1.0 INTRODUCTION
In September 2009, an aboveground storage tank located in the fuel tank farm on Kwajalein Island had an accidental release of approximately 2,065 gallons of diesel through the bottom of the tank. Additional leaks of several thousand gallons were documented in 2010 and 2011 at two other tanks that stored JP-5 jet fuel. Older leaks from other tanks and associated piping between the 1950s and 2000s are suspected, but undocumented.

Groundwater beneath the site lies at depths of about 4 feet below the ground surface. The site is located in the industrial area of the island; the nearest residences are almost 1 mile away. The site groundwater is not used for drinking water, but small amounts of groundwater from the site may be discharging into the lagoon. The areas investigated are shown in the following figure.

2.0 CONTAMINATION NATURE AND EXTENT
From 2010 to 2012, site investigators characterized the site by collecting soil and groundwater samples. Results show that fuel contamination remains in primarily three distinct areas at the site as shown in the following figure.

The primary contamination identified in soil and groundwater include petroleum hydrocarbons (gasoline [GRO] and diesel [DRO] compounds), and to a lesser extent, volatile organic compounds and polycyclic aromatic hydrocarbons. Hydrocarbons were measured to be floating on top of groundwater at a maximum thickness of 0.2 foot.

Most of the shallow soils in the contaminated area outside of the spill areas have lower levels of contamination than the deeper soils near the groundwater. Over time, the tidal effects on the groundwater spread the fuel over a wider area and much of the fuel is trapped in the soil.

The proposed area for remediation, located in the following figure, is the largest area that showed the most contamination in soil and groundwater during the investigation. This area is the main (fuel) tank farm.
3.0 CLEANUP APPROACH

Remediation activities will begin following physical removal of as much fuel floating on the groundwater as possible. The preferred cleanup approach will be conducted by enhanced aerobic bioremediation. Bioremediation of the soil and groundwater will lessen the impacts to the lagoon and marine environments.

Natural attenuation (breakdown of the hydrocarbons in the fuel), or bioremediation, requires the continued presence of bacteria, nutrients, oxygen, and moisture. The data collected during the site investigation indicate that natural attenuation at the site is limited because the available nutrients and oxygen needed by the bacteria to consume the hydrocarbons have been depleted.

With the addition of supplemental nutrients (fertilizer) and oxygen (air) to the groundwater at the site, naturally occurring bioremediation of hydrocarbons in the soil and groundwater would be accelerated. The natural tidal effects would also help move and flush the petroleum contamination out of the soil.

Groundwater will be extracted from specific wells and then injected back into the groundwater after supplementing the water with air and nutrients. The groundwater will be pumped upgradient (away from the lagoon) to injection wells located along the southwest and southeast side of the main tank farm.

The advantages of recirculating the groundwater in this manner to remediate the soil and water include minimizing the disturbance of the site; creating minimal wastes; using minimal energy; and destroying contaminants in-place by enhancing a naturally-occurring process.

4.0 MONITORING AND OPERATION OF THE SYSTEM

The injection rates of nutrients and oxygen will be monitored, particularly at the start-up of the system. The injection rates will be modified as necessary so the bacteria can effectively metabolize the hydrocarbons in the fuel by supplying the proper ratios of nutrients and oxygen to the groundwater.

The concentration of the fuels in the groundwater will be monitored throughout the operation of the bioremediation system to verify when the fuels reach the desired cleanup levels. The cleanup goals for groundwater will be compared to the U.S. Army Kwajalein Atoll Environmental Standards maximum contaminant limits, and Pacific Basin Environmental Screening Levels for compounds not listed in the U.S. Army Kwajalein Atoll Environmental Standards.

The Army plans to begin the remediation efforts in 2013.

5.0 SITE INFORMATION REPOSITORIES

The Draft Document of Environmental Protection, January 2013, is currently available for public review and comments. The U.S. Army Kwajalein Atoll will address public comments received at the closing of the comment period, and will then seek approval for remediation projects from the Republic of the Marshall Islands Environmental Protection Agency, the U.S. Environmental Protection Agency, The U.S. Fish & Wildlife Service, the U.S. National Marine Fisheries Service, and the U.S. Army Corps of Engineers. This document can be found at the following locations:

- U.S. Army Kwajalein Atoll Grace Sherwood Public Library (on Kwajalein)
- U.S. Army Kwajalein Atoll Roi-Namur Library (on Roi-Namur)
- Republic of the Marshall Islands Environmental Protection Authority Office (on Majuro)
- Republic of the Marshall Islands Environmental Protection Authority Office (on Ebeye)

Computer users with internet access can download documents and information related to the cleanup activities at the U.S. Army Kwajalein Atoll Cleanup website (www.usakacleanup.info).

Questions about the site cleanup plan can be directed by phone to the U.S. Army Kwajalein Atoll (USAKA) Public Affairs Office, (805) 355-1404.

Written comments on the Draft Document of Environmental Protection (DEP-12-001.0) for the Kwajalein Tank Farm Site can be made one of three ways:

1) through the www.usakacleanup.info comment portal under the Additional Documents portion of the site, or
2) emailed to comments@usakacleanup.info, or
3) mailed to WHPacific, Inc.; Attn: Kwajalein Tank Farm Remediation Plan Comments; APO, AP 96555.

All comments must be received by May 27, 2013.