar Inc as required.

5. Shore-Based Response Activities

   a) In the event of a spill ***ALL*** transfer/pumping operations will be secured until the source of the spill has been identified and corrected.

   b) Transfer/Pumping operations will only resume when the Response Officer and the barge's Person In Charge are in agreement that it is safe to resume the operation.

6. List of Contacts

   a) Captain of the Port – Sector Honolulu: 808-

   b) Marine Safety Detachment – American Samoa:

   c) Solar Inc:

APPENDIX G – EX-USS *CHEHALIS* AOG-48 SITE SAFETY PLAN

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GPC, a Joint Venture

SITE SAFETY PLAN

AOG-48 USS Chehalis

SITE LOCATION: American Samoa

25 March–18 April 2010

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PREFACE

HAZWOPER (29 CFR 1910.120)

This regulation mandates that all employees who will be working on a site containing hazardous substances must undergo training.

The type of training required depends on the type of tasks the worker performs and the likelihood of exposure. The regulation covers several distinct groups of workers:

1. General site workers engaged in activities that expose or potentially expose them to hazardous substances are required to undergo at least 40 hours of off-site training and at least three days of field experience under a trained supervisor.

2. Workers who are on site only occasionally and who are unlikely to be exposed over permissible exposure limits (PEL) are required to receive a minimum of 24 hours of off-site instruction and at least one day of supervised instruction on site.

3. Workers regularly on site who work in areas that have been supervised and have exposure limits that are under permissible limits are required to receive a minimum of 24 hours of off-site instruction and at least one day of supervised field instruction.

4. Management and supervisory personnel who are responsible for employees working with hazardous materials must receive 40 hours of initial training, three days of supervised field training, and at least eight hours of training specific to their job assignments.

After fulfilling the initial training requirements, general site workers and supervisory personnel are required to undergo annual refresher training according to 29 CFR 1910.120.

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APPENDIX G – SITE SAFETY PLAN
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LIST OF APPENDICES

LIST OF FIGURES

GPC
SITE SAFETY WORKSHEET **Date:** March 2009

Key Personnel	
Program/Project Manager: Ron Worthington	
Operations Supervisor: Paul Schadow	
Oil Transfer Operations Person-in-Charge: Wayne Warfield	
Shore Work Party Supervisor: Ron Worthington	
Water Operations Supervisor: Ron Worthington	
Health and Safety Supervisor:	
Site 1 Safety Monitor: Craig Moffatt	Site 4 Safety Monitor:
Site 2 Safety Monitor:	Site 5 Safety Monitor:
Site 3 Safety Monitor:	Site 6 Safety Monitor:

Site Description	
Location:	American Samoa Pago Pago
Hazards:	Volatile liquids, flammable liquids-Fire hazard, Lead exposure, Benzene, Toluene exposure, water hazards, falling hazards, Over head work, Pressurized vessel hazards, Vector Transmissible Diseases e.g., (Dengue Fever, Malaria), Water or Food Bourne viruses e.g.. (Typhoid, salmonella dysentery, Hepatitis), Heat Stroke Or Heat Exhaustion.
Surrounding Population:	Pago Pago
Applicable MSDS	1. Aviation Gasoline 115/145. 2. Distillate Marine Diesel (DMB) 3. Bottled Oxygen.

Weather	
Conditions:	Temps 80’s to high 90’s. Humidity High. Typhoon not in season.
Wind:	Winds expected 0-10 knots. Average
Temperature:	High ambient temperatures with high humidity
Water Conditions:	Warm, estimate 80 degrees.

Communications	
Primary VHF Channel:	81A
Alternate VHF Channel:	83
See Incident Communications Plan, ICS Form 205	

Telephones	
Project Manager’s Telephone number	TBD
Asst. Project Manager’s Telephone number	TBD
Fuel Transfer Person-in-Charge: Wayne Warfield	(631) 255-9088
ICS Safety Officer: EM1 Brian Atkison	(415) 286-1675

Medical Assistance	
Nearest Medical Facility:	LBJ Tropical Medical Center
Medical Facility’s Telephone	684 633-4539
Location/Address:	Faga'alu, American Samoa

1. Site Safety Meetings

Note: Due to the inherent hazards of the product on board the subject vessel, the operations and safety meetings will be integrated. **Safety and shift supervisors will hold site safety meetings before a shift or beginning a new work assignment. At a minimum, these meetings will describe the work to be accomplished, discuss any safety procedure changes, and discuss hazards.**

2. **Safe Oil Transfer Procedures**

The EX-USS *CHEHALIS/*T/B *CAPELLA* FUEL TRANSFER/TERMINATION PLAN and Appendices A – Oil Transfer Procedures Manual and B – Declaration of Inspection (DOI) will be strictly followed prior to and throughout any oil transfer operations. The designated Person-in-Charge will conduct a Pre-Transfer Conference for all persons involved and complete the Declaration of Inspection prior to any commencement of oil/fuel transfer.

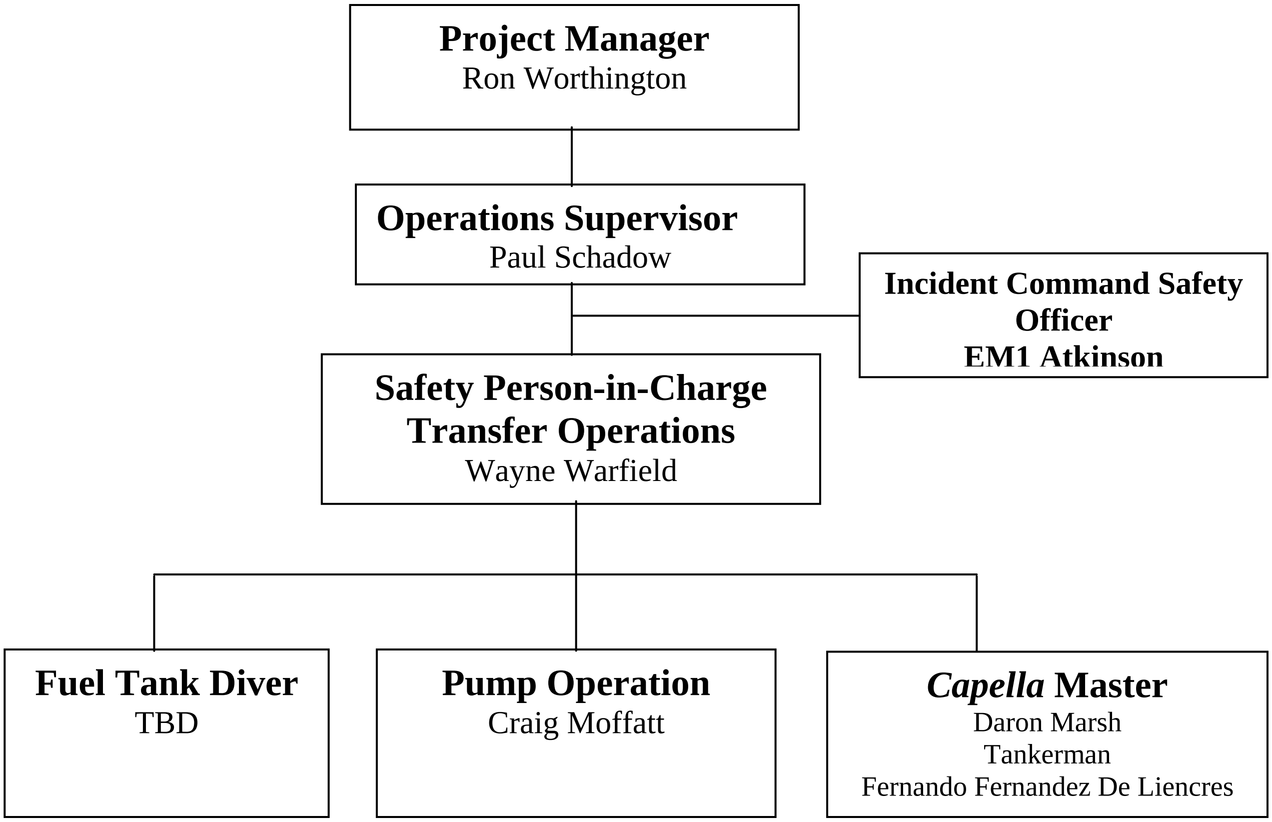

Figure 2-1 Safe Fuel Transfer Operations Organization Chart

a. **The responsibilities of the Safety Person-in-Charge include, but are not limited to:**
1) Coordinating the implementation of this plan.
2) Organize and chair the Pre-Transfer Conference
3) Personally supervise connections, valve and system alignments, loading, topping off, disconnecting, and all other critical transfer procedures.
4) Personally instruct all other persons on duty when to start the flow of oil to the vessel.
5) Personally supervise preparation of the barge for the acceptance of cargo.
6) Confer with the PIC of the other facility or vessel to ensure that each understands how to work together during the transfer operation.
7) Conduct an inspection and complete the Declaration of Inspection prior to the commencement of transfer.
8) Monitor the transfer hoses, connectors and adaptor fittings, pump, and tanks being loaded, including taking soundings and maintaining visual observations of the transfer hose(s) and connection(s) to the tank(s).
9) Advise all concerned of unusual conditions.
10) Insure OSHA compliance in all activities involving on-scene supervisors and workers. All personnel working on the pump float and on Tank Barge *Capella* are required to wear all required personal protective equipment during oil transfer operations
11) Assist in updating this Safety Plan as required by the Project Manager and supervisors.
12) Liaison among the Site Safety Supervisors from other organizations.

The following are highlights of a general Safety Overview:

General:
- Establish Chain of command for transfer.
- Use only intrinsically safe radios.
- Uses only spark free tools, rubber /brass hammers & brass/bronze wrenches.
- Grounding cable between discharge vessel & pump, pump and receiving vessel manifold as well as air compressor on dock to control station and control station to pump.
- ANSI flange adapter if used will have proper gasket and a bolt in every hole.
- Fire extinguishers to be standing by at manifold.
- No smoking (except in designated areas only.
- Fill out attached DOI and follow accordingly.
- Comply in addition with Charter vessel and dock safety regulations.
- Proper PPE to be worn at all times as listed:
  - Safety glasses at all times.
  - Steel toe shoes with chemical resistant soles at all times
  - Hard hats during crane operations.
  - PFD’s to be worn o/b all RHIBS/small work boats, on floating pump platform, when outside barge safety rails, and while working on dock handling mooring lines etc.
  - Face shield and rubber gloves to be worn during sampling.
  - In the event of an oil spill, responders will wear appropriate PPE in addition to the above, to include Tyvek coveralls, gloves, rubber boots, and respirators as determined by USCG installed air monitoring systems.

3. Emergency Procedures

Appendix C **–** K-Sea Emergency Response Guidebook addresses procedures for responding to a vessel oil spill and fires. The Pre-Transfer Conference will also address these and other emergency procedures.

3.1 Normal and Emergency Shutdown

Normal shutdown condition shall have a five minute notification prior to securing. Transfer rates will be slowed during the time frame to reduce sudden changes in hose pressure. Emergency pump shutdown condition shall exist when any member of the pumping operation or observers witness an unsafe condition including but is not limited to leaking hoses, personnel injury, fire, and electrical storms within 5 nm of the transfer. **Emergency shutdown shall be communicated via primary radio communications, hands waving over the head, or continuous blasts on a horn. Emergency shutdown points are conspicuously signed** "EMERGENCY PUMP SHUTDOWN" **as shown in Appendix F, Figure 2. All shutdowns are of a 90 degree ball valve configuration which, when closed, terminates air flow to the pneumatic pump.**

3.2 K-Sea Vessel Emergency Response and Communications Procedures

Appendix C **–** K-Sea Emergency Response Guidebook addresses emergency procedures for various vessel casualty and security situations. All on-site personnel should be aware of these procedures that the Master and crew of tug *El Lobo Grande* and Tank Barge *Capella* will follow in the event of an emergency and provide assistance as may be necessary. Additionally, the K-Sea Master and crew will implement Vessel Emergency Response and Communications Procedures. These emergency response and communication procedures take into account the various types of emergencies which may arise on a K-Sea vessel. They provide guidance to both vessel and shore-based personnel regarding safety and environmental issues, hazards, accidents and emergency situations.

3.2.1 Responsibilities

Vessel Masters are responsible for ensuring that an efficient and rapid response is conducted if the vessel under his command is involved in an incident or hazardous occurrence. Masters shall act in accordance with relevant emergency response and communication procedures.
It is the responsibility of every K-Sea Transportation, Pacific Division employee to comply with these emergency response and communication procedures.

- **Vessel crewmembers** shall report emergency situations to the Watch Officer and/or Master, and shall follow emergency response procedures under the direction of the Master or designated representative.
- **The Watch Officer** shall notify the Master of emergency situations and follow response procedures under the direction of the Master.
- **The Master** shall report all emergency situations to the Duty Operations Manager who will assist in coordinating required notifications. The Master shall be the initial on-scene commander directing onboard activities during the emergency.

- **The Duty Operations Manager** shall notify the appropriate individuals based on the Company Emergency Call Procedures.
- In addition, the Duty Ops Manager shall ensure emergency response plans have been implemented and coordinate drug testing with HR if required.
- **Senior Management** shall notify the necessary risk manager(s) and corporate representative(s), if applicable, and direct onshore activities during the emergency.
- In the event of an emergency or casualty to a K-Sea Transportation vessel carrying customer cargo, a member of Senior Management is responsible for notification of the affected customer. This notification must be made promptly to the customer's emergency notification number identified in the voyage orders, charter party agreement, contract of affreightment, or customer's operations guide as appropriate.
- **Operations and Engineering Managers** shall assist in troubleshooting and damage control and coordinate needed repairs.

3.2.2 Station Bills

The Safety Manager is responsible for preparing Station Bills in accordance with applicable regulation and a separate Spill Response Station Bill containing guidance for responsibilities during tug or barge spills. The Master is responsible for posting station bills at required locations and ensuring all crewmembers are familiar with response information and duties.

3.2.3 Muster Stations

Muster Stations on K-Sea Transportation, Pacific Division vessels are as follows:

- **Tug Muster Station** Tug wheelhouse, if safe, or tug aft weather deck—as directed by vessel Master (see Appendix H).
- **Barge Muster Station** Upwind from the spill in a safe location as directed by the Lead Tankerman.

3.3 Emergency Response Procedures

Company response guidelines are documented in the Appendix C -*Emergency Response Guidebook*. The *Emergency Response Guidebook* is a standalone document that details emergency response actions. This guidebook can be utilized during drills, training and actual emergency events.
A particular response depends on a variety of factors unique to the situation. Response personnel should use common sense, prudent seamanship, availability of resources and accuracy of information when assessing an emergency. The highest consideration should be given to safety of the personnel, vessel and environment.

In the event of any incident aboard K-Sea Transportation, Pacific Division vessels, the Duty Operations Manager should be notified as soon as possible, per emergency response procedures.
No one other than emergency response, law enforcement and regulatory personnel shall be allowed aboard without consent of management. K-Sea Transportation employees are advised not to discuss incidents with non-K-Sea Transportation people, with the exception of emergency response, law enforcement and regulatory personnel.

3.3.1 Reporting and Documentation

All incidents require reporting and documentation per Incident Reporting and Investigation Procedure and/or the vessel's response plan, and may require drug and alcohol testing. Emergency response incidents should also be documented in AMOS by triggering an unscheduled emergency drill/safety meeting.

3.3.2 Vessel Response/Contingency Plans

A vessel response plan (VRP) / contingency plan (C-PLAN) shall be carried onboard Company vessels in accordance with the recognized laws, codes, standards and regulations in affect for the area of operation. In the event of a K-Sea Transportation vessel oil, fuel or other hazardous substance spill, applicable vessel response plans shall be implemented.

3.3.3 Fire Fighting

The crew of *El Lobo Grande* is trained in emergency response to tug or barge fires. Aboard *El Lobo Grande*, there is a fixed CO2 system in the machinery space. The shipboard fire main system has one hose station located on the main deck forward and one fire hose station located port-side wheelhouse. There are a total of ten (10) hand-held ABC fire extinguishers and two fireman suits on board the tug.

Tank Barge *Capella* is equipped with six (6) 2.5 gallon AFFF USCG approved foam extinguishers. There are also one 150 lb wheeled and fifty B fire extinguishers pressurized during activation with a separate 110-cf N_2 cylinder charged at 2,015 psi.

3.3.4 Medical Emergency

Referring to the US Coast Guard's Incident Action Plan for this project, in the event of an injury requiring immediate medical assistance, there is an independent duty Corpsman assigned to USNS *Navajo* and/or contact the local medical Pago Pago medical facility, LBJ Tropical Medical Center 684 633-4539.

3.3.5 Communication and Signals

We will need hand held fog horn and whistles, if we are to follow this guide.

a. General signals:
   1) A whistle will be treated as a need for assistance.
   2) Five short blasts, repeated, from a hand-held foghorn or vehicle horn indicate an emergency or fire.
b. Telephone and Radio Frequencies: Primary VHF 81A, Secondary 83A. See the Safety Plan Worksheet.

4. Site and Work Area Considerations

a. **Site control: Only authorized personnel will be onsite. Observers will remain a minimum of 500 feet from all operations.**
b. **Site map: Developed and attached to the site safety plan, listing support zone, hazards, and work areas. The Safety Supervisor is responsible for maintaining the Site map.**

c. MSDS: The Site Safety Supervisor will provide the necessary MSDSs in Appendix D for all chemicals workers are exposed to while conducting daily work operations. The Safety Supervisor is responsible for providing current MSDSs and informing the personnel of potential dangers.
d. Hot or Cold Weather considerations (see section 6).
e. Site related considerations:
    1) Marine environment.
    2) Noise.
    3) Hazardous materials (Vapors, Chemicals)
    4) Hazardous Flammable Materials
    5) Equipment operation.
    6) Electrical shock.
    7) Personal Hygiene.
    8) Weather.

Ensure that each work site has a first-aid kit and communication equipment. Workers should be under constant protective observation (buddy system or supervision). An onsite medical corps man is aboard the USNS Sioux and will provide emergency medical assistance to all personnel until evacuation to the LBJ medical facility is accomplished.
Petroleum distillate: Product will vary widely due to source, weathering, and aging. Stay upwind from fresh spills. Keep from skin contact. Wash before eating, drinking, or smoking. If a petroleum distillate is ingested, do not vomit – call medical help.

5. Safety and Hygiene

a. Medical basic: Be prepared to provide first aid and recognize symptoms of heat or cold stress.
b. Heat and cold stress: If a heat stress hazard exists, an alert will be passed to supervisors to implement mandatory rest periods and ensure that fluids are available at all times during rest periods.
c. Buddy system: The buddy system will be observed in the work areas. (Buddy system means organizing employees into work groups in such a manner that each employee of the work group is designated to be observed by at least one other employee in the work group. The purpose of the buddy system is to provide rapid assistance in case of an emergency.)
d. Work near water: Workers within 10 feet of water over 3 feet deep will wear approved flotation devices.
e. High noise levels: Hearing protection will be used in high noise areas exceeding 85 decibels.
f. Decontamination: Personnel will decontaminate at a designated Staging/Decontamination operating contaminated work sites.
g. Personal Protective Equipment (PPE): Level "D" normal work clothing. Level "C" equipment (rain gear, gloves, goggles, boots, hard hat, work vest, coveralls, and respirator) in the standby mode as necessary. Hard hats are required around all crane and boom truck operations. When working in contaminated areas: rubber boots, Tyvek suits and gloves will be worn.
h. Environmental:

i. Lighting: Fixed or portable lighting will be provided for dark areas if working after dark, as per tables H–120.11 of CFR 1910.120(m).
j. Sanitation:
   1) Potable water: An adequate supply of potable water or other drinking fluids will be maintained throughout the site. Containers will close tightly, have a tap, and be labeled in such a manner that the contents are not accidentally used for other purposes.
   2) Non-potable water: Water intended for uses other than drinking will be labeled in such a way that it is not accidentally used for drinking, washing, or cooking.
   3) Toilets: Toilets should be provided and be readily accessible to all work areas.

Note: Mobile work crews with ready access to toilet facilities using their own transportation do not need to have toilet facilities located at their temporary work sites.

6. Weather Exposure

a. Hot Weather Problems:
   1) Heat stress.
   2) Heat exhaustion.
   3) Heat stroke.
   4) Sunburn.
   5) Sun-poisoning.
   6) UV Exposure – Eyes.
   7) Dehydration.

Certain safety problems are common to hot environments. Two of the most dangerous conditions are:

Condition	Symptom	Treatment
Heat Stroke	Heat stroke is the most serious health problem associated with working in hot environments. It occurs when the body's temperature regulatory system fails and sweating becomes inadequate. The body's only effective means of removing excess heat is compromised, with little warning to the victim that a crisis stage has been reached. A heat stroke victim's skin is hot, usually dry, red, or spotted. The body temperature is usually 105°F or higher, and the victim is mentally confused, delirious, perhaps in convulsions, or unconscious.	Any person with signs or symptoms of heat stroke requires immediate hospitalization. However, first aid should be immediately administered. This includes removing the victim to a cool area, thoroughly soaking the clothing with cold water, and vigorously fanning the body to increase cooling. Early recognition and treatment of heat stroke is the only means of preventing permanent brain damage or death.
Heat Exhaustion	Heat exhaustion is caused by loss of large amounts of fluid by sweating, sometimes with excessive loss of salt. A worker suffering from heat exhaustion still sweats but experiences extreme weakness or fatigue, giddiness, nausea, or headache. Vomiting or loss of consciousness characterizes severe cases of heat exhaustion. The skin is clammy and moist, the complexion is pale or flushed, and the body temperature normal.	Rest in cool place and drink plenty of liquids.

Heat tends to promote accidents due to the slipperiness of sweaty palms, dizziness, or the fogging of safety glasses. Aside from these obvious dangers, the frequency of accidents, in general, appears to be higher in hot environments than in more moderate environmental conditions. One reason is that working in a hot environment lowers mental alertness and physical performance. Increased body temperature and physical discomfort promote irritability, anger, and other emotional states, which sometimes cause workers to overlook safety procedures or divert their attention from hazardous tasks.

b. Cold Weather Problems: NA

7. Accident Report Procedure

a. Determine the nature of the illness or injury and call for medical attention if necessary.
b. Complete the Accident Report found on page 10 of the Site Safety Plan.
c. After timely completion of the form, submit the form to the Safety Supervisor and/or Project Manager.
d. The Safety Supervisor will forward a copy of the Accident Report to:
   1) GPC Program Manager
   2) ICS Operations Officer
   3) ICS Safety Officer
   4) GPC Home Station Personnel Department

8. References

a. 29 CFR 1910.120 (HAZWOPER) OSHA regulation for Hazardous Waste Sites
b. NIOSH / OSHA / USCG / EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (NIOSH 85-115) Oct 85
c. ACGIH Threshold Limit Values and Biological Exposure Indices

9. Safety Authorizations.

Safety Supervisor: ____ Date: _____________

Program / Project Manager: ________________________________ Date: _____________
Ron Worthington

GPC INTERNAL ACCIDENT REPORT **Revised 02/00**

1. REPORT NUMBER:	2. NAME OF SUPERVISOR COMPLETING REPORT:
3. DATE INCIDENT OCCURRED:	4. TIME INCIDENT OCCURRED:
5. NAME OF EMPLOYEE (Print or Type):	6. DEPARTMENT OF EMPLOYEE:
7. SEX: _____ MALE _____ FEMALE	8. AGE:
9. TYPE OF MISHAP: _____ INJURY/ILLNESS _____ MOTOR VEHICLE _____ PROPERTY DAMAGE _____ FIRE _____ OTHER	
10. NAMES OF WITNESSES (Print or Type):	
INJURY/ILLNESS INFORMATION	
11. OCCUPATION:	12. NATURE OF INJURY/ILLNESS:
13. METHOD OF TRANSPORTATION TO HOSPITAL: BY WHOM:	14. MEDICAL FACILITY/LOCATION:
15. DATE AND TIME STOPPED WORK:	16. DATE AND TIME RETURNED TO WORK:
17. DESCRIPTION OF MISHAP:	
18. CHECK HERE IF EMPLOYEE DECLINES MEDICAL TREATMENT AT THIS TIME. EMPLOYEE SIGNATURE:	
19. CORRECTIVE ACTION TAKEN AND / OR CORRECTIVE ACTION PROPOSED:	
20. SUPERVISOR COMPLETING REPORT, SIGNATURE AND DATE:	
21. SAFETY SUPERVISOR'S SIGNATURE AND DATE:	
22. BASE/OPERATIONS/PROJECT/PROGRAM MANAGER'S SIGNATURE AND DATE:	
23. REMARKS:	

DISTRIBUTION: Home Station: Safety Supervisor, Base/Operations/Program Manager, Personnel Department
Field Site: Safety Supervisor, GPC Program/Project Manager, ICS Safety, ICS Operations, and GPC Home Station Personnel Dept.

APPENDIX A – K-SEA OIL TRANSFER PROCEDURES MANUAL

K-SEA

Oil Transfer Procedures Manual

T/B Capella
Official Number 1129491

K-Sea Transportation LLC
2700 W. Commodore Way
Seattle, Washington 98199
24 hrs 206-443-9418
fax 206-343-0424

K-Sea Transportation LLC		
Oil Transfer Procedures Manual- Capella	Author: DRA	
Controlled by: DRA	Current date:	Revision: Three
Approved by: DIV	12/4/2009	

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K-Sea Transportation LLC		K-SEA
Oil Transfer Procedures Manual- Capella	Author: DRA	
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Approved by: DIV	12/4/2009	

1. Introduction

K-Sea Transportation LLC operates the tank barge Capella.

Barge dimensions	332' x 74' x 25'.6"
Hull	Steel
Gross tonnage	
Official number	1129491
Classed	Grade A and lower petroleum products, and NLS
Cargo tanks capacity	81,751 bbls.
Classed	ABS ✠ A-1 Ocean Tank Barge

The oil transfer procedures are prepared in accordance with 33 CFR, Part 155, Subpart C. Copies are maintained on the barge Capella and in the K-Sea Transportation LLC offices.

It is the responsibility of the assigned tankerman-PIC to insure the transfer procedures are followed with strict compliance to 33 CFR Parts 154, 155 and 156.

Inquiries regarding the operations of the barge Capella should be directed to:

K-Sea Transportation LLC
2700 W. Commodore Way
Seattle, WA 98199
206-443-9418

K-Sea Transportation LLC		
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2. List of Products [33 CFR 155.750(a)(1)]

This Oil Transfer Procedures Manual lists general descriptions of each product transferred. Cargo Information Cards for the general cargo types carried aboard the barge are located in Appendix C. More detailed information is provided in the Material Data Safety Sheet (MSDS) available on the barge and in K-Sea Transportation LLC offices.

2.1 Generic Name [33 CFR 155.750(a)(1)(i)]

Products carried by the barge Capella are identified on the Certificate of Inspection, List of Approved Cargoes and include the following:

- Diesel Fuel No. 1
- Diesel Fuel No. 2
- Heating Fuel No. 1
- Heating Fuel No. 2
- Gasoline
- Jet Fuel A
- Jet Fuel A-50
- Jet Fuel JP-1, JP-3, JP-4, JP-5
- Naptha
- AVGAS 100 LL
- Ethanol (Ethyl Alcohol)
- Unleaded Gasoline
- Supreme Unleaded
- Gasoline Blending Stocks:
- Alkylate (Gas blendstock)
- Reformate (Gas Blendstock)

2.2 Cargo Information [33 CFR 155.750(a)(1)(ii) and 154.310(a)(5)(ii)(a-g)]

2.2.1 Name of Cargo

See section 1.1 for generic name of products carried onboard.

2.2.2 Appearance

Oil is light-petroleum derivative, amber to clear in color.

2.2.3 Odor

Oil has the familiar odor of petroleum.

2.2.4 Hazards Involved in Handling Cargo

Oil is highly flammable and poisonous if taken internally. Contact with the cargo can cause skin irritation; vapors can cause eye irritation, depression of the nervous system and even chemical pneumonitis. *Refer to MSDS for specific information of a particular product.*

2.2.5 Safe Handling Instructions

All employees as required by K-Sea Transportation LLC policy shall use personal protective equipment including respirators with organic vapor cartridges. *See SM Procedures Manual for specific information about appropriate PPE and respiratory protection.*

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2.2.6 Warning Signals

A red signal (flag by day and electric lantern at night) shall be placed so that it is visible during transfers at dock facilities. [46 CFR 35.30-1(a)]

2.2.7 Signs [46 CFR 35.30-1(b) and 46 CFR 197.535]

In letters not less than 2" high shall be displayed on the barge housing to warn all persons approaching of the hazards associated with barge transfers. Warnings must say:

WARNING: No Smoking, No Open Lights, No Visitors
Danger-Benzene
Regulated Area
Cancer Causing Agent
Flammable
No Smoking
Authorized Personnel Only
Respirator Required

2.2.8 Persons in Charge and Pre-Transfer Conference

No Person May Transfer Fuel Unless:

- A Person-in-Charge (PIC) is designated by the operator for each transfer to or from the vessel and for each tank cleaning operation. [33 CFR 155.700] *A copy of the designation letter is found in the vessel's documents binder.*

- A pre-transfer conference is held by the PIC and the transferring/receiving facility prior to the start of any transfer.

2.2.9 Spill Procedures

In the event of a spill or leak during transfer operations, the transfer is to be stopped immediately until the source of leak or spill is determined and the cause eliminated prior to resumption of the transfer operation. *See the Spill Response Field Guide of the K-Sea Transportation LLC Vessel Response Plan for more information on reporting and mitigating spills.*

2.2.10 Fire Fighting Procedures

A portable dry chemical fire extinguisher (BII) is to be placed at each header station during transfer operations for easy access. No less than 4 portable extinguishers are maintained onboard the barge. Additional portable fire extinguishers are carried onboard the tug. *Fire fighting procedures are described in the Spill Response Field Guide.*

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3. Transfer Systems [33 CFR 155.750(a)(2)]

The following oil transfer procedures are applicable to all cargoes carried aboard the barge Capella.

3.1 Line Diagrams [33 CFR 155.750(a)(2)(i)]

Line diagrams of the vessel's transfer piping, including the location of each valve, pump, control device, vent, and overflow can be found included at the end of this section. *Basic drawings are provided in Appendix B and a detailed piping diagram is mounted in the barge office for reference.*

3.2 Location of Tanks, Pumps and Piping [33 CFR 155.750(a)(2)(ii)]

The Barge Capella has ten cargo tanks, five port and five starboard, forward and after rakes. Each cargo tank has one ten inch suction/loading valve. The barge has two deepwell pumps driven by two Cat 3408 diesel engines. Either pump can be used to pump all tanks and discharge from either header, through use of the crossover valves.

3.3 Ballast System [33 CFR 155.750(a)(2)(ii)]

The barge is not equipped with a ballast system.

3.4 Containment System [33 CFR 155.750(a)(2)(iii)]

The containment system on board this barge consists of an 8" coaming around the entire area of the trunk deck. Should there be a spill on deck; the oil will be contained within this area. The product will be removed by means of a portable pump system to storage drums or to another suitable temporary storage area. Final cleanup is made with sorbent material (sweeps, pads, etc.). All contaminated material is placed in the oily waste drums or other suitable temporary storage area and properly disposed of at an approved facility.

Plugs must be installed in rainwater drains prior to commencing transfer operations.

3.5 Loading System

To load, connect the hoses to the appropriate header. Ensure the pump suction is secured. Open the appropriate header, line and block valves to the tank(s) to be loaded. Unlash and open the cargo tank valve(s) to the tanks to be loaded. Recheck and confirm the valve alignment before starting the product flow.

To discharge, connect the hoses to the appropriate header. Start the diesel pump engine(s) and let them warm up while conducting the Pre-Transfer Conference and completing the Declaration of Inspection. Determine the cargo discharge sequence per the cargo load/discharge plan. Open the suction and discharge valves to the deep well pump being used. Open the appropriate suction line valves to the tank(s) to be discharged. Unlash and open the cargo tank valve(s) to the tank(s) that the discharge will be started from. Recheck and confirm the valve alignment before starting the product flow. After conferring with facility/vessel personnel that they are ready to receive, open the header valve and engage the pump(s) at idle speed. Check pressure gauges for evidence of product flow and check all connections for leaks. With the concurrence of the receiving facility or vessel, increase pump engine rpm's to achieve the desired flow rate and pressure.

3.6 Stripping

The Capella is an aft-centerline stripping barge, with the exception of 5P and 5S, which have their sumps forward and inboard. The bellmouths are located in sumps. The stripping sequence would normally be started with tanks furthest forward then proceeding in sequence towards the pump (i.e., tanks #1 through #5), with the exception that a slight trim by the head is necessary to strip the 5's.

4. Number of Persons On Duty [33 CFR 155.750(a)(3)]

The minimum number of persons on duty aboard the barge Capella during oil transfer operations shall be one licensed Tankerman/PIC. An additional Tankerman-PIC or Tankerman Assistant may be assigned at the discretion of the PIC.

5. Duties of Persons on Duty [33 CFR 155.750(a)(4)]

5.1 Tankerman/PIC

- Personally supervise connections, valve and system alignments, loading, topping off, disconnecting and all other critical transfer procedures.
- Personally instruct all other persons on duty when to start the flow of oil to the vessel.
- Personally supervise preparation of the barge for the acceptance of cargo.
- Confer with the PIC of the other facility or vessel to ensure that each understands how to work together during the transfer operation.
- Conduct an inspection and complete the Declaration of Inspection prior to the transfer.
- Tend the tanks being loaded, including taking soundings and maintaining visual observations of the transfer hose(s) and connection(s) to the tank(s).
- Advise all concerned of unusual conditions.

WHEN IN DOUBT, SHUT DOWN TRANSFER OPERATIONS

5.2 Tankerman Assistant

- Tend to the tanks being loaded and unloaded as directed by the PIC, including taking soundings and maintaining visual observations of the transfer hose(s) and connection(s) to the tank(s).
- Keep the PIC closely advised of the level of the cargo in the tank(s).
- Advise the PIC IMMEDIATELY of any unusual conditions. When in doubt, notify the PIC while shutting down the transfer operations SIMULTANEOUSLY.

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6. Mooring Procedures [33 CFR 155.750(a)(5)]

The Master of the attending tug shall designate a crewman to tend mooring lines as directed by PIC to keep the barge alongside the dock and/or in proper alignment with shore cargo header.

7. Emergency Shutdown and Communications [33 CFR 155.750(a)(6)]

7.1 Locations & Operation of Emergency Shutdown

Pull cables for emergency shutdowns on each pump engine are located just aft of cargo manifolds amidships. These will stop the cargo pump engine when the cables are pulled. The area around toggle handle is painted red and is stenciled EMERGENCY SHUT DOWN.

The PIC will ensure the system is tested before every discharge.

7.2 Communications

Communications will be maintained during transfer operations to another vessel or shoreside facility by means of intrinsically safe portable VHF radios.

8. Topping Off Procedures [33 CFR 155.750(a)(7)]

Tanks will be topped off at a reduced rate of flow. This may be accomplished by opening more tanks or having the dock reduce their loading rate. The tank level is monitored with the installed gauging system, and visually through viewing ports on each tank expansion trunk.

9. Valves Closed [33 CFR 155.750(a)(8)]

After the transfer is complete, the PIC checks each valve and insures that it is closed and lashed after completion of transfer.

10. Reporting Spills [33 CFR 155.750(a)(9)]

Reporting of spill on the navigable waters of the U.S. is made immediately to the K-Sea Transportation LLC Qualified Individual for immediate action and further reporting to federal and state authorities. When reporting a spill, use the Initial Event Report form *(see Section I of the K-Sea Transportation Vessel Response Plan for more information).*

At a minimum the following must be reported:

- Vessel(s) name and location
- Date and time of event
- Nature of event (include injury data)
- Numbers of persons on board
- Estimate amount of discharge
- Actions planned
- Radio frequency monitored

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11. Closure of Openings [33 CFR 155.750(a)(10)]

All ullage/sounding openings, fill line valves, manholes and any other openings that maintain the seaworthy condition of the barge to prevent inadvertent release of oil must be properly closed at all times when the barge is at anchor or underway. At completion of transfer operations, the PIC and the Master of the towing vessel shall insure that all such openings are properly closed by a mechanical means. If transfer operations require such openings to be opened while underway or at anchor, such opening must be authorized and supervised by a licensed officer or certified tankerman designated as the PIC. [46 CFR 31.15-5]

12. Transfer Hose Marking Procedures [33 CFR 155.750(a)(11)]

Each transfer hose is marked annually with the (1) test date, (2) maximum allowed workable pressure (MAWP) and (3) "Oil Service."

13. Declaration of Inspection [33 CFR 156.150]

Under no circumstances may oil transfer operations be commenced until a pre-transfer conference between PIC and the transferring/receiving facility is completed in accordance with 33 CFR 156.120 and 150. A Declaration of Inspection (DOI) must be executed and signed by each designated PIC and a copy maintained onboard the vessel and/or the facility for at least 1 month from the date of signature. [33 CFR 156.150(f)]

14. Vapor Control System Procedures [33 CFR 155.750 (d)]

The "Capella" is equipped with a Vapor Control System (VCS). This system consists of piping, valves, and other components to permit the barge to connect to a marine transfer facility's vapor recovery system.

14.1 Line Diagrams [33 CFR 155.750 (d)(1)]

A line diagram of the vapor control system is located in Appendix B.

14.2 Location of Spill Valves and Rupture Disks [33 CFR 155.750 (d)(2)

The VCS is not equipped with spill valves or rupture disks.

14.3 Maximum Allowable Transfer Rate [33 CFR 155.750 (d)(3)]

The maximum allowable transfer (loading) rate in any combination of active tanks is 10,000 bbls/hr.

14.4 Initial Transfer Rate [33 CFR 155.750 (d)(4)

The initial transfer (loading) rate for any tank or combination of tanks should be at the terminal's minimum rate of delivery, and not more than 1000 bbls/hr per tank for 10" barge pipelines, and 1500 bbls/hr for 12" barge pipelines.

This rate is in the aggregate; for instance, if the minimum initial rate from the terminal is 2,000 bbls/hr, you can open 4 tanks and achieve a rate of 500 bbls/hr per tank.

See the K-Sea Transportation LLC Procedures Manual, Section 07-05 Tank Barge Operations, for additional information.

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14.5 Transfer Rate vs. Pressure Drop Tables/Graphs [33 CFR 155.750 (d)(5)

Pressure drop tables/graphs prepared in accordance with 46 CFR 39.30-1 (b) are located in Appendix B.

14.6 Relief Valve Settings [33 CFR 155.750 (d)(6)]

The cargo tank pressure/vacuum relief valves and the vapor line pressure/vacuum relief valve are set to relieve at 2.0 psi pressure, and 0.5 psi vacuum.

14.7 VCS Operations [33 CFR 155.750 (d)(7)]

14.7.1 Pre-Transfer Equipment Inspection [33 CFR 155.750 (d)(7)(i)]

Prior to cargo operations using the VCS, a complete inspection of the VCS components shall be made by the Tankerman-PIC. This inspection should include a visual inspection of the vapor hose or loading arm, tank PV vents, vapor pipeline HV/PV valve, valves, electrical insulating device in the hose/arm connection, closed gauging system, alarm systems and the independent automatic shutdown system (shore umbilical).

14.7.2 Vapor Line Connections [33 CFR 155.750 (d)(7)(ii)]

Connections to the VCS are to be made only with hoses or loading arms designated specifically for this purpose. This connection is fitted with a ½" stud at the top of the vapor connection flange, designed to engage with a corresponding hole on a vapor hose or arm.

14.7.3 Closed Gauging System [33 CFR 155.750 (d)(7)(iii)]

The closed gauging system is designed to provide an accurate indication of the level of the product in the tank at any time during the load. The system master control station is normally located in the barge office. The system is energized by turning the system power switch to "on" and after a short self-test sequence, will display the ullage reading in the tank. A fault indication given by the system or any of the individual tank gauging units will be corrected before loading.

14.7.4 High Level Alarm System [33 CFR 155.750 (d)(7)(iv)]

In addition to alarms on the closed gauging system, the Capella is equipped with an independent high level and overfill alarm system. This consists of both an electrical float system and a manual dipstick system.

The electrical float system transmits an alarm condition to the master unit located in the barge office which then displays an alarm condition on a lighted visual display on the barge deck, as well as sounding an appropriate horn or siren signal. This system is energized by turning the system power switch to the "on" position. The individual float units are then tested by removing the access cap to the test actuating stick, and then slowly raising the test stick until the "high level" alarm sounds. The stick is then raised further until the "overfill" alarm sounds.

The manual dipstick system provides a visual indicator when the liquid level in the tank is within 42" of the tank top. The system is activated by removing the protective cap from the top of the dipstick housing and adjusting the collar to the specific gravity of the liquid being loaded. The dipsticks are tested by raising them slowly to their full extension and then lowering them back into their housings, ensuring freedom of movement and legibility of the colors and markings on the dipstick.

14.7.5 Independent Automatic Shutdown System [33 CFR 155.750 (d)(7)(v)]

The independent automatic shutdown system is a function of the electrical high level/overfill alarm system described above. It consists of an "umbilical" connector on the barge. When connected to an appropriately equipped marine terminal, the alarm conditions are not only transmitted to the barge alarm system, but also transmitted to the shore side terminal control room. The system will indicate a high level condition by sounding the terminal's alarm. If an overfill condition is indication, the terminal's automatic shutdown system is activated and initiates automatic shutdown of the emergency mechanical cut-out valves (ECOV's) at the terminal.

It is imperative that the Tankerman-PIC understand that having an overfill condition while connected to a terminal's shutdown system is a serious event, and could result in punitive action by the terminal and investigative action by the USCG in the same manner as for a spill.

DO NOT ALLOW ANY INDIVIDUAL TANK TO EXCEED THE HIGH LEVEL ALARM ULLAGE READING WHILE CONNECTED TO AN AUTOMATIC SHUTDOWN SYSTEM!

14.7.6 Monitoring of Cargo Levels [33 CFR 155.750 (e)(1)

During closed loading evolutions using the VCS, the cargo level in each tank will be monitored continuously using the electrical closed gauging system. In the initial stages of loading, and in topping off, the movement and level of cargo will also be monitored visually through the viewing ports located in the individual tank expansion trunks.

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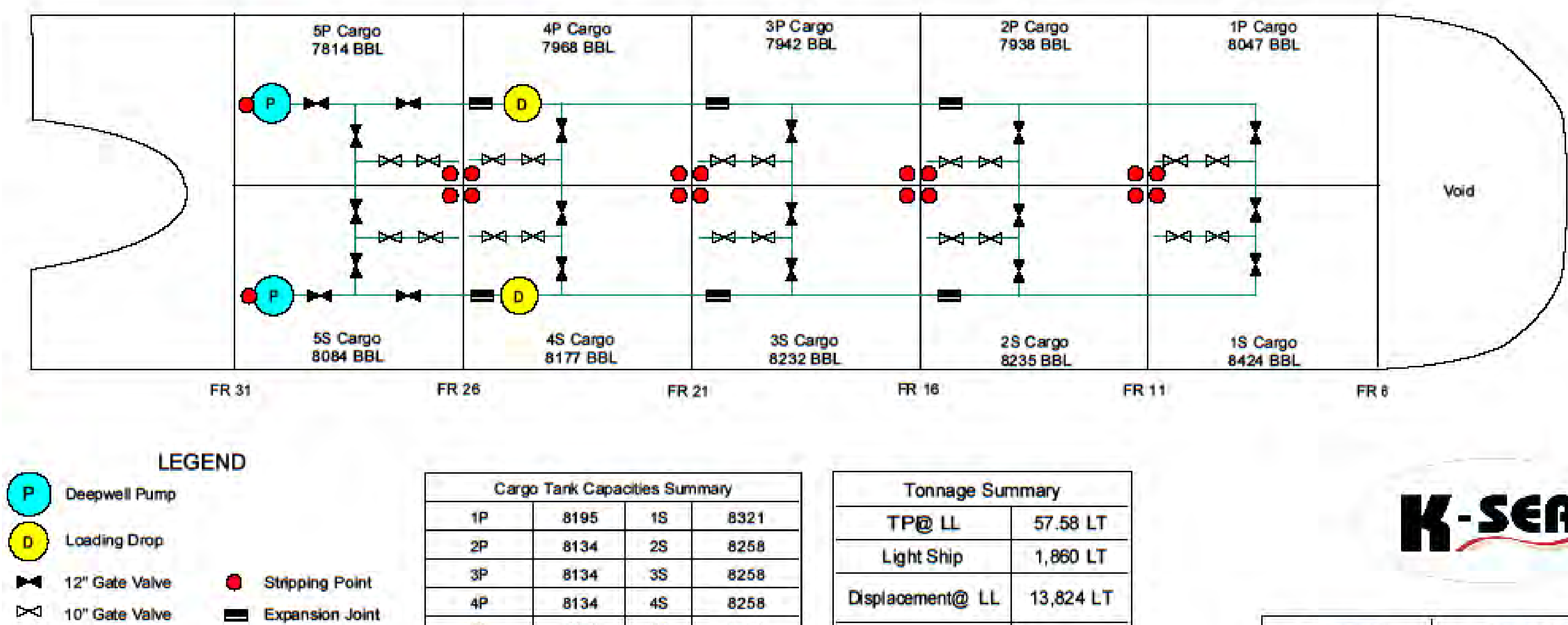
15. Appendix A- Tank Plan and Cargo Piping Plans

Figure 1: Tank Layout and Below Deck Cargo Piping Diagram

Figure 2: On-Deck Cargo and Vapor Control System Piping and Fittings Diagram

Figure 3: Vapor Recovery Pressure Drops Graph

Capella
#1129491
Cargo Piping Plan
Below Deck

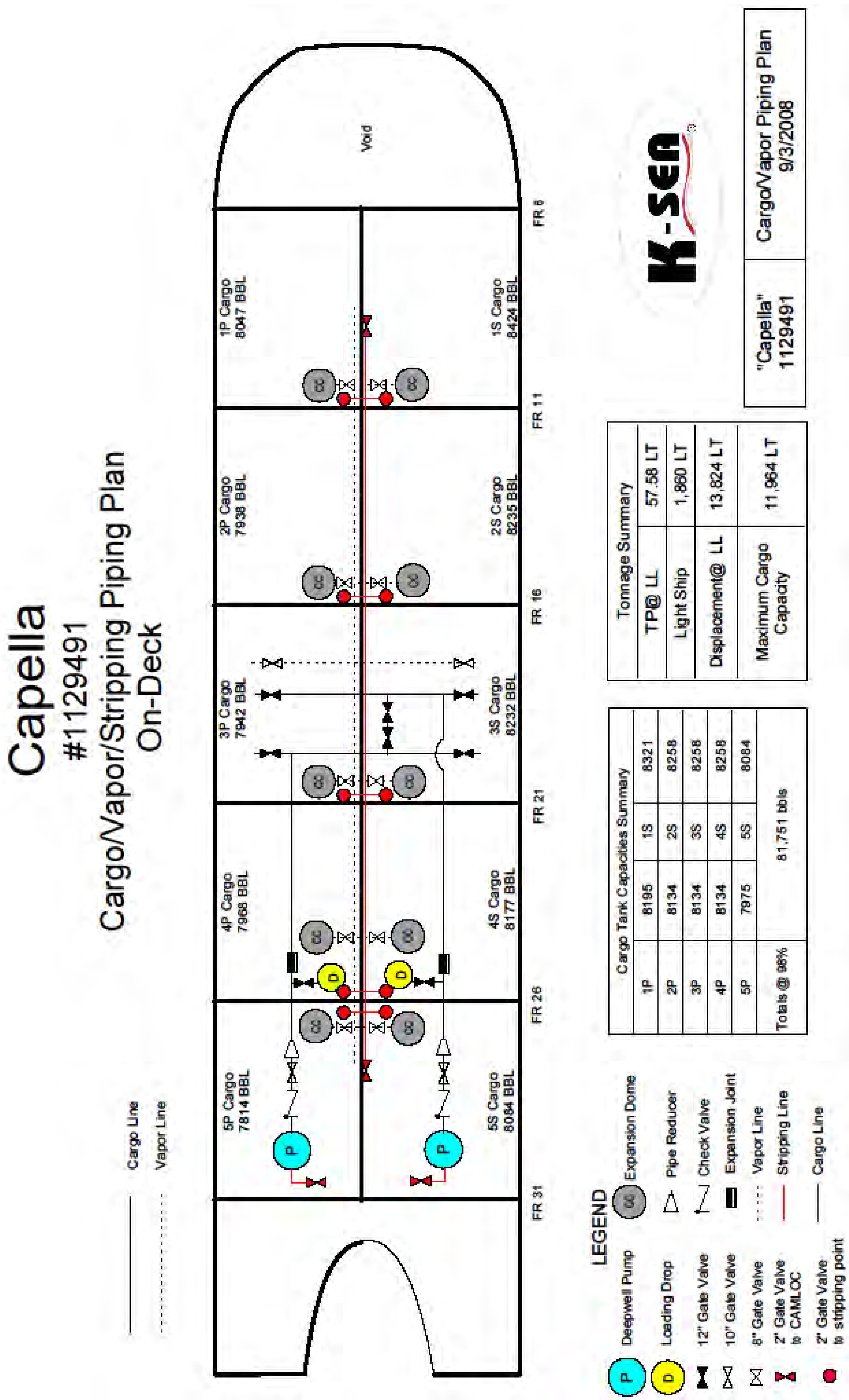


Cargo Tank Capacities Summary			
1P	8195	1S	8321
2P	8134	2S	8258
3P	8134	3S	8258
4P	8134	4S	8258
5P	7975	5S	8084
Totals @ 98%	81,751 bbls		

Tonnage Summary	
TP@ LL	57.58 LT
Light Ship	1,860 LT
Displacement@ LL	13,824 LT
Deadweight	11,964 LT

K-SEA

"Capella" 1129491	Cargo Piping Plan 9/3/2008



Cargo Tank Capacities Summary

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Totals @ 98%	81,751 bbls		

Tonnage Summary

TP@ LL	57.58 LT
Light Ship	1,860 LT
Displacement@ LL	13,824 LT
Maximum Cargo Capacity	11,964 LT

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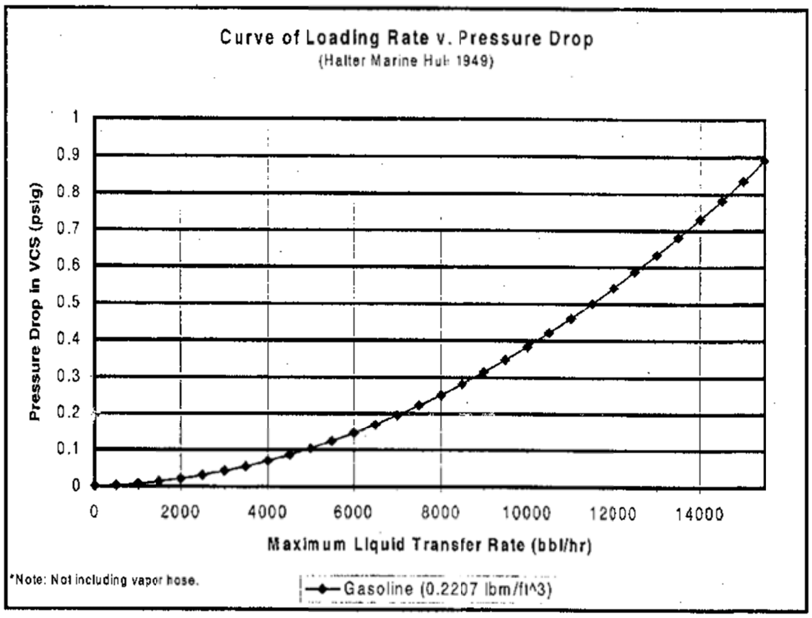
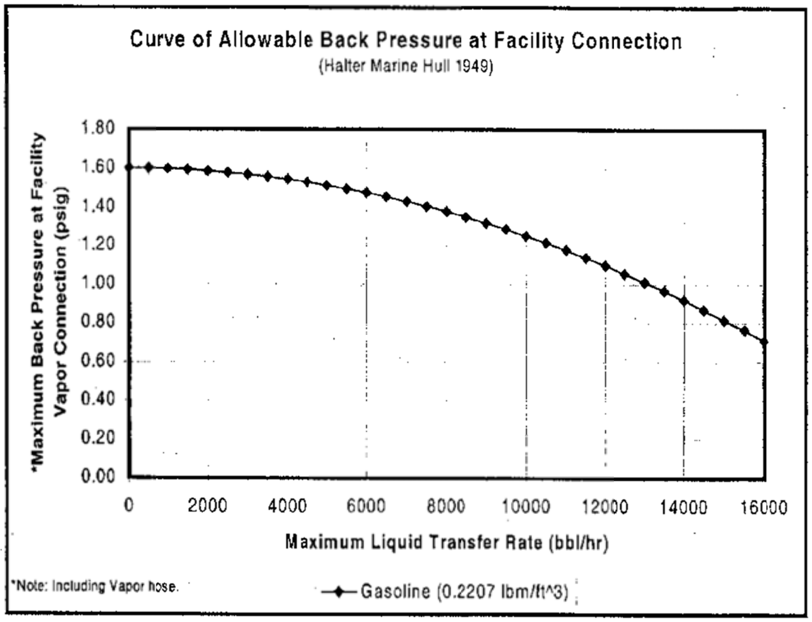
Graph as required by 46 CFR 39.30-1(b)(3)





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APPENDIX B – DECLARATION OF INSPECTION (DOI)

DECLARATION OF INSPECTION Before Transfer of Liquid Cargo in Bulk (Incorporates requirements of 33 CFR 156.120 & 150, 46 CFR 35.35-30)

Transferring Vessel/Facility Name:	Receiving Vessel/Facility Name:	
Transfer Location (Port-Berth/Facility/Coordinates)	Date/Time Transfer Started:	Date/Time Transfer Completed:

PIC's shall verify by inspection and indicate by initialing that their vessel or facility meets the following requirements:

Vessel — Facility / Vessel

___ ___ ___ A. The mooring lines are strong enough and long enough for all expected conditions ………………………………… ___ ___ ___
___ ___ ___ B. Transfer hose and/or loading arms are long enough for intended use without strain from vessel movement………… ___ ___ ___
___ ___ ___ C. Transfer hoses are supported to prevent damage to the hoses and undue strain on the couplings…………………… ___ ___ ___
___ ___ ___ D. The transfer system is properly lined up for discharging or receiving oil or hazardous material…………………… ___ ___ ___
___ ___ ___ E. Each part of the transfer system not being used during the transfer operation is securely blanked off or shut off……. ___ ___ ___
___ ___ ___ F. Each hose or loading arm end not connected for transfer operation is blanked off using acceptable closure devices…. ___ ___ ___
___ ___ ___ G. The transfer system is attached to a fixed connection on the vessel and the facility…………………………………. ___ ___ ___
___ ___ ___ H. Each transfer hose is free from bulges and soft spots, or gouges and cuts that penetrate the 1st layer of reinforcement… ___ ___ ___
___ ___ ___ I. Each transfer hose and loading arm meets the design and marking requirements……………………………………… ___ ___ ___
___ ___ ___ J. Each connection is of an approved design and meets the gasket, and bolting requirements……………………………… ___ ___ ___
___ ___ ___ K. Required overfill protection devices or other monitoring devices are installed and operation properly…………………. ___ ___ ___
___ ___ ___ L. Required discharge containment equipment is readily assessable or deployed ………………………………………… ___ ___ ___
___ ___ ___ M. Required discharge containments have been provided for couplings and are drained as necessary …………………… ___ ___ ___
___ ___ ___ N. All scuppers or other drains are closed or plugged ……………………………………………………………………… ___ ___ ___
___ ___ ___ O. All connections in the transfer system are leak free except for permissible drippage……………………………………… ___ ___ ___
___ ___ ___ P. A communication system is provided between the facility and vessel and is operable…………………………………… ___ ___ ___
___ ___ ___ Q. An emergency shut down system is available and operable……………………………………………………………… ___ ___ ___
___ ___ ___ R. Required PIC's are on duty at the transferring and receiving stations……………………………………………… ___ ___ ___ ___
___ ___ ___ S. Each PIC is on site, has an Operations/Transfer Manual available and controls transfers in accordance with it ……….. ___ ___ ___
___ ___ ___ T. Other personnel as required by Operations/Transfer Manual available and perform prescribed duties ………………… ___ ___ ___
___ ___ ___ U. At least one person is present who fluently speaks the language(s) of both PIC's ……………………………………… ___ ___ ___
___ ___ ___ V. Persons in charge have held a conference to ensure that the mutual understanding of the following transfer operations… ___ ___ ___
___ ___ ___ 1. The identity of the product(s) to be transferred---enter below…………………………………………………………… ___ ___ ___
___ ___ ___ 2. Sequence of transfer

Product	1)	2)	3)	4)
BPH				

___ ___ ___ 3. Transfer rate of flow ……………………………………………………………………………………………………… ___ ___ ___
___ ___ ___ 4. Name or title and location of each person participating in the transfer operation………………………………………… ___ ___ ___
___ ___ ___ 5. Details of the transferring and receiving systems including procedures to ensure that MAWP's aren't exceeded……..___ ___ ___
___ ___ ___ 6. Critical stages of the transfer operation such as start up, tank switches and topping off ………………………………… ___ ___ ___
___ ___ ___ 7. Federal, state and local rules that apply to the transfer of oil or hazardous materials …………………………………… ___ ___ ___
___ ___ ___ 8. Emergency procedures ……………………………………………………………………………………………………... ___ ___ ___
___ ___ ___ 9. Discharge containment and reporting procedures ………………………………………………………………………… . ___ ___ ___
___ ___ ___ 10. Watch or shift arrangements ……………………………………………………………………………………………… ___ ___ ___
___ ___ ___ 11. Transfer shutdown procedures …………………………………………………………………………………………… ___ ___ ___
___ ___ ___ 12. An agreed-upon frequency if radios are used …………………………………………………………………………… ___ ___ ___
___ ___ ___ W. Between sunset and sunrise adequate lighting of the transfer connection points and work areas is provided ………….. ___ ___ ___
___ ___ ___ X. If smoking is permitted in the marine transfer area, it will only be allowed in designated locations …………………… ___ ___ ___
___ ___ ___ Y. A *Vapor Recovery Appendix* is attached if the transfer includes collection ashore of vessel cargo tank vapors ………. ___ ___ ___

The following requirements shall be verified by inspection and initialed by vessel PIC only

___ ___ ___ 1. Required warning signs and red warning signals are displayed ……………………………………………………… ___ ___ ___
___ ___ ___ 2. No welding or hot work, and no unauthorized repair work in cargo spaces, is being conducted ………………………… ___ ___ ___
___ ___ ___ 3. No fires or open flames are present on deck or in compartments on the deck on which cargo connections are made …… ___ ___ ___
___ ___ ___ 4. Boiler and galley fires are safe are safe to light during transfers of Grade A, B, or C cargoes or have been extinguished.. ___ ___ ___
___ ___ ___ 5. A determination has been made regarding smoking off of weather decks during transfers of Grade A, B, or C cargoes… ___ ___ ___
___ ___ ___ 6. The overboard or sea suction valves are sealed or lashed in the closed position……………………………………… ___ ___ ___
___ ___ ___ 7. If cargo-tank inerting is required, the system is maintaining an inert atmosphere in the cargo tanks…………………… ___ ___ ___
___ ___ ___ 8. Applicable sections of the vessel response plan have been reviewed and initial response resources are available……… ___ ___ ___

The undersigned person in charge of the liquid cargo in bulk about to begin or continue, do certify that I have personally inspected this vessel or facility, as appropriate, with reference to the above listed requirements, and that opposite each of the applicable items list I have indicated by initialing that the vessel/facility complies with all pertinent regulations and that I agree to begin/continue the transfer operation.

Vessel Person in Charge			Facility/Vessel Person in Charge		
Signature	Date	Time	Signature	Date	Time
Signature	Date	Time	Signature	Date	Time
Signature	Date	Time	Signature	Date	Time

Retain this Declaration of Inspection for at least one month (Revised 1/10)

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APPENDIX C – K-SEA EMERGENCY RESPONSE GUIDE

K-Sea Transportation LLC	PLACARD
Emergency Response Guidebook	KST-0801.04

EMERGENCY RESPONSE GUIDEBOOK

1. **Fire on Tug**
2. **Fire on Barge**
3. **Abandon Ship**
4. **Collision/Allision**
5. **Man Overboard**
6. **Medical Emergency**
7. **Fatality**
8. **Incapacitation of Watch Officer**
9. **Flooding/Hull Failure**
10. **Grounding**
11. **Oil/Hazardous Substance Spill Response**
12. **Loss of Critical Systems**
13. **Lost Barge Retrieval- Initial Action**
14. **Lost Barge Retrieval- Direct Recovery**
15. **Lost Barge Retrieval- Emergency Tow Wire Recovery**
16. **Lost Barge Retrieval- Retrieval Hook Recovery**
17. **Terrorist Activity- Underway/Inport**
18. **Bomb Threat**
19. **Security Breach**

Author: DC	Approved: VP	Controlled: RM	Revision: 1	Date: 4/9/2008
Distribution: 1 – Vessel, Seattle Office	Retain for: 1 – US	Required by: COPM-08.01	Page 0 of 20	

FIRE ON TUG

- ❑ Sound alarm; pass "Fire" and location over PA if available.
- ❑ Muster crew.
- ❑ Call for assistance. Inport, call 911 or USCG on CH 16. Underway, initiate PAN or MAYDAY broadcast on CH 13/16 VHF, 2182 KHz, or 4125 kHz; activate "emergency" mode on DSC radio if so equipped. Notify VTS if in VTS area.
- ❑ Take initial extinguishing actions with hand fire extinguishers if possible.
- ❑ Account for all personnel, initiate rescue as necessary, assess and treat injuries.
- ❑ Energize fire pumps and charge fire hoses.
- ❑ Secure fuel and ventilation supply systems as appropriate.
- ❑ Secure running machinery/engines as appropriate.
- ❑ Assess and attack fire with appropriate extinguishing agents.
- ❑ Consider use of fixed extinguishing systems.
- ❑ Maneuver tug and tow to safe anchorage if able. Consider anchoring on tow wire to maintain control of tow at a safe distance.
- ❑ Consider preparations to abandon ship.
- ❑ Notify K-Sea Transportation LLC Duty Ops Manager as soon as practical.
- ❑ When fire is extinguished, post re-flash watch.
- ❑ Assess damage and ability to restore critical functions and machinery.
- ❑ Overhaul fire scene and cleanup only after conferring with K-Sea Transportation LLC Duty Ops Manager and evaluating whether fire scene and associated evidence is to be preserved for further investigation.
- ❑ Prepare incident report and obtain witness statements per K-Sea Transportation LLC incident reporting procedures.

FIRE ON BARGE

- ❑ Sound alarm; pass word over PA system if available.
- ❑ Muster crew.
- ❑ Call for assistance. Inport, call 911 or USCG on CH 16. Underway, initiate PAN or MAYDAY broadcast on CH 13/16 VHF, 2182 KHz, or 4125 kHz; activate "emergency" mode on DSC radio if so equipped. Notify VTS if in VTS area.
- ❑ Secure cargo transfer and running machinery/engines as appropriate.
- ❑ Notify terminal PIC to activate terminal fire extinguishing systems.
- ❑ Take initial extinguishing actions with hand fire extinguishers if possible.
- ❑ Account for all personnel, initiate rescue as necessary, assess and treat injuries.
- ❑ On attending tug, energize fire pumps and charge fire hoses. Consider maneuvering so as to direct firefighting water to protect barge personnel and allow egress from barge.
- ❑ Assess and attack fire with appropriate extinguishing agents.
- ❑ If underway, maneuver tug and tow to safe anchorage if able. Consider anchoring on tow wire to maintain control of tow at a safe distance.
- ❑ If at a terminal, initiate emergency disconnect of cargo hoses or arms.
- ❑ Take direction from Fire Department commander as to whether or not barge should be moved away from terminal.
- ❑ Notify K-Sea Transportation LLC Duty Ops Manager as soon as practical.
- ❑ When fire is extinguished, post re-flash watch.
- ❑ Assess damage and ability to restore critical functions and machinery.
- ❑ Overhaul fire scene and cleanup only after conferring with K-Sea Transportation LLC Duty Ops Manager and evaluating whether fire scene and associated evidence is to be preserved for further investigation.
- ❑ Submit incident report and obtain witness statements per K-Sea Transportation LLC incident reporting procedures.

ABANDON SHIP

- ❑ Sound alarm; pass "Prepare to Abandon Ship" over PA if available.
- ❑ Deck watch officer make "MAYDAY" calls on CH 13/16 VHF, 2182 KHz, and/or 4125 kHz; activate "Emergency" mode on DSC radio if so equipped. If time allows, call K-Sea Transportation LLC Duty Ops Manager on cellular or satellite phone.
- ❑ Remove EPIRB from tug stowage location, manually activate and carry to abandon ship station.
- ❑ Carry handheld radios, phones, flares, extra food and extra water to life raft.
- ❑ Time permitting, retain official logbook and barge paperwork.
- ❑ Muster at life raft station, account for all personnel.
- ❑ Don immersion suits.
- ❑ Prepare life raft for deployment.
- ❑ Deploy and enter life raft as best able.
- ❑ Maneuver away from vessel(s) if possible.
- ❑ Assess condition of survivors.
- ❑ Establish watches and prepare signaling devices. Continue attempts to establish contact with rescue parties via phone, radio, or visual signals.

COLLISION/ALLISION

- ❑ Sound danger signal on ship's whistle; sound general alarm; pass "Brace for Collision" over PA if available.
- ❑ Deck watch officer take any remaining evasive maneuvers possible to lessen impact.
- ❑ Following impact, account for all personnel, immediately assess damage and initiate damage control as able.
- ❑ Maneuver tug (and tow if applicable) to safe anchorage or moorage. Evaluate necessity to intentionally ground vessel(s) to prevent sinking.
- ❑ Evaluate necessity to abandon ship.
- ❑ If own ship situation is stable, contact other vessel, render assistance as necessary and able.
- ❑ Call for assistance. Call USCG on CH 16. Underway, initiate PAN or MAYDAY broadcast on CH 13/16 VHF, 2182 KHz, and/or 4125 kHz; activate "Emergency" mode on DSC radio if so equipped. Notify VTS if in VTS area.
- ❑ Notify K-Sea Transportation LLC Duty Ops Manager by quickest means available.
- ❑ If allision has occurred with a bridge, notify the bridge operator ASAP.
- ❑ Conduct drug/alcohol testing as directed by K-Sea Transportation LLC Duty Ops Manager.
- ❑ Submit incident report and obtain witness statements as appropriate per K-Sea Transportation LLC incident reporting procedures.

MAN OVERBOARD

- ❑ Post lookout/maintain visual of person in the water.
- ❑ Deploy flotation device and means of marking location.
- ❑ Sound general alarm; pass "Man Overboard" over PA if available.
- ❑ Activate MOB position function on GPS unit and/or vessel ECS if so equipped.
- ❑ Sound danger signal on ship's whistle.
- ❑ Commence maneuvering back to man overboard.
- ❑ Call for assistance. Call USCG on CH 16 VHF. Initiate PAN or MAYDAY broadcast on CH 13/16, 2182 KHz, and/or 4125 kHz; activate "Emergency" mode on DSC radio if so equipped. Notify VTS if in VTS area.
- ❑ Quickly evaluate approach and safe pickup method for man overboard.
- ❑ Ensure crew on deck has donned work vest and is ready to deploy recovery equipment, e.g. heaving lines, boarding ladder, personnel retrieval line (PRL).
- ❑ Have one deck crewmember in immersion suit with tether line ready to enter water when close to man overboard.
- ❑ When man overboard is recovered, evaluate medical condition, provide necessary medical assistance and arrange for medevac as necessary.
- ❑ Call to stand down further assistance. Call USCG on CH 16 VHF. Initiate CANCEL PAN or CANCEL MAYDAY broadcast on CH 13/16, 2182 KHz, and/or 4125 kHz; secure "Emergency" mode on DSC radio if activated. Notify VTS if in VTS area.
- ❑ Notify K-Sea Transportation LLC Duty Ops Manager as soon as practical.
- ❑ Submit incident report and obtain witness statements as appropriate per K-Sea Transportation LLC incident reporting procedures.

MEDICAL EMERGENCY

- ❑ Assess the severity of the situation and ensure safety of the general area.
- ❑ Ensure Master is notified.
- ❑ Don PPE; latex gloves, safety glasses, other PPE as necessary.
- ❑ Render critical care; administer CPR, ABC's, treat for shock as necessary.
- ❑ Contact maritime medical advisor if required or in doubt. Administer continuing medical care under direction of the medical advisor.
- ❑ Notify K-Sea Transportation LLC Duty Ops Manager as soon as practical.
- ❑ If condition may require MEDEVAC or life support, contact USCG on CH 16 VHF, 2182 KHz, and/or 4125 kHz. Prepare for and execute evacuation.
- ❑ Retain and package medical waste for disposal per waste management plan.
- ❑ Administer drug/alcohol tests as directed by K-Sea Transportation LLC Duty Ops Manager.
- ❑ Submit incident report and obtain witness statements as appropriate per K-Sea Transportation LLC incident reporting procedures.
- ❑ Inventory medical kits and requisition replacement medical supplies as necessary.

FATALITY

- ❑ Ensure Master is notified.
- ❑ Notify K-Sea Transportation LLC Duty Ops Manager as soon as practical.
- ❑ Contact maritime medical advisor for instruction.
- ❑ Don appropriate PPE.
- ❑ Prepare body for handling and possible stowage; secure the site around the body until released by a coroner or other qualified authority.
- ❑ Administer drug/alcohol tests to crew members involved in incident resulting in death as directed by K-Sea Transportation LLC Duty Ops Manager.
- ❑ Prepare for and execute evacuation/transportation.
- ❑ Retain and package medical waste for proper disposal per waste management plan.
- ❑ Submit incident report and obtain witness statements as appropriate per K-Sea Transportation LLC incident reporting procedures.
- ❑ Inventory medical kits and requisition replacement medical supplies as necessary.

INCAPACITATION OF WATCH OFFICER

- ❑ Sound general alarm; pass the word over PA system if available.
- ❑ Take control of the vessel; reduce power and maintain steerage with due consideration of the tow position and speed as appropriate.
- ❑ Determine location and avoid any immediate navigational hazards.
- ❑ Assess the severity of the situation.
- ❑ If there is no other licensed deck officer available, the most experienced person available on board should take control of the vessel and tow as appropriate then do the following:
- ❑ Call for assistance. Call USCG on CH 16 VHF. Initiate PAN broadcast on CH 13/16, 2182 KHz, and/or 4125 kHz; activate "Emergency" mode on DSC radio if so equipped. Notify VTS if in VTS area.
  - Suggested radio call:

    "PAN PAN, PAN PAN, PAN PAN"

    "This is the vessel __________________. This is an emergency!"

    "I am the ____________ (engineer/deckhand) onboard"

    "Our position is ______________ (give geographic position, buoy number, river mile if known, or read Lat/Long position from GPS) and we have a ____________ (loaded/empty) oil/cargo barge."

    "Our Captain is incapacitated. I request that you advise vessels in our vicinity and I request assistance from any available vessel immediately."
- ❑ If medical attention is required, refer to the Medical Emergency response guidelines.
- ❑ Notify K-Sea Transportation LLC Duty Ops Manager as soon as practical.
- ❑ Submit incident report and obtain witness statements as appropriate per K-Sea Transportation LLC incident reporting procedures.

FLOODING/HULL FAILURE

- ❑ Sound general alarm; pass the word over PA if available.
- ❑ Muster crew and account for all personnel.
- ❑ Assess degree and extent of damage via visual observations, soundings, draft readings.
- ❑ Take preliminary action to stabilize situation as necessary (start de-watering/bilge pumps, secure watertight boundaries, closures, and air intakes, attempt to plug/repair breaches, etc.).
- ❑ Call for assistance. Call USCG on CH 16 VHF. Initiate PAN or MAYDAY broadcast on CH 13/16, 2182 KHz, and/or 4125 kHz; activate "Emergency" mode on DSC radio if so equipped. Notify VTS if in VTS area.
- ❑ Notify K-Sea Transportation LLC Duty Ops Manager as soon as practical.
- ❑ If extent and cause of damage is known, consider discharge of ballast to correct trim/list and increase buoyancy. DO NOT TAKE ACTION TO CORRECT TRIM OR LIST UNTIL THE REASON FOR THE TRIM OR LIST IS KNOWN.
- ❑ Consider and minimize pollution impacts as appropriate. Consider transferring fuel/cargo out of affected tanks to unaffected tankage.
- ❑ If near shore, consider intentional grounding to prevent complete sinking of the vessel.
- ❑ If at sea, consider course change to minimize effects of wind and sea on situation. Changing course to put the sea/swell off the quarter rather than square on the head or stern, or the beam ends will make an easier ride for the vessel.
- ❑ Submit incident report and obtain witness statements as appropriate per K-Sea Transportation LLC incident reporting procedures.

GROUNDING

- ❑ Sound general alarm; pass the word over PA if available.
- ❑ Muster crew and account for all personnel.
- ❑ Call for assistance. Call USCG on CH 16 VHF. Initiate PAN or MAYDAY broadcast on CH 13/16, 2182 KHz, and/or 4125 kHz; activate "Emergency" mode on DSC radio if so equipped. Notify VTS if in VTS area.
- ❑ Assess degree and extent of damage via visual observations, soundings, draft readings.
- ❑ Secure watertight boundaries, closures, air-intakes, etc.; attempt to plug/repair breaches if necessary.
- ❑ Consider anchoring or maneuvering as able to avoid being driven further ashore, but also consider effects of any pounding of the hull on bottom due to wave action.
- ❑ Notify K-Sea Transportation LLC Duty Ops Manager as soon as practical.
- ❑ Assess potential for pollution impacts. Consider deployment of containment boom if necessary and available.
- ❑ Consider state of tide or river level on situation.
- ❑ If grounding was light and no significant damage is detected, consider attempting to extract vessel from grounding under your own power.
- ❑ Administer drug/alcohol tests as directed by K-Sea Transportation LLC Duty Ops Manager.
- ❑ Submit incident report and obtain witness statements as appropriate per K-Sea Transportation LLC incident reporting procedures.

OIL/HAZARDOUS SUBSTANCE SPILL RESPONSE

Refer to the Spill Response Field Guide for additional information on communication procedures pertaining to oil/hazardous substance spills and subsequent containment and clean-up operations.

- ❑ Sound general alarm; pass word over PA system if available.
- ❑ Muster crew and account for all personnel.
- ❑ Ensure safety of personnel; establish safety and security zone. Don PPE.
- ❑ STOP THE DISCHARGE! Secure pumps, close valves, initiate damage control, tank-to-tank transfer, off-loading, or lightering.
- ❑ Eliminate fire hazards and sources of ignition.
- ❑ Assess spill volume, movement, weather, potential environmental effects.
- ❑ Notify K-Sea Transportation LLC Duty Ops Manager as soon as practical. If Duty Ops is not immediately available (within 30 minutes), notify Oil Spill Removal Organization (OSRO) or Primary Response Action Contractor (PRAC) directly.
- ❑ Initiate containment as appropriate; deploy boom, sorbents.
- ❑ If Duty Ops Manager and/or QI is not directly available (within 60 minutes) commence USCG and State agency notifications directly per the *Spill Response Field Guide*.
- ❑ For GASOLINE PRODUCTS, consider boom only for diversion of product away from hazards; consider dispersion or control with water spray or wheel wash.
- ❑ For recovery, deploy skimmer, sorbents as appropriate.
- ❑ Retain all recovered oil and sorbents for recovered oil determination.
- ❑ Decontamination: Stow all oiled boom and equipment within containment area for cleaning before re-stowing. Secure all disposable equipment and supplies for proper handling and disposal.
- ❑ Administer drug/alcohol tests as directed by K-Sea Transportation LLC Duty Ops Manager.
- ❑ Submit incident report and obtain witness statements as appropriate per K-Sea Transportation LLC incident reporting procedures.

LOSS OF CRITICAL SYSTEMS
(Electrical Power/Propulsion/Steering/Throttle Control)

- ❑ Ensure the Master is notified.
- ❑ Sound general alarm; pass the word over PA system if available.
- ❑ Muster crew and account for all personnel.
- ❑ Activate backup and/or emergency systems if available.
- ❑ Reduce engine speed and attempt to maintain control of vessel.
- ❑ Initiate broadcast on Bridge-to-Bridge radio (CH 13 VHF) and warn other traffic in area. Sound danger signal.
- ❑ Call for assistance as necessary. Initiate PAN or SECURITE broadcast on CH 13/16, 2182 KHz, and/or 4125 kHz. Notify VTS if in VTS area.
- ❑ Attempt to maneuver tug and tow to anchorage if able. Consider anchoring on tow wire if necessary.
- ❑ Display appropriate navigational signals, lights and day shapes.
- ❑ Notify K-Sea Transportation LLC Duty Ops Manager as soon as practical. The Duty Ops Manager establishes contact with USCG COTP.
- ❑ Troubleshoot and make repairs as able.
- ❑ Test systems and report results to K-Sea Transportation LLC Duty Ops Manager.
- ❑ Obtain clearance from USCG to proceed on voyage.
- ❑ Submit incident report and obtain witness statements as appropriate per K-Sea Transportation LLC incident reporting procedures.

LOST BARGE RETRIEVAL

Initial Action

- ❑ Sound general alarm; pass the word via PA system if available.
- ❑ Muster crew and account for all personnel.
- ❑ Recover remaining tow wire if applicable.
- ❑ Call for assistance as necessary. Initiate PAN or SECURITE broadcast on CH 13/16, 2182 KHz, and/or 4125 kHz. Notify VTS if in VTS area.
- ❑ Notify K-Sea Transportation LLC Duty Ops Manager as soon as practical. The Duty Ops Manager notifies USCG and State agencies.
- ❑ Plot position of barge and determine drift vector.
- ❑ Determine CPA and time of CPA to closest hazard or landfall on drift vector.
- ❑ Evaluate current and forecasted weather and sea conditions.
- ❑ Evaluate and select barge recovery method:
    - o *Direct Recovery* (calm/protected waters, can get tug alongside barge to transfer personnel and put up lines)
    - o *Emergency Tow Wire Recovery* (moderate conditions, restricted maneuvering area or shallow water, close proximity to land or hazards)
    - o *Retrieval Hook Recovery* (moderate to rough conditions, open water/ocean, barge drift vector proximity to land or hazards not a factor)

Go to next checklist based on selection of recovery method…

LOST BARGE RETRIEVAL
Direct Recovery

- ❑ Complete all Initial Action (first checklist) steps as applicable to situation.
- ❑ Muster and brief crew on retrieval plan.
- ❑ All deck crew don appropriate PPE.
- ❑ Prepare emergency towing hawser and connections as necessary.
- ❑ Provide boarding crewmembers with handheld radio w/ spare battery.
- ❑ Ready throw tires or other portable fendering.
- ❑ Ready heaving lines and messenger.
- ❑ Determine safest approach and landing to barge.
- ❑ Determine safest method of boarding crew (portable ladder, pocket ladders in hull, etc.).
- ❑ When crew is aboard barge, consider anchoring barge to slow or arrest drift until tow can be re-connected.
- ❑ Recover and tow to safe anchorage for permanent repairs to tow system.
- ❑ Cancel PAN or SECURITE broadcast as applicable. Notify VTS if in VTS area.
- ❑ Troubleshoot and make repairs as able.
- ❑ Test systems and report results to K-Sea Transportation LLC Duty Ops Manager.
- ❑ Obtain clearance from USCG to proceed on voyage (if necessary).
- ❑ Submit incident report and obtain witness statements as appropriate per K-Sea Transportation LLC incident reporting procedures.

LOST BARGE RETRIEVAL

Emergency Tow Wire Recovery

- ❑ Complete all Initial Action (first checklist) steps as applicable to situation.
- ❑ Muster and brief crew on retrieval plan.
- ❑ All deck crew don appropriate PPE.
- ❑ Prepare main tow wire or emergency tow hawser and connection shackles.
- ❑ Select approach to trailing line based on drift vector of barge, prevailing weather, and proximity to landfall or hazards.
- ❑ Pickup trailing line, haul aboard and recover break-out line.
- ❑ Take break-out line to capstan. Continue hauling in until wire is broken out of clips and D-socket is aboard tug.
- ❑ Connect main tow wire or emergency hawser to D-socket of emergency tow wire.
- ❑ Maneuver tug in front of barge while breaking emergency tow wire out of remaining clips.
- ❑ Resume tow to safe anchorage for permanent repairs to tow system.
- ❑ Cancel PAN or SECURITE broadcast as applicable. Notify VTS if in VTS area.
- ❑ Troubleshoot and make repairs as able.
- ❑ Test systems and report results to K-Sea Transportation LLC Duty Ops Manager.
- ❑ Obtain clearance from USCG to proceed on voyage (if necessary).
- ❑ Submit incident report and obtain witness statements as appropriate per K-Sea Transportation LLC incident reporting procedures.

LOST BARGE RETRIEVAL

Retrieval Hook Recovery

- ❑ Complete all Initial Action (first checklist) steps as applicable to situation.
- ❑ Muster and brief crew on retrieval plan.
- ❑ All deck crew don appropriate PPE.
- ❑ Prepare main or standby tow wire, or emergency tow hawser and connection shackles.
- ❑ Fake out and attach retrieval hook hawser to main or standby tow wire, or other suitable towing point on tug (tow wire "D", emergency hawser on H-bitt, surge chain around empty winch drum, etc.).
- ❑ Setup retrieval hook, suspension line and buoy.
- ❑ Select approach based on drift vector of barge and prevailing weather.
- ❑ While underway with slow headway, stream buoy, suspension line, retrieval hook, and hawser through tow pins. Note which direction "open" side of retrieval hook is facing.
- ❑ Approach barge so as to "wrap" the retrieval hook hawser across the tow chain with the open side of the hook toward the chain.
- ❑ If hook fails to grab chain on first pass, hook may have turned over during streaming. Try next approach with the other side of hook toward the barge.
- ❑ Upon hooking chain, note where hook has caught the chain and ensure chain is engaged properly in hook. If only the point of the hook has engaged a link of chain, the hook will probably fail during the tow. In this case, shorten the hawser and get the tug as close as possible to the bow of the barge, put a little slack in the hawser and try to get wave action and barge movement to shake the hook free of the chain and attempt to retrieve again.
- ❑ Resume tow to safe port; maintain steady pull on tow gear so as not to let the hook loose.
- ❑ Cancel PAN or SECURITE broadcast as applicable. Notify VTS if in VTS area.
- ❑ Submit incident report and obtain witness statements as appropriate per K-Sea Transportation LLC incident reporting procedures.

TERRORIST ACTIVITY

Underway

- ❑ Sound general alarm; pass the word via PA system if available.
- ❑ Muster crew and account for all personnel.
- ❑ Call for assistance. Call USCG on CH 16. Initiate PAN or MAYDAY broadcast on CH 13/16, 2182 KHz, and/or 4125 kHz; activate "Emergency" mode on DSC radio if so equipped. Notify VTS if in VTS area. Consider activating EPIRB based on severity of threat.
- ❑ Notify K-Sea Transportation LLC Duty Ops Manager as soon as practical.
- ❑ Assess response in event of attempted boarding. Get crew inside vessel, secure doors and hatches, and attempt evasive maneuvers.
- ❑ Attempt to restrict access to critical areas, i.e. engine room, wheelhouse.
- ❑ As situation warrants, cooperate with perpetrators to protect personnel.

Inport

- ❑ Sound general alarm; pass the word via PA system if available.
- ❑ STOP CARGO OPERATIONS.
- ❑ Muster crew and account for all personnel.
- ❑ Notify terminal using agreed protocol.
- ❑ Call for assistance. Call USCG on CH 16. Call 911 on phone if available. Initiate PAN or MAYDAY broadcast on CH 16; activate "Emergency" mode on DSC radio if so equipped. Notify VTS if in VTS area.
- ❑ Notify K-Sea Transportation LLC Duty Ops Manager as soon as practical.
- ❑ Initiate response for any specific casualty per these emergency response guidelines.

BOMB THREAT

- ❑ Ensure Master/VSO is notified.
- ❑ STOP CARGO OPERATIONS if applicable.
- ❑ If imminent threat is determined, sound general alarm; pass the word via PA system if available.
- ❑ Muster crew and visitors and account for all personnel.
- ❑ If you communicate with person making the bomb threat, ask:
  - Where is the bomb located?
  - When will it go off?
  - What type of a bomb is it?
  - Who/what are you trying to injure or damage? Why?
  - Who is responsible for the bomb?
- ❑ If inport and at a dock or terminal, and the tug or barge was named as the location of the bomb, evacuate the vessels immediately and establish a safety/security zone.
- ❑ Notify terminal using agreed protocol.
- ❑ Call for assistance if required. Call 911 on phone if shoreside and/or call USCG on CH 16. Initiate PAN or MAYDAY broadcast on CH 13/16, 2182 KHz, and/or 4125 kHz; activate "Emergency" mode on DSC radio if so equipped. Notify VTS if in VTS area. If underway, consider activating EPIRB based on severity of threat.
- ❑ Notify USCG National Response Center at 800-424-8802.
- ❑ Notify K-Sea Transportation LLC Duty Ops Manager as soon as practical.
- ❑ Monitor situation.
- ❑ Initiate response for any specific casualty per these emergency response guidelines.

SECURITY BREACH

Suspicious/Unattended Package

- ❑ Ensure Master/VSO is notified.
- ❑ Muster crew and visitors and account for all personnel.
- ❑ Check for identifying marks or labels; query all persons onboard as to any information about origin of package. If origin cannot be determined with certainty, treat as a security breach.
- ❑ Secure cargo operations if applicable.
- ❑ Evacuate immediate area and establish a safety/security zone.
- ❑ Notify terminal using agreed protocol.
- ❑ Call for assistance if required. Call 911 on phone if shoreside and/or notify local USCG via CH 16; advise of situation and request assistance as needed.
- ❑ Notify USCG National Response Center at 800-424-8802.
- ❑ Notify K-Sea Transportation LLC Duty Ops Manager as soon as practical.

Unauthorized Personnel

- ❑ Ensure Master/VSO is notified.
- ❑ Attempt to obtain identification from person and verify business with vessel.
- ❑ If person's identification or business with vessel cannot be determined with certainty, treat as security breach.
- ❑ Attempt to isolate or secure the person in a safe area.
- ❑ Secure cargo operations if applicable.
- ❑ Notify terminal using agreed protocol.
- ❑ Call for assistance if required. Call 911 on phone if shoreside and/or notify local USCG via CH 16; advise of situation and request assistance as needed.
- ❑ Notify USCG National Response Center at 800-424-8802.
- ❑ Notify K-Sea Transportation LLC Duty Ops Manager as soon as practical.

APPENDIX D – MSDS INFORMATION

Material Safety Data Sheet

Chevron Global Marine Products

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

DISTILLATE MARINE DIESEL (DMB)

Product Use: Fuel
Product Number(s): 32936
Synonyms: MARINE DIESEL OIL DMB
Company Identification
Chevron Marine Products LLC
1500 Louisiana Street
Houston, TX 77002
United States of America

Transportation Emergency Response
USA: CHEMTREC (800) 424-9300 or (703) 527-3887
Asia: +65 6883 1111
Health Emergency
Chevron Emergency Information Center: Emergency Information Centers are located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
Product Information
Product Information: USA: 832-854-6000
MSDS Requests: USA: 832-854-6000

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Fuel oil no. 4	68476-31-3	100 %weight

SECTION 3 HAZARDS IDENTIFICATION

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EMERGENCY OVERVIEW

- COMBUSTIBLE LIQUID AND VAPOR
- MAY CAUSE LUNG DAMAGE IF SWALLOWED
- CAUSES SKIN IRRITATION
- SUSPECT CANCER HAZARD - MAY CAUSE CANCER
- TOXIC TO AQUATIC ORGANISMS. MAY CAUSE LONG-TERM ADVERSE EFFECTS IN THE AQUATIC ENVIRONMENT

****

IMMEDIATE HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Contact with the skin causes irritation. Contact with the skin is not expected to cause an allergic skin response. Symptoms may include pain, itching, discoloration, swelling, and blistering. Not expected

to be harmful to internal organs if absorbed through the skin.
Ingestion: Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death. May be irritating to mouth, throat, and stomach. Symptoms may include pain, nausea, vomiting, and diarrhea.
Inhalation: Not expected to be harmful if inhaled.

DELAYED OR OTHER HEALTH EFFECTS:
Cancer: Prolonged or repeated exposure to this material may cause cancer.
See Section 11 for additional information. Risk depends on duration and level of exposure.

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: Wash skin with water immediately and remove contaminated clothing and shoes. Get medical attention if any symptoms develop. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person. If swallowed, get medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.
Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.
Note to Physicians: Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

SECTION 5 FIRE FIGHTING MEASURES

See Section 7 for proper handling and storage.

FIRE CLASSIFICATION:
OSHA Classification (29 CFR 1910.1200): Combustible liquid.

NFPA RATINGS: Health: 1 Flammability: 2 Reactivity: 0

FLAMMABLE PROPERTIES:
Flashpoint: (Pensky-Martens Closed Cup) 61.5 °C (143 °F) Minimum
Autoignition: 263 °C (505 °F)
Flammability (Explosive) Limits (% by volume in air): Lower: No data available Upper: No data available

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO_2) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: Liquid evaporates and forms vapor (fumes) which can catch fire and burn with explosive force. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above 29C (85F).
Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Wash thoroughly after handling.
General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.
General Storage Information: DO NOT USE OR STORE near heat, sparks, flames, or hot surfaces . USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
Skin Protection: Wear protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted. Suggested materials for protective gloves include: Chlorinated Polyethylene (or Chlorosulfonated Polyethylene), Nitrile Rubber, Polyurethane, Viton.
Respiratory Protection: No respiratory protection is normally required.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.
Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
Fuel oil no. 4	ACGIH	100 mg/m3	--	--	Skin A3 total hydrocarbon

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Brown
Physical State: Liquid
Odor: Petroleum odor
pH: Not Applicable
Vapor Pressure: No data available
Vapor Density (Air = 1): No data available
Boiling Point: 160°C (320°F) - 450°C (842°F)
Solubility: Soluble in hydrocarbons; insoluble in water
Freezing Point: Not Applicable
Specific Gravity: <1 @ 15.6°C (60.1°F) / 15.6°C (60.1°F)
Density: 900 kg/m3 @ 15°C (59°F) (Max)
Viscosity: 11 mm2/s @ 40°C (104°F) Maximum

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS
Eye Irritation: The eye irritation hazard is based on evaluation of data for similar materials or product components.
Skin Irritation: The skin irritation hazard is based on evaluation of data for similar materials or product components.
Skin Sensitization: The skin sensitization hazard is based on evaluation of data for similar materials or

product components.
Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
This material is expected to be toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment.

ENVIRONMENTAL FATE
This material is not expected to be readily biodegradable. The biodegradability of this material is based on data for a similar material.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: GAS OIL, COMBUSTIBLE LIQUID, UN1202, III

IMO/IMDG Shipping Description: NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORTATION UNDER THE IMDG CODE

ICAO/IATA Shipping Description: NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORTATION UNDER ICAO

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES:

1. Immediate (Acute) Health Effects: YES
2. Delayed (Chronic) Health Effects: YES
3. Fire Hazard: YES
4. Sudden Release of Pressure Hazard: NO
5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK

02=NTP Carcinogen	06=NJ RTK
	07=PA RTK

The following components of this material are found on the regulatory lists indicated.

Fuel oil no. 4	01-2B, 04, 07

CHEMICAL INVENTORIES:
All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), EINECS (European Union), TSCA (United States).

WHMIS CLASSIFICATION:
Class B, Division 3: Combustible Liquids
Class D, Division 2, Subdivision A: Very Toxic Material - Carcinogenicity
Class D, Division 2, Subdivision B: Toxic Material - Skin or Eye Irritation

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 1 Flammability: 2 Reactivity: 0

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

REVISION STATEMENT: This is a new Material Safety Data Sheet.
Revision Date: March 06, 2007

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	MSDS - Material Safety Data Sheet
CVX - Chevron	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Chevron Energy Technology Company, 100 Chevron Way, Richmond, California 94802.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date

hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

CPChem **Material Safety Data Sheet**

115/145 AVIATION GASOLINE

March 31. 1993

MSDS #: 41440

CHEVRON PHILLIPS CHEMICAL COMPANY LP
1301 McKinney Street
Houston, Texas 77010-3030

PHONE NUMBERS
EMERGENCY: (800) 231-0623 or
(510) 231-0623 (International)
EMERGENCY RESPONSE (ASIA): 800-AlertSGC
or 800-25378477 or 65-542-9595
TRANSPORTATION (24 HR): CHEMTREC
(800)424-9300 OR (703)527-3887
Technical Services: (713) 289-4862
For Additional MSDSs: (800) 852-5530

A. Product Identification

Synonyms: 115/145 AVGAS; Aviation Check Fuel 115/145; Aviation Fuel
Chemical Name: Mixture
Chemical Family: Hydrocarbon
Chemical Formula: Mixture
CAS Reg. No.: Mixture
Product No.: MF2100

Product and/or Components Entered on EPA's TSCA Inventory: YES

This product is in U.S. commerce, and is listed in the Toxic Substances Control Act (TSCA) Inventory of Chemicals; hence, it may be subject to applicable TSCA provisions and restrictions.

B. Components

Ingredients	CAS Number	% By Wt.	OSHA PEL	ACGIH TLV
Tetraethyl lead	78-00-2	< 1	10 ppm**	10 ppm
Toluene	108-88-3	NE	100 ppm	100 ppm
Isooctane	26635-64-3	25	NE	NE
C7-C8 Isoparaffins	70024-92-9	11	NE	NE
Isopentane	78-78-4	10	NE	NE
n-Butane	106-97-8	3	800 ppm	800 ppm

* As lead, skin notation.
** Areas covered by the Benzene Standard, 29 CFR 1910.1028, will have a 1 ppm 8 hour TWA and 5 ppm STEL.

C. Personal Protection Information

Ventilation: Use adequate ventilation to control exposure below recommended levels.

Respiratory Protection: For concentrations exceeding the recommended exposure level, use NIOSH/MSHA approved air purifying respirator.

When entry into or exit from concentrations of unknown exposure, use NIOSH/MSHA approved self-contained breathing apparatus (SCBA).

Eye Protection: Use safety glasses with side shields and face shield for splash protection.

Skin Protection: Use gloves resistant to the materials being used (Viton, nitrile, neoprene). Use full-body, long sleeved garments to prevent skin contact.

NOTE: Personal protection information shown in Section C is based upon general information as to normal uses and conditions. Where special or unusual uses or conditions exist, it is suggested that the expert assistance of an industrial hygienist or other qualified professional be sought.

D. Handling and Storage Precautions

Do not get in eyes, on skin or on clothing. Do not breathe vapors, mist, fume or dust. Do not swallow. May be aspirated into lungs. Wear protective equipment and/or garments described in Section C if exposure conditions warrant. Wash thoroughly after handling. Use only with adequate ventilation. Launder contaminated clothing before reuse.

Keep away from heat, sparks, and flames. Store in a well-ventilated area. Store in tightly closed container. Bond and ground during transfer.

E. Reactivity Data

Stability: Stable
Conditions to Avoid: Not Applicable
Incompatibility (Materials to Avoid): Oxygen and strong oxidizing agents

Hazardous Polymerization: Will Not Occur
Conditions to Avoid: Not Applicable

Behavioural signs of hearing loss were observed in rats exposed to toluene subchronically at levels of 1000 ppm or more. Comparable effects have not been reported in humans.

Other Health Effects:

Combustion, a normal use of gasoline, results in an exhaust that has been associated with skin cancer in laboratory animals. Skin cancer was observed in these animals when exhaust was concentrated and repeatedly applied to the skin. It is unknown if this route of exposure is relevant to human exposure.

Combustion (burning) of most carbon-containing material forms carbon monoxide. Carbon monoxide inhalation may cause carboxyhemoglobinemia. Chronic exposure to carbon monoxide causes fatigue, poor memory, loss of sensation in fingers, visual disturbances and insomnia. Carboxyhemoglobinemia is frequently misdiagnosed as flu.

Sensitive sub-populations to the inhalation of carbon monoxide exist. Carbon monoxide displaces oxygen in the bloodstream and therefore, can adversely effect people with pre-existing heart disease, pregnant women and smokers.

Fuels containing lead anti-knock compounds should be handled in such a way to minimize contact with the body. Lead can accumulate in the body with overexposure and cause illness due to effects on the blood, nerves, kidneys and the reproductive system.

A Toxicity Study Summary for Aviation Gasoline is available upon request.

Health Hazard Categories:

	Animal	Human		Animal	Human
Known Carcinogen	X	X	Toxic		
Suspect Carcinogen			Corrosive		
Mutagen	X		Irritant		
Teratogen			Target Organ Toxin	X	X
Allergic Sensitizer			Specify - Blood Toxin; Reproductive Toxin-Embryo/Fetotoxin; Lung-Aspiration Hazard		
Highly Toxic					

First Aid and Emergency Procedures:

Eye: Flush eyes with running water for at least fifteen minutes. If irritation or adverse symptoms develop, seek medical attention.

Skin: Wash skin with soap and water for at least fifteen minutes. If irritation or adverse symptoms develop, seek medical attention.

Inhalation: Remove from exposure. If breathing is difficult, give oxygen. If breathing ceases, administer artificial respiration followed by oxygen. Seek immediate medical attention.

Ingestion: Do not induce vomiting. Seek immediate medical attention.

Note to Physician: Gastric lavage using a cuffed endotracheal tube may be performed at your discretion.

G. Physical Data

Appearance:	Purple liquid
Odor:	Mild
Boiling Point:	95-338F (35-170C)
Vapor Pressure:	5.5 - 7.0 psia @ 100F (38C)
Vapor Density (Air = 1):	3-4
Solubility in Water:	Negligible
Specific Gravity (H2O = 1):	0.70 - 0.71 @ 60/60F (16/16C)
Percent Volatile by Volume:	100
Evaporation Rate (Butyl Acetate = 1):	> 1
Viscosity:	Not Established

H. Fire and Explosion Data

Flash Point (Method Used):	<-35F (-37C) (Estimated)
Flammable Limits (% by Volume in Air):	LEL - 1.5 UEL - 7.6
Fire Extinguishing Media:	Dry chemical, foam or carbon dioxide (CO2)
Special Fire Fighting Procedures:	Evacuate area of all unnecessary personnel. Wear appropriate safety equipment for fire conditions including NIOSH/MSHA self-contained breathing apparatus (SCBA). Shut off source, if possible. Water fog or spray may be used to cool exposed containers and equipment. Do not spray water directly on fire - product will float and could be reignited on surface of water.
Fire and Explosion Hazards:	Carbon oxides and various hydrocarbons formed when burned. Gasolines containing Tetraethyl Lead will form lead fumes when burning. Highly flammable vapors which are heavier than air may accumulate in low areas and/or spread along ground away from handling site. Flashback along vapor trail may occur.

I. Spill, Leak and Disposal Procedures

Precautions Required if Material is Released or Spilled:
Evacuate area of all unnecessary personnel. Wear protective equipment and/or garments described in Section C if exposure conditions warrant. Shut off source, if possible and contain spill. Protect from ignition. Keep out of water sources and sewers. Absorb in dry, inert material. Transfer to disposal drums using non-sparking equipment.

Waste Disposal (Insure Conformity with all Applicable Disposal Regulations):
Incinerate or otherwise manage in a RCRA permitted waste management facility.

J. DOT Transportation

Shipping Name:	Gasoline
Hazard Class:	3 (Flammable liquid)
ID Number:	UN 1203
Packing Group:	II
Marking:	Gasoline, UN 1203, Marine Pollutant (Gasoline, leaded)*
Label:	Flammable liquid
Placard:	Flammable/1203
Hazardous Substance/RQ:	Not applicable
Shipping Description:	Gasoline, 3 (Flammable liquid), UN 1203, PG II, Marine Pollutant (Gasoline, leaded)*
Packaging References:	49 CFR 173.150, 173.202, 173.242

* Marine pollutant mark and shipping paper notation required for all bulk domestic shipments and for non-bulk shipments by water.

K. RCRA Classification - Unadulterated Product as a Waste

Ignitable (D001)

Prior to disposal, consult your environmental contact to determine if TCLP (Toxicity Characteristic Leaching Procedure, EPA Test Method 1311) is required. Reference 40 CFR Part 261.

L. Protection Required for Work on Contaminated Equipment

Contact immediate supervisor for specific instructions before work is initiated. Wear protective equipment and/or garments described in Section C if exposure conditions warrant.

M. Hazard Classification

_X_ This product meets the following hazard definition(s) as defined by the Occupational Safety and Health Hazard Communication Standard (29 CFR Section 1910.1200):

___ Combustible Liquid
___ Compressed Gas
___ Flammable Gas
_X_ Flammable Liquid
___ Flammable Solid
___ Flammable Aerosol
___ Explosive
_X_ Health Hazard (Section F)
___ Organic Peroxide
___ Oxidizer
___ Pyrophoric
___ Unstable
___ Water Reactive

___ Based on information presently available, this product does not meet any of the hazard definitions of 29 CFR Section 1910.1200.

N. Additional Comments

SARA 313

This product contains the following chemical or chemicals subject to the reporting requirements of Section 313 of T
itle III of the
Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. (See Section B).

Benzene
Toluene

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APPENDIX E – WEATHER INFORMATION

Average Weather Data

Average Temperature: 85-90
Average Precipitation: .... 5”

NOAA and U.S. Navy weather information will be the primary weather information source. Routine weather forecast information will be relayed to the Incident Commander on a daily basis, augmented by immediate reports for severe weather. The most likely weather that could affect operations includes; high winds, tsunamis, and lightning strikes in the vicinity of Pago Pago.

d. **High Winds:** In the event of high wind warnings the Incident Commander will direct pumping operations to cease. Operational assets will secure for the anticipated weather**.** The tug *El Lobo Grande* will be positioned so as to assist the Tank Barge *Capella* ride out the ensuing frontal passage or if necessary get underway. The T-ATF will take precautionary measures as deemed appropriate by the Master or as directed by operational headquarters.

e. **Tsunamis:** In the event of a tsunami warning the decision to ride out the storm in harbor or get underway will be dependent on factors such as time available before anticipated arrival and the anticipated effect expected in Pago Pago. In the event where inadequate warning times are available to conduct a planned response to a tsunami, personnel safety will be priority. Prior to evacuating the barge toward the high ground in the vicinity of the Governors house located across the street from the fuel pier, every effort will be made to secure the pump and topside hose valves.

f. **Thunder Storms/Lightening:** Pumping operations shall cease if thunder storms or lightening are present within 5 miles of the operational area. Point of contact, FAA Smitty Lutu 699-2958

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APPENDIX F – DIAGRAMS AND FUEL DOCK LAYOUT

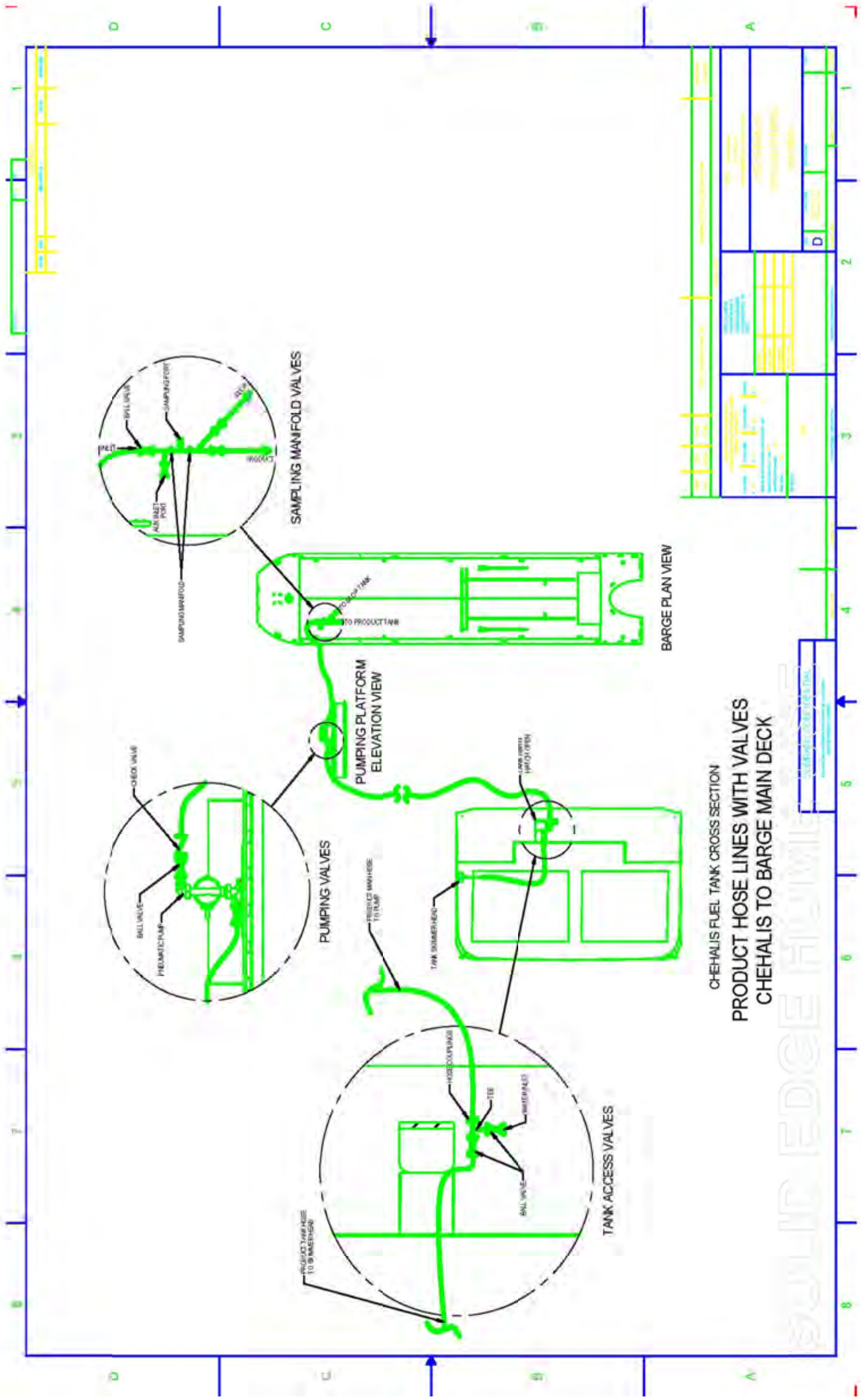

Figure 1. Hose Line Diagram

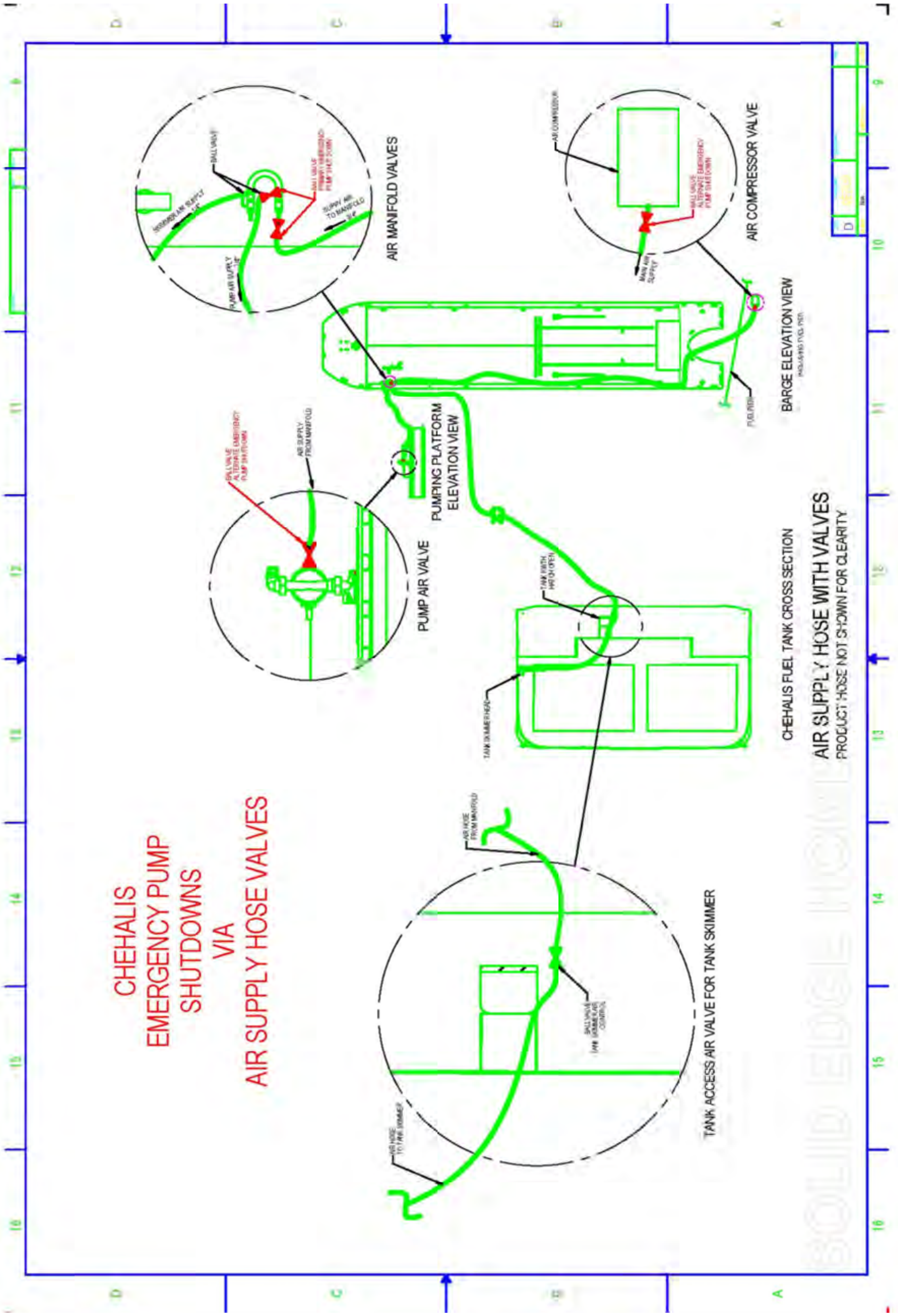

Figure 2. Emergency Pump Shutoff Diagram

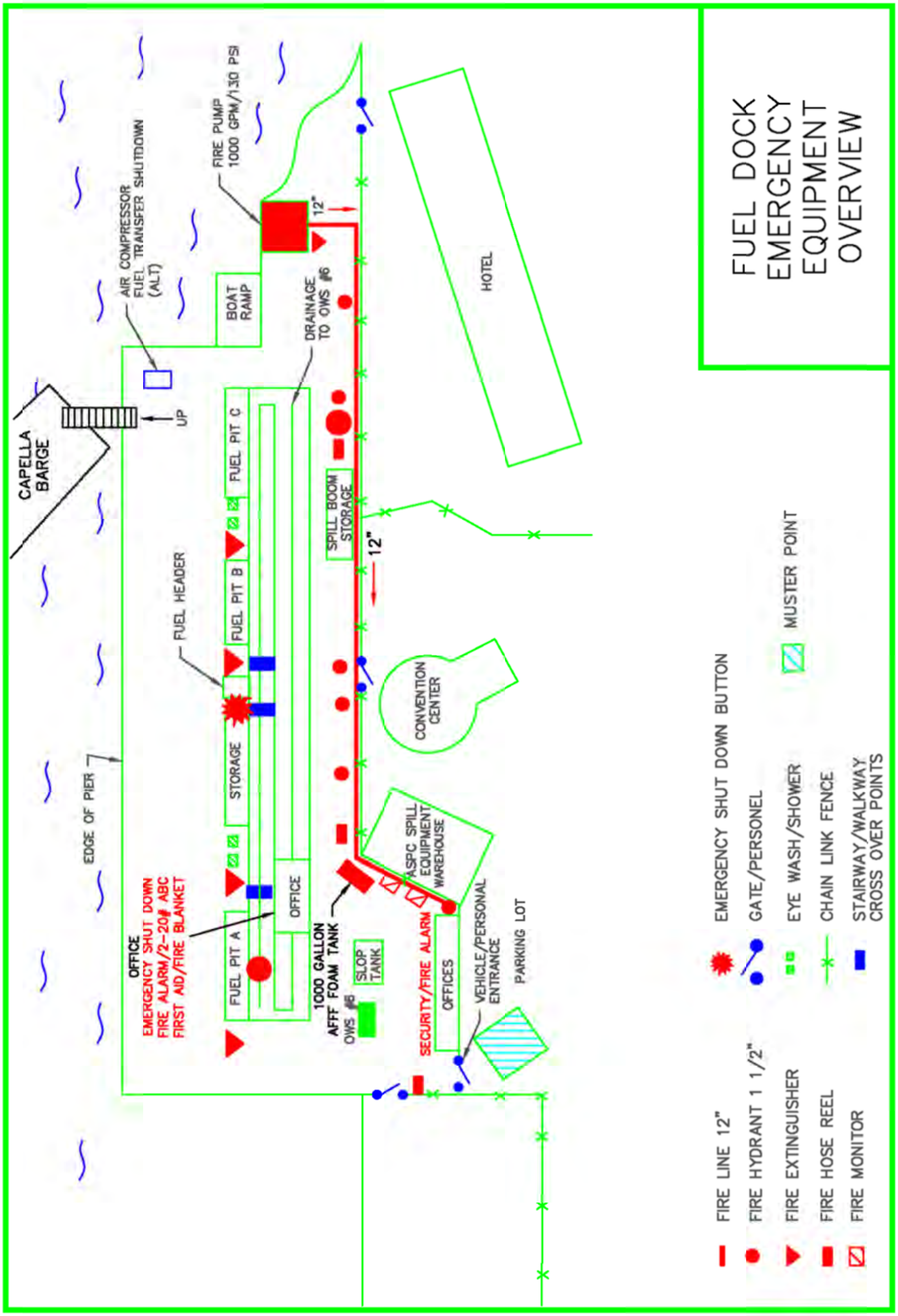

Figure 3. Fuel Dock Layout

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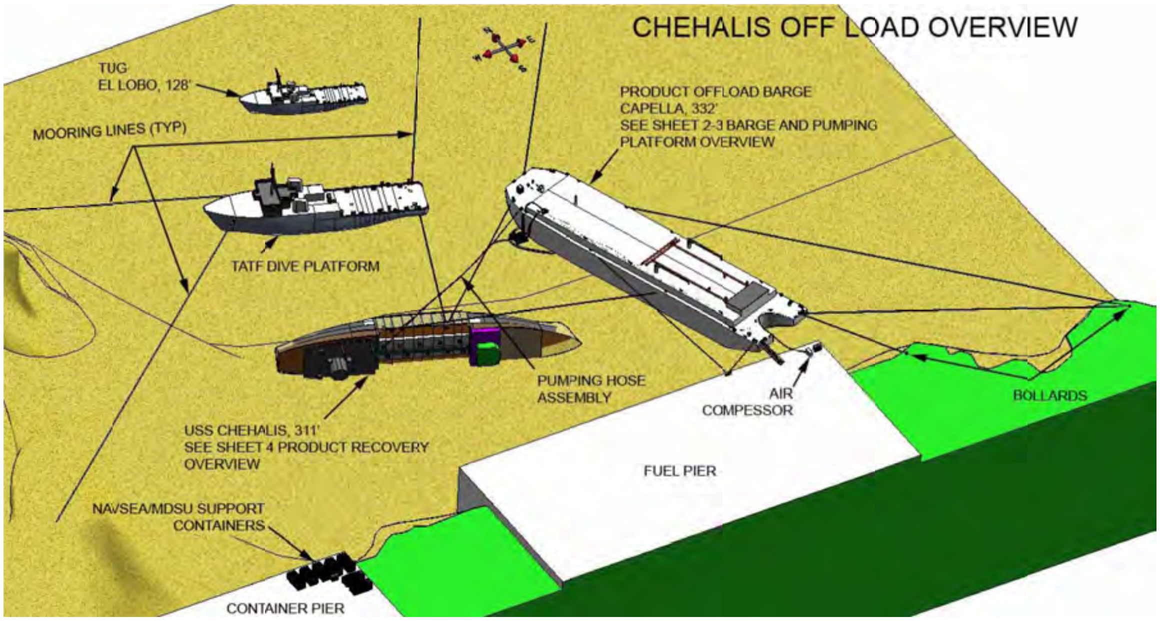
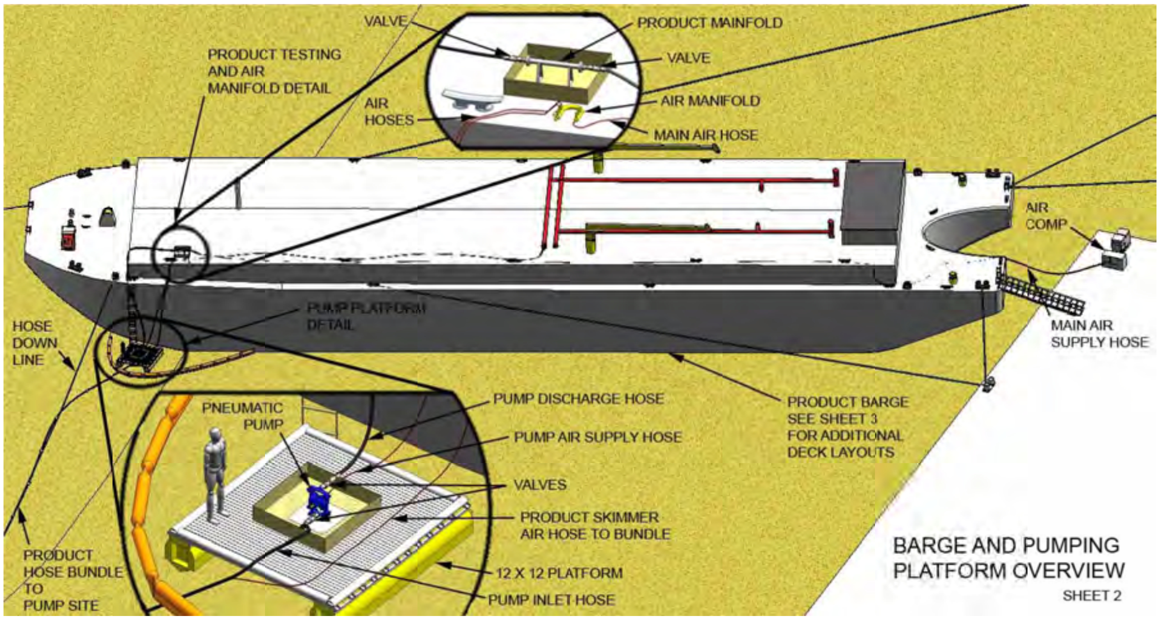
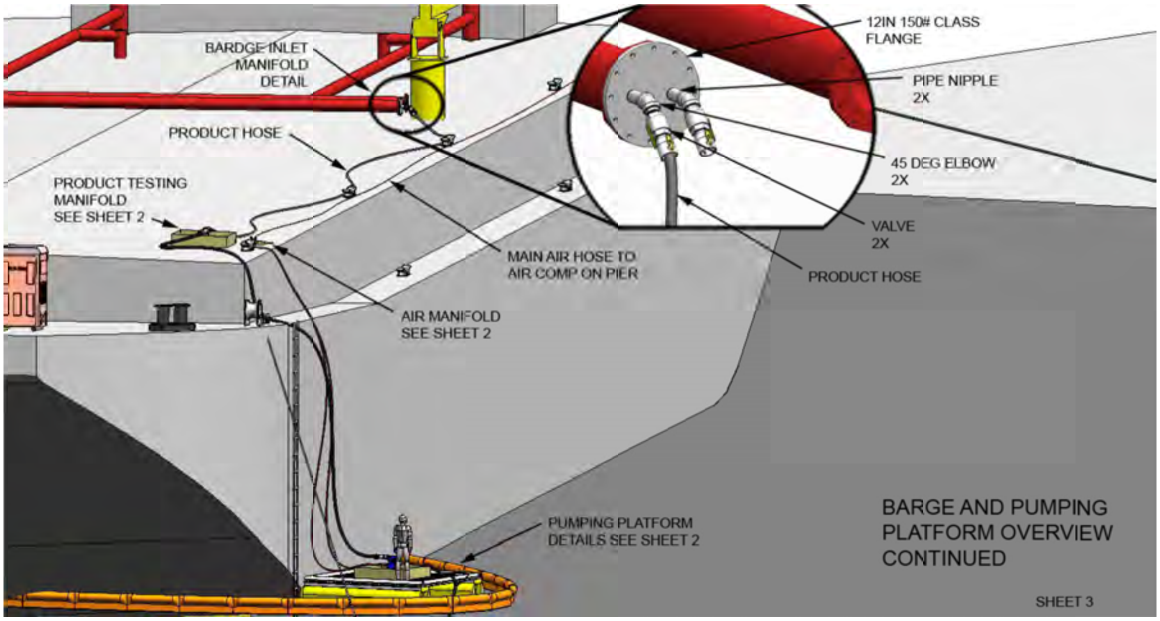
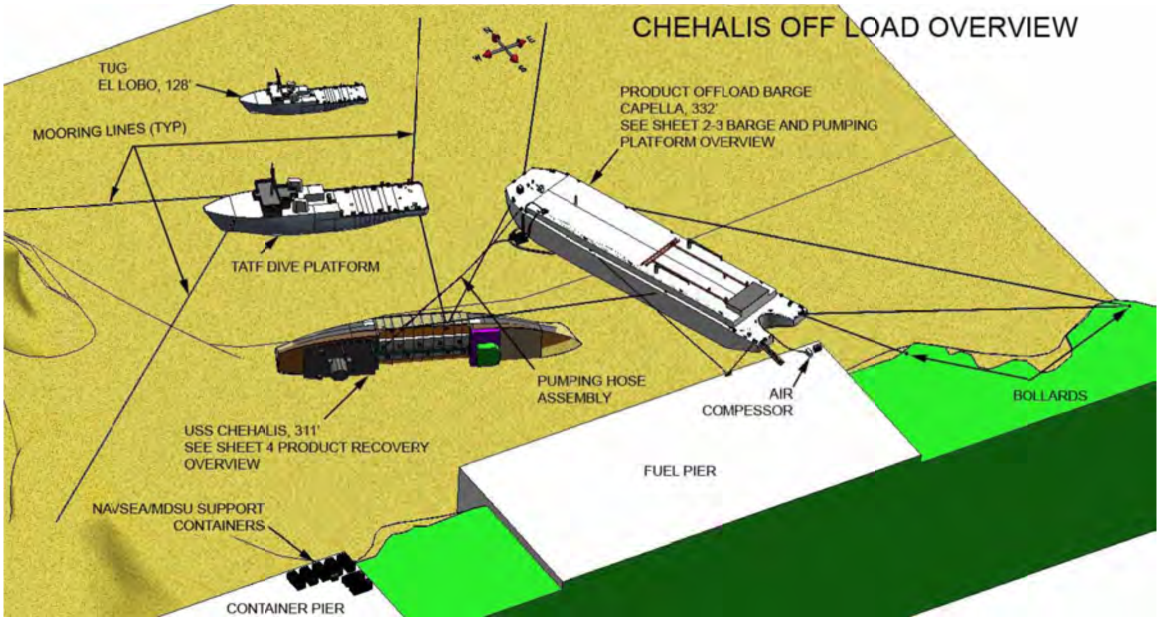
APPENDIX G – GENERAL PROJECT LAYOUT DIAGRAMS






BARDGE INLET MANIFOLD DETAIL
12IN 150# CLASS FLANGE
PIPE NIPPLE 2X
PRODUCT HOSE
45 DEG ELBOW 2X
PRODUCT TESTING MANIFOLD SEE SHEET 2
VALVE 2X
MAIN AIR HOSE TO AIR COMP ON PIER
PRODUCT HOSE
AIR MANIFOLD SEE SHEET 2
PUMPING PLATFORM DETAILS SEE SHEET 2
BARGE AND PUMPING PLATFORM OVERVIEW CONTINUED
SHEET 3


CHEHALIS OFF LOAD OVERVIEW
TUG
EL LOBO, 128'
MOORING LINES (TYP)
PRODUCT OFFLOAD BARGE
CAPELLA, 332'
SEE SHEET 2-3 BARGE AND PUMPING
PLATFORM OVERVIEW
TATF DIVE PLATFORM
PUMPING HOSE
ASSEMBLY
AIR
COMPRESSOR
BOLLARDS
USS CHEHALIS, 311'
SEE SHEET 4 PRODUCT RECOVERY
OVERVIEW
FUEL PIER
NAVSEA/MDSU SUPPORT
CONTAINERS
CONTAINER PIER

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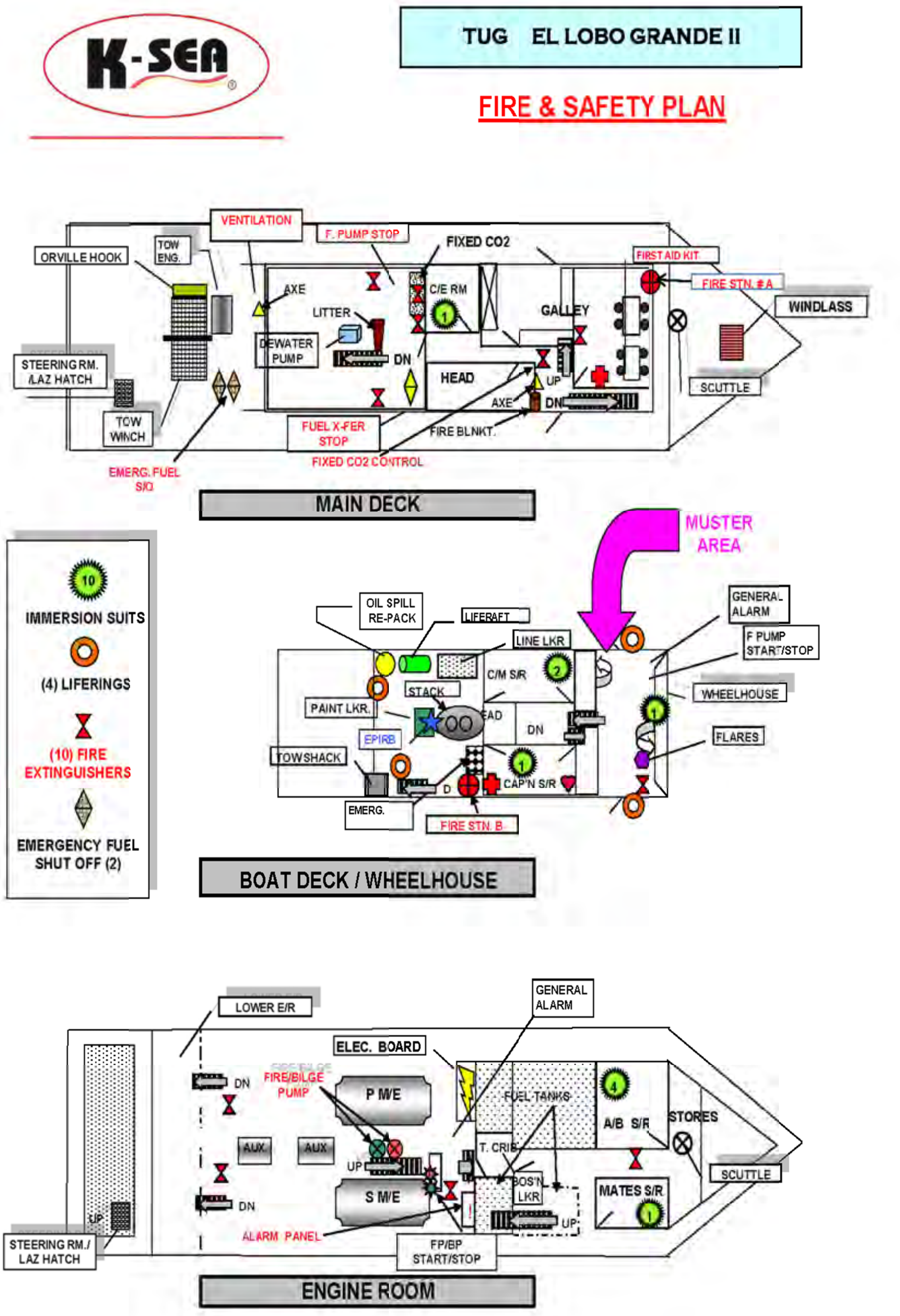
APPENDIX H *EL LOBO GRANDE* FIRE AND SAFETY PLAN DIAGRAM



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