SITE-SPECIFIC HEALTH & SAFETY PLAN

PRELIMINARY ENDANGERMENT ASSESSMENT
MODESTO JUNIOR COLLEGE WEST CAMPUS
FORMERLY USED DEFENSE SITE
HAMMOND GENERAL HOSPITAL
2201 BLUE GUM AVENUE
MODESTO, CALIFORNIA

Project No. 014-06256
July 14, 2008

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1.0 INTRODUCTION

This Site-Specific Health & Safety Plan describes the health and safety procedures for the activities planned for the Preliminary Endangerment Assessment (PEA) at the Modesto Junior College West Campus (MJCWC), 2201 Blue Gum Avenue, in Modesto, California. All Krazan & Associates, Inc. (Krazan) employees and field personnel will abide by this plan. It is intended that all project work will comply with applicable codes and regulations of the United States Occupational Safety and Health Administration (OSHA) in accordance with Title 8 California Code of Regulations Section 5192 (8 CCR 5192). Each field team member working on this project will have the general responsibility to identify and correct any health and safety hazards and strive to make the workplace safe.

1.1 Project Description

This project is a Preliminary Endangerment Assessment (PEA) in conformance with California EPA Department of Toxic Substances Control (DTSC) oversight to be conducted by Krazan at the project site. At the request of Kitchell CEM (Kitchell), Krazan & Associates, Inc. (Krazan) has prepared a Workplan for the Preliminary Endangerment Assessment (PEA) for proposed redevelopment areas at the Modesto Junior College West Campus (MJCWC) that is located on the Formerly Used Defense Site (FUDS)- Hammond General Hospital (HGH). The scope of work outlined in the Workplan is based on the findings of Krazan's Preliminary Conceptual Site Model (PCSM) prepared for the Yosemite Community College District (YCCD) dated February 11, 2008; a site visit by Krazan and the California Environmental Protection Agency (Cal EPA) Department of Toxic Substances Control (DTSC) representatives on March 17, 2008; and the DTSC's comments on the PCSM in its letter dated March 26, 2008, prepared by Mr. Lance McMahan with the DTSC's Office of Military Facilities and Mr. Michael Finch with the Geologic Services Unit (GSU) of the DTSC.

The objective of the PCSM was to provide a conceptual understanding of the potential for exposure to constituents of concern (CoCs) as they relate to six Operable Units (OUs) that are planned for redevelopment at MJCWC. The purpose of he PCSM was to identify and describe the sources of the contamination, areas of concern (AOCs), constituents of concern (CoCs), release/transport mechanisms, possible migration routes, and the potential receptors, as well as historical uses of the site, cleanup concerns, current site conditions, and future land use plans. The six OUs are identified for the purposes of the PCSM and the Workplan as:

- Agricultural Modular Living Units project area (OU1-Ag Housing);
- Allied Health & Life Science Building project area (OU2-Allied Health);
- Agricultural Multi-Purpose Pavilion Facility project area (OU3-Ag Pavilion);
- Softball Complex project area (OU4-Softball Complex);
- Agricultural Beef Unit (OU5-Beef); and
- Alternate Softball Complex (OU6-Alternate Softball Complex)

According to DTSC records, the former on-site HGH is listed as a military site which needs further evaluation in order to determine the potential for impacts to the subsurface. Potential contaminants associated with the former HGH include mercury, solvents, formalin, fuels, waste oils, x-ray wastes (silver, lead shields), paints (various metals, solvents), pesticides, dioxins, furans, polychlorinated biphenyls (PCBs), chemical warfare materials, and asbestos. Potential releases may have occurred from USTs, leaking transformers, direct disposal to the ground, incineration, leakage from wastewater collection systems, the wastewater treatment plant disposal ponds, and sludge drying beds. Mr. Lance McMahan with the DTSC is the project manager for the former HGH.

Generally, the scope of the project will include the advancement and sampling of soil borings, drilling and installation of monitoring wells, advancement of soil gas probes and sampling, and geophysical investigations at the subject property. Sample labeling, preparation, shipment and analyses will also be conducted.

1.2 Key Personnel & Responsibilities

The following personnel will have the overall responsibility for the safe operation of this investigation:

Project Directors:	Dean Alexander
Corporate Safety Officer:	Dean Alexander
Task Leaders:	William Cooper
On-site Safety Task Leader:	William Cooper

It is the responsibility of the above-designated safety officers and task leaders to:

- Implement, the site safety training program for all project field team members as described in this document.
- Assure that all field personnel have read and understand this Health & Safety Plan.
- Establish effective traffic and pedestrian control around the subject site.
- Ensure that adequate site security is maintained.
- Perform workplace surveillance for flammable/explosive conditions and ensure that a portable fire extinguisher is located on-site.
- Observe activities to ensure the proper use of personal protective equipment such as hard hats, protective eyewear, coveralls (Tyvek®, etc.) respirators, gloves, and steel-toe boots, etc.
- Inspect safety equipment for use by all field personnel to ensure that it has been maintained and is in a useable condition.
- Shut down or modify field work activity based on the criteria presented in Section 11.0 of this document.
- Initiate outside emergency phone calls when an emergency or accident requires medical attention.
- Ensure that all field personnel meet or exceed the minimum requirements for health and safety training, medical monitoring, and respiratory fit testing as required by OSHA 29 CFR 1910.120.

All field personnel will have a responsibility to:

- Read, understand, and follow this plan.
- Perform work safety.
- Cooperate with all safety personnel.
- Report any unsafe conditions to the immediate supervisor.
- Be aware and alert for signs and symptoms of potential exposure to site contaminants and health concerns.
- Attend the site safety training program/meeting.
- Ensure drilling equipment and other machines are properly inspected and maintained in compliance with applicable sections of the California and United States Occupational Health and Safety Codes.
- Maintain safety related protective equipment such as hard hats, Tyvek® coveralls (or equivalent), gloves, safety eyewear, respirators, etc., as specified in this plan.

2.0 HAZARD EVALUATION

This Health & Safety Plan addresses specific on-site work activities related to the collecting of samples and data from the project site.

Based on the limited historical and technical data available, this plan covers anticipated activities and hazards, and makes provision for modification or amendment as health-related data is obtained during this investigation. This plan will be amended with site-specific hazards identified as posing a potential health hazard for workers. For select sites, the Safety Officer will conduct a preliminary survey involving air and bulk solid sample analysis, and amend the Health & Safety Plan as needed.

As analytical data becomes available, the information will be evaluated by a Health & Safety Task Leader. Appropriate action in the form of Work/Health & Safety Plan modifications will be initiated by the Safety Officer or the Health & Safety Task Leader.

The anticipated activities of this investigation will include:

- The advancement and sampling of soil borings using direct-push Geoprobe, straight flight, and hollow stem auger.
- Installation of monitoring wells using a hollow stem auger drilling rig.
- Direct reading hydrocarbon monitoring (using the photoionization detector - PID) of boring head and ambient concentrations during drilling activities.
- Collection of samples for chemical analysis.
- Sample preparation packaging and shipment of samples for chemical analysis.
- Analysis of selected samples by subcontracted laboratories (not covered under this plan).

The general categories of hazards associated with this investigation are:

- *Mechanical hazards*: cuts, contusions, slips, trips, falls, being struck by moving objects, being caught by rotating objects; also muscular injury potential caused by overexertion or improper movement (e.g. back injury due to improper lifting, etc.).
- *Electrical hazards*: possible excavation of buried cables, exposure to overhead power lines, wet electrical cords, etc.
- *Chemical hazards*: exposure to chemicals/contaminants listed in Section 4.0 of this plan and exposure to extraction solvents, etc.
- *Fire hazards;* possible excavation of buried utilities, flammable petroleum hydrocarbons, equipment fires, etc.
- *Thermal (heat stress) hazards*: exposure to outside temperature extremes and/or increased body temperatures while wearing protective clothing/equipment etc.
- *Acoustical hazards*: exposure to excessive noise created by drilling operations and/or related to the site-specific operations, etc.
- *Routine job-related hazards* in the subcontractor's laboratory. Neither these hazards nor any activities performed in the subcontractor's laboratory are covered by this plan.

Job hazard analyses associated with most major work activities are presented in the following sections.

2.1 Direct-Push, Straight Flight, Hollow Stem Auger Drilling, and Other Heavy Equipment Use

Direct-push, straight-flight, hollow stem auger drilling, and other heavy equipment use activities will potentially expose field personnel to the following hazards:

Chemical hazards:

- Exposure to various chemical substances, including but not limited to petroleum hydrocarbon liquids and vapors, and petroleum contaminated soils, sludge or liquids. Certain precautions may be necessary to properly control the potential fire/explosion/health hazards associated with these chemicals. (See Sections 3.1 and 4.0)

Physical hazards:

Potential exposures to physical hazards associated with hollow-stem auguring and other heavy equipment use include the following:

- Snapping cables
- Brush, equipment, gas-main, or hydrocarbon fires
- Being hit by equipment
- Becoming entwined in rotating tools
- Falling objects
- Exposure to excessive noise
- Exposure to outside temperature extremes.
- Exposure to the potential for heat exhaustion due to protective clothing
- Slips, trips, and falls
- Overhead utility hazards
- Injury due to using improper tool for the job

Buried cables and underground utility hazards:

- Electrical hazards associated with potentially encountering buried cables.
- Fire hazards associated with potentially excavating buried utilizes.

As a precaution to avoid potential buried hazards to on-site workers, Underground Services Alert (U.S.A.) must be contacted prior to subsurface investigative activities in accordance with state regulations.

2.2 Heat Stress/Stroke

During day-to-day field work, the on-site engineer/geologist and/or safety officer will be alert for the signs and symptoms of heat stress. Hazard exists when individuals are required to work in warm or hot temperatures while wearing protective clothing. When the ambient air temperature exceeds 85°F, heat stress may become a problem. For an unacclimatized person this temperature may be less. If these conditions are encountered, the following precautions will be taken: The on-site geologist/engineer or safety officer will regularly monitor the ambient air temperature.

Field team members will be observed for the following signs and symptoms of heat stress (i.e., heat exhaustion/heat stroke):

Heat Exhaustion

- Profuse sweating
- Skin color change
- Increased heart rate
- Vision problems
- Heat cramps

Any team member who exhibits any sign or symptom of heat exhaustion will be removed immediately from field work, be requested to remove impervious clothing, and consume electrolyte fluid or cool water while resting in a shaded area. The individual will be instructed to rest until the symptoms are no longer recognizable. If the symptoms appear critical, persist or get worse, immediate medical attention will be sought.

Heat Stroke

- Hot, dry, unusually red skin
- Delirium
- Elevated temperature of 103-105°F
- Convulsions

Any team member who exhibits any sign or symptom of heat stroke will be removed immediately from field work and be requested to remove impervious clothing, be immersed in cool water and immediate medical attention will be sought.

2.3 Noise

While working around drilling equipment, the potential exists for exposure to excessive noise. If noise levels are known/believed to exceed 85 dBA-08 hours per day, all individuals will be instructed to use adequate hearing protectors (earplugs). Random monitoring using a noise dosimeter will be used to document noise levels. All field team members will be given background and annual evaluations. All field team members have been/will be trained in noise hazards and how to wear the protective equipment.

2.4 Sampling for Chemical Analysis

Samples will be collected for the purpose of observation and soil logging. Additionally, selected samples may be submitted for chemical analysis. Some samples may contain high levels of hazardous materials creating the potential for chemical inhalation exposure, skin contact and possibly even ingestion. These activities may pose one of the greatest risks of chemical exposure for the site assessment workplan. Appropriate worker training, protective measures and medical monitoring will be enforced to control this health hazard potential.

2.5 Packaging and Shipment of Samples

After the samples have been collected in sample containers, they will be properly packaged to protect shipping personnel. The hazards associated with shipping samples are minimal, provided care is taken to prevent the containers from leaking or breaking. Additionally, sample containers will be plainly marked in case of exposure.

2.6 Sample Preparation and Analysis

The preparation of samples for analysis may expose the technician to routine hazards associated with laboratory work. Standard laboratory safety procedures should be used to prepare and analyze these samples. The samples should be treated carefully and handled inside a properly operating fume hood due to their potentially volatile and hazardous nature. In the event of a mishap, the laboratory supervisor should be notified immediately.

3.0 SAFE WORK PRACTICES AND LEVEL OF PERSONAL PROTECTION

The following sections present procedures on how to adequately address the primary potential hazards encountered in the different tasks of this project. The standard level of personal protection is also defined.

Based on the work to be conducted and the type of chemical hazards that may be encountered, EPA Level D personal protection has been determined to be adequately protective and suitable for most of the tasks in this project. Certain tasks may require a higher level of protection, such as air-purifying or air-supplied respirators. These determinations will be made by the Safety Officer or Safety Task Leader and will be specified as amendments to this section of the plan.

3.1 Potential Fire/Explosion Hazard

Due to the flammable nature of the hydrocarbons, explosive vapor conditions will be carefully monitored by the Krazan task leader. Lower explosive limit (LEL) measurements will be taken using the PID and documented. The LEL for gasoline hydrocarbons is approximately 1.4% in air. Using a 10-fold safety factor, a working criteria of 1400 ppm (10% LEL) as measured by a PID is established for explosion hazards. When measurements obtained near the bore hole reveal this concentration, or above, work will be stopped. Additionally, the field crew will be instructed to stay upwind until these concentrations diminish.

3.2 Potential Health Hazards

Depending on the conditions encountered, the Task Leader in coordination with the Project Safety Officer may increase or decrease the level of personal protection required of all field team members. Such decisions will be made based on initial and periodic measurement of breathing zone concentrations of petroleum constituents by PID and on other data collected as work is conducted on a given site.

Generally speaking, EPA Level D Personal Protection will be in accordance with the following guidelines:

- Krazan technician uniform
- Hard hat
- Safety glasses
- Earplugs (as required)
- Steel-toe boots.

Some general guidelines representing EPA Level C personal protection that may be used are:

- Tyvek® coveralls (or equivalent), neoprene boots and rubber gloves to be worn by any personnel who handle contaminated drilling equipment.
- Individuals at drilling sites not directly exposed to contaminated soils or liquids may not need to wear Tyvek® coveralls due to the increased hazards of heat stress when wearing this type of clothing.
- Latex or PVC disposable gloves should be worn under butyl rubber or nitrile gloves to provide an extra measure of hand protection when handling heavily contaminated soils and water samples.

- Chemical splash goggles will be worn when increased splash hazards exist, such as steam cleaning activities or during or the handling of contaminated liquid samples.
- Respiratory protection will be worn during drilling activities which have the potential to expose workers to hazardous levels of airborne contaminants. Direct-reading personal breathing zone monitoring will be performed. The criteria established for the use of respiratory protection are discussed in Section 4.0 of this document.

3.3 Potential Heat Stress Hazards

During conditions when the temperature, humidity, and/or radiant heat are high and air movement is low, the following procedures will be followed to prevent heat stress hazards for workers wearing protective clothing/equipment:

- Work activity will be limited to reduce the amount of heat naturally produced by the body. Alternating work and rest periods will be used in high potential conditions. For example, in moderately hot conditions, 5 minute rest breaks in the shade with 60-minute work periods in the sun may be desirable. Under severe conditions, the duration of rest periods will be increased as necessary.
- Heavy work will be conducted during the cooler periods of the day when feasible.
- Under heat stress conditions, special attention will be given toward assuring that workers replace lost body fluids. Adequate supplies of cool drinking water or electrolyte solution will be provided by each company for their own employees' use. Workers will be instructed in the need to replace the fluids throughout the working day.
- Special care and attention will be paid to field crew members that may not be acclimatized to the area.

3.4 Potential Noise Hazards

Exposure to excessive noise will be controlled by issuance and use of hearing protection as instructed by the Task Leader or Safety Officer. Noise levels will be periodically monitored by the Safety Officer.

4.0 CONSTITUENTS OF CONCERN/CHEMICAL HAZARDS EVALUATION

In May 2007, limited soils and groundwater investigations involving soil, soil vapor and groundwater sample collection and analysis were conducted as an initial screen for the presence of hazardous substances on the MJCWC. Minor concentrations of several chemical compounds have been identified to be present in some of the soil, soil vapor and groundwater samples previously collected and analyzed in 2007 at MJCWC. Additional constituents of concern (CoCs) have been discussed as potentially being present in the MJCWC subsurface based upon its historical uses as a former military hospital installation during WWII and subsequent use as a state mental hospital. Table 1 summarizes the CoCs which may be encountered during the proposed sampling and analysis as part of the PEA, their toxicological properties and relevant occupational exposure limits. The following paragraphs discuss the potential for the listed CoCs to represent a hazard to on-site workers. This rationale is based upon consideration of documented historical on-site hazardous-materials-related activities at the various operational-unit areas of concern (AoCs) planned for investigation on the MJCWC in conjunction with evaluation of the May 2007 sampling and analytical results. In those instances

where CoCs are considered to represent a health and safety hazard to on-site workers, exposure monitoring and control methods are addressed.

TABLE 1
SUMMARY OF CONSTITUENTS OF CONCERN - MJCWC

Constituent of Concern	OSHA PEL/STEL (ppm)	Route of Entry	Symptoms of Exposure	Target Organs
VOLATILE PETROLEUM HYDROCARBON CONSTITUENTS (PHCs)				
Benzene	1.0 / 5.0	Inh, Ing, Skin, Eye	Irritation of eyes, skin, nose, resp. sys., headache, nausea	Eyes, skin, resp. sys., blood, CNS, bone marrow
Toluene	200 / 300	Inh, Ing, Skin, Eyes	Irritation of eyes, nose, fatigue, weakness, dizziness, confusion, headache	Eyes, skin, resp. sys., CNS, liver, kidneys
Ethylbenzene	100 / -	Inh, Ing, Skin, Eyes	Irritation of eyes, skin, muc. memb., headache, coma	Eyes, skin, resp. sys., CNS
Xylenes	100 / -	Inh, Ing, Skin, Eyes	Irritation of eyes, skin, nose, throat, dizziness, excitement, staggering, nausea, vomiting, abdominal pain	Eyes, skin, resp. sys., DNS, GI tract, blood, liver, kidneys
Methane	- / - (A concentration limit is not included because the limiting factor is the available oxygen)	Inh	Gas or vapor when present in high concentrations acts primarily as an asphyxiant without other adverse effects.	

VOLATILE PETROLEUM HYDROCARBON CONSTITUENTS (PHCs) (cont.)				
Gasoline	- / -	Inh, Ing, Skin, Eyes	Irritation of eyes, skin, mucous membranes, headache, fatigue, blurred vision, dizziness, slurred speech, convulsions	Eyes, skin, resp. sys., CNS, liver, kidneys
VOLATILE ORGANIC COMPOUNDS (VOCs)				
PCE (perchloroethylene, tetrachloroethylene))	100/200 (ceiling) 300 (5-min. max. peak in any 3 hrs.)	Inh, Ing, Skin, Eyes	Irritation of eyes, nose, throat, nausea, flushed face & neck, vertigo, dizziness, incoherence, headache	Eyes, skin, resp. sys., liver, kidneys, CNS
TCE (trichloroethylene)	25 ppm (10-hr. TWA, NIOSH)	Inh, Ing, Skin, Eyes	Irritation of eyes, nose, throat, nausea, flushed face & neck, vertigo, dizziness, incoherence, headache	Eyes, skin, resp. sys., liver, kidneys, CNS
SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)				
Chlorodiphenyl (42% chlorine)/ Polychlorinated biphenyls (PCBs)	1 mg/cubic meter/ -	Inh, Ing, Skin, Eyes	Irritation to eyes, liver damage, reproductive effects, potential carcinogen	Skin, eyes, liver, reproductive system
METALS				
Arsenic	0.010 mg/cubic meter/ -	Ing, Ing, Skin, Eyes	Ulceration of nasal septum, irritation of skin, GI disturbances	Liver, kidneys, skin, lungs, lymphatic system

METALS (cont.)				
Chromium	0.5 mg/cubic meter/ -	Ing, Inh, Skin	Irritation to skin and respiratory tract	Eyes, skin, respiratory system
Chromium (VI)	0.005 mg/cubic meter/ -	Inh, Ing, Skin	Irritation to skin and respiratory tract	Eyes, skin, respiratory system
Lead	0.050 mg/cubic meter/ -	Inh, Ing	AI distress, kidney failure, weakness, insomnia, constipation, abdominal pain	Eyes, GI tract, CHS, kidneys, blood, gingival tissue
Mercury	0.05 mg/cubic meter (NIOSH: vapor/skin) 0.1 mg/cubic meter (NIOSH ceiling/skin)/ -	Inh, Ing, Eyes, Skin	Irritation to eyes, skin, cough, chest pain, pneumonitis	Eyes, skin, resp. sys., CNS, kidneys
ORGANOCHLORINE PESTICIDES (OCPs)				
DDE (dichlorodiphenyldichloroethylene)	0.25 mg/cubic meter	Ing, Ing, Eyes, Skin	Irritation of skin	Carcinogenic
DDT 1,1,1-trichloro-2,2-bis-(p-chlorophenyl)ethane	1.0 mg/cubic meter/ -	Inh, Ing, Skin, Eyes	Neuro-physiological effects, asthma, diabetes,	CNS, resp. sys., liver, carcinogenic
Chlordane	0.5 mg/cubic meter (skin)/ -	Inh, Ing, Skin	Blurred vision, delirium, cough, abdominal pain, nausea, vomiting,	CNS, eyes, lungs, liver, kidneys

OTHER COCs				
Asbestos	1 fiber (airborne, >5 micrometers, 8-hr. TWA)/ -	Inh, Ing, Eyes	Asbestosis (chronic exposure), irritation to eyes	Resp. sys., eyes (lung cancer)
Dioxins		Ing, Inh		Carcinogenic/ immune and reproductive system damage
Formalin (37% formaldehyde aqueous solution)	0.75/2.0	Inh, Ing, Skin, Eyes	Irritation to eyes, nose, throat, resp. sys., cough	Eyes, skin, resp. sys (nasal cancer)
Furans		Ing, Ing		Carcinogenic/immune and reproductive system damage
x-ray waste (silver)	0.01 mg/cubic meter/ -	Inh, Ing, Skin, Eyes	Irritation to eyes, nasal septum, throat, skin	Nasal septum, skin, eyes
CHEMICAL WARFARE AGENTS (CWAs)				
Nerve agents: organo-phosphorus compounds	- / -	Inh, Skin, Eyes	Irritation and damage to skin, eyes, internal organs, CNS	Skin, eyes, internal organs, resp. sys., CNS
Mustard agents: sulfur and nitrogen	- / -	"	"	"
Hydrogen cyanide	- / -	"	"	"
Arsenic compounds	- / -	"	"	"
PERCHLORATE EXPLOSIVES				
Perchlorate, nitroaromatics, nitramines, sodium, potassium, sulfur				
Sulfuric acid	1 mg/cubic meter (PEL)/ 3 mg/cubic meter (STEL)	Inh, Ing, Eyes, Skin	Irritation to eyes, resp. sys., mucous membranes, skin	Eyes, resp. sys., mucous membranes, skin

Inh = Inhalation
Ing = Ingestion
Skin = Skin contact
Eye = Eye contact
CNS = Central nervous system
GI = gastro-intestinal
PEL = Permissible exposure limit
STEL = Short-term exposure limit
ppm = parts per million (vapor)

Source: Title 8 CCR Section 5192/Cal-OSHA Table AC-1; NIOSH Guide to Chemical Hazards

4.1 Volatile Petroleum Hydrocarbon Constituents (PHCs)

PHCs represent the most common CoCs in numerous AoCs on the MJCWC. It is reported that various fuels were stored and utilized on site. Areas where fuel was specifically stored would represent the potential for the presence of the highest residual concentrations of volatile PHCs in soil and groundwater based upon potential spills and/or storage tank leaks. However, other AoCs where sampling and analysis will be conducted for PHCs represent a significantly lower potential for the presence of high residual concentrations because of presumed dilution related to disposal through sewage treatment and landfill facilities or transmission through sewer pipelines. In all cases, natural attenuation of these organic compounds is likely to have occurred over the decades since the MJCWC was formerly utilized for military and hospital applications. Furthermore, previous sampling and analysis of soils and groundwater in 2007 resulted in no findings of BTEX, TPH-G, TPH-D, MTBE, or TRPH above regulatory action levels. Consequently, the following AoCs where sampling and analysis for PHCs will be conducted are anticipated to represent a minimal hazard to on-site workers:

- Former sewage treatment plant T-154
- Former sewage treatment effluent ponds within the OU5-Beef Unit Project Area
- Soil beneath sewer and storm drain lines on and adjacent to operable units proposed for redevelopment
- Former incinerator T-155 located within the OU1-Ag Housing Project Area
- Landfill that is reportedly located within 1,000 feet of OU1-Ag Housing and OU3-Ag Pavilion Project Areas.

Based upon the reported storage of large quantities of heating oil fuel and the absence of previous investigative sampling and laboratory analytical data, the following AoC is anticipated to have a reasonable potential to represent a vapor hazard to on-site workers if significant quantities of PHCs are discovered:

- Possible UST(s) (buried railroad car used for fuel storage at the former HGH boiler house building T-117) located northwest of OU2-Allied Health Project Areas and adjacent to the north of the OU6-Alternate Baseball Complex.

Exposure to elevated levels of hydrocarbon vapors presents potential health risks that must be addressed. Work practices and methods will be used to limit exposures. Where elevated exposures persist, respiratory protection will be used to protect personnel from inhalation of hydrocarbon vapors. The hydrocarbon vapors expected to be encountered during the field portion of the investigation of the possible UST/buried railroad car AoC are composed of a variety of volatile refined petroleum constituents. Most of these chemicals have limited toxicity thus requiring minimal controls at the concentrations that are anticipated to be encountered. Additionally, all drilling and sampling activities will be conducted in outdoor open spaces. However, there are

certain components, primarily benzene vapors, that present significant toxicological hazards and must be properly controlled. Based upon data for previous analysis of groundwater and soil samples collected in 2007 on the MJCWC, benzene comprised between approximately 1% and 7% of the total hydrocarbon constituents in samples analyzed. Therefore, based on the approximate percentage of benzene represented in the 2007 previous investigation data, workers could potentially be exposed to benzene above the Cal-OSHA permissible exposure limit (PEL) when total volatile hydrocarbons (TVH) exceed approximately 14 ppm, based on a simple box model. Consequently, criteria are presented below for the use of respiratory protection based on the need to limit potential exposures to benzene.

In a situation where the potential exists for between 1% to 7% of the TVH to be comprised of benzene, a 14 ppm concentration of TVH would result in a potential breathing zone level of approximately 1.0 ppm benzene with the use of a half-face respirator. This level is equal to the current OSHA PEL of 1.0 ppm for an 8-hour occupational exposure to benzene. Based on the Cal-OSHA PEL of 1.0 ppm and the assigned protection factor for a half-face respirator of 10, the maximum concentration of benzene allowable in an atmosphere where a half-face respirator is worn is 10 ppm. Given that benzene concentrations could potentially represent as much as 7% of the total TVH in an atmosphere, a limit of 14 ppm TVH is proposed as the maximum acceptable TVH level of exposure without respiratory protection. A Mini Rae® PID will be used to measure total hydrocarbon levels of the sample. When sample levels are above 14 ppm TVH, breathing zone concentrations will be monitored and documented every 15 minutes. When a persistent level of 14 ppm TVH is noted to exist at the breathing zone, an appropriate respirator will be donned by that field team member.

When possible, to assure benzene exposures are below a 1 ppm limit, Dräger® benzene detector tubes may be used if PID measurements of the breathing zone concentrations indicated persistent TVH levels above 140 ppm. These detector tubes are not compound-specific and may respond to other less-hazardous petroleum hydrocarbons such as toluene, xylenes and ethylbenzene. In the event that benzene detector tube measurements indicate that levels exceed 10.0 ppm benzene in the breathing zone, work will be stopped and procedures will be undertaken to subdue excessive vapor levels. This is considered a conservative approach since the Dräger® detector tubes may respond to several hydrocarbons other than benzene.

Table 2 summarizes potential TVH and benzene concentrations and appropriate responses to prevent exposure to resultant benzene vapor hazards above safety limits.

TABLE 2
HYDROCARBON VAPOR CRITERIA AND RESPONSES

HYDROCARBON CONCENTRATIONS	RESPONSE
< 14 ppm TVH	Limited hazard, no special action.
14-140 ppm TVH general work areas	Half-mask OV respirators worn by all potentially exposed in work area.
> 140 ppm TVH general work areas and/or well head emissions	Half-mask OV respirators worn by all potentially exposed in work area. Benzene detector tube measurements taken each 15 minutes to verify benzene levels below 10 ppm in the breathing zone.
> 10 ppm benzene at breathing zone	Work stops; procedures undertaken to subdue excessive vapor levels.

ppm = parts per million (vapor)
TVH = total volatile hydrocarbons
OV = organic vapor

In addition to inhalation exposure pathways, because exposure pathways to workers from target CoCs may involve dermal exposure, ingestion and contact with the eyes, these hazards will be controlled by proper use of PPE (gloves, safety glasses, footwear, clothing) during drilling, sample collection and sample packaging activities as deemed necessary by the on-site Safety Task Leader and personal hygiene practices including thorough hand washing as well as the designation of a clean area for eating and drinking.

4.2 Volatile and Semivolatile Organic Compounds (VOCs & SVOCs)

Based upon the historical uses of the MJCWC as a military hospital, it is likely that on-site activities which utilized hazardous materials would have primarily been associated with medical operations and the reported self-sufficiency of the facility and attendant patients and staff, i.e., fuels for generation of steam, wastewater treatment, potential landfill solid waste disposal, facilities and equipment maintenance procedures, etc. However, it is possible that a component of historical on-site operations may have included other military activities typical of warfare and defense operations during WWII. Therefore, the potential storage, use and disposal of VOCs and SVOCs (differentiated from previously discussed volatile PHC constituents) has been discussed resulting in proposed soil, soil vapor and groundwater investigation for these constituents at most of the AoCs as part of the PEA scope of work. Typical constituents may have included solvents such as TCE and PCE and PNAs and PCBs related to cooling, lubrication and insulation fluids, and fuels. However, none of the AoCs where sampling and analysis will be conducted for VOCs and SVOCs appear to represent a significant potential for the presence of high residual concentrations because of presumed dilution related to disposal through sewage treatment and landfill facilities or transmission through sewer pipelines and the presumed effects of natural attenuation of these organic compounds likely to have occurred over the decades since the MJCWC was formerly utilized for military and hospital applications. The possible exception may be the

potential for elevated PCBs resulting from leaks in those areas where electrical transformers have historically been located. Furthermore, previous sampling and analysis of soils and groundwater in 2007 in similar AoCs on MJCWC resulted in non-detect (ND) findings for all VOCs and SVOCs. Consequently, residual concentrations of VOCs and SVOCs which may be revealed during sampling activities on the MJCWC as part of the PEA scope of work are not expected to pose an exposure hazard to on-site workers. However, because exposure pathways to workers from these CoCs may involve dermal exposure, ingestion and contact with the eyes, these hazards will be controlled by proper use of PPE (gloves, safety glasses, footwear, clothing) during drilling, sample collection and sample packaging activities as deemed necessary by the on-site Safety Task Leader and personal hygiene practices including thorough hand washing as well as the designation of a clean area for eating and drinking.

4.3 Methane

A reported former landfill in the northern portion of the MJCWC comprises an AoC as part of the PEA workplan. Methane gas is a potential by-product of the historical presence of the reported landfill which could represent a potential hazard to on-site workers if methane gas is detected in significant concentrations. Because there is no record of previous characterization of the extent of the reported landfill, the PEA scope of work includes a geophysical survey and potential limited excavation by trenching across the suspected landfill area in order to define the depth and lateral limits of the landfill. In May 2007, a limited methane assessment was conducted which included the collection and analysis of soil gas samples from the approximate eastern and western boundaries of the reported landfill location and adjacent to the former burn pit location. Analytical results of the samples collected indicated very low concentrations of methane gas and carbon dioxide in addition to moderate levels of oxygen. Therefore, results of this limited initial investigation suggest that high concentrations of methane gas were not present in the vicinity of the approximate eastern and western boundaries of the reported landfill area and adjacent to the former burn pit. Consequently, it does not appear that highly elevated concentrations of methane gas are anticipated at these AoCs on MJCWC. All drilling and sampling activities will be conducted in outdoor open spaces. However, as a safety measure to monitor the potential hazard of exposure to elevated concentrations of methane gas to on-site workers, the work area where sampling is conducted will be monitored with an approved combustible gas meter to detect the presence of potentially harmful flammable atmospheres. In the event that hazardous methane gas levels are detected, appropriate PPE including respirators will be required of on-site workers.

4.4 Chemical Warfare Agents

The presence of a former on-site gas chamber structure has been identified in conjunction with the historical use of the MJCWC as a military hospital facility during WWII. Chemical warfare agents utilized during WWII involved exploiting the toxic properties of chemical substances to kill, injure or incapacitate an enemy. These

agents may have been in liquid, gaseous or solid form. Many chemical agents were designed to be volatile so they could be dispersed over a large region quickly. However, persistent agents, such as non-volatile or oily substances, tended to remain in the environment for longer periods of time, complicating decontamination. Therefore, sampling and analysis of the MJCWC subsurface in the area reported to have been associated with the former gas chamber are included in the PEA scope of work. Because of the highly toxic nature of potential chemical warfare agents which may be present in samples proposed to be collected, as an added precaution, an Industrial Hygienist will supervise collection of soil gas and soil samples within areas suspected for chemical warfare agents to ensure that appropriate safety measures are incorporated to mitigate potential hazards to on-site workers. Because exposure pathways to workers from these CoCs may involve dermal exposure, ingestion, inhalation, and contact with the eyes, these hazards will be controlled by proper use of PPE (gloves, safety glasses, respirators, footwear, protective clothing) during drilling, sample collection and sample packaging activities and personal hygiene practices including thorough hand washing as well as the designation of a clean area for eating and drinking.

4.5 Mitigated Constituents of Concern

The balance of chemical CoCs included for investigation in the PEA scope of work not previously addressed above are not expected to pose a significant exposure hazard to on-site workers given the following mitigating rationale:

- The suspicion of the presence of these CoCs, although possible based upon the historical uses of the MJCWC, is basically speculative in nature, the investigation of which serves as a screening purpose rather than as the result of strong material evidence;
- Despite potential persistency, a certain level of natural attenuation of a number of these CoCs may have occurred over the decades since the era of past uses;
- Initial subsurface investigations in 2007 did not reveal the presence of elevated concentrations of these CoCs in cases where they were included for analysis;
- There is no evidence that these CoCs would exist in highly volatile gaseous-state concentrations representing a vapor hazard to on-site workers and all drilling and sampling activities will be conducted in outdoor open spaces.

Consequently, the following listed CoCs are not expected to pose a significant exposure hazard to on-site workers. However, because exposure pathways to workers from these CoCs may involve dermal exposure, ingestion and contact with the eyes, these hazards will be controlled by proper use of PPE (gloves, safety glasses, footwear, clothing) and/or respirators if found to be warranted during drilling, sample collection and sample packaging activities as deemed necessary by the on-site Safety Task Leader and personal hygiene

practices including thorough hand washing as well as the designation of a clean area for eating and drinking. Sampling locations suggesting areas of potential concentrations of these CoCs are indicated respectively.

- Metals – In all AOCs
- Organochlorine pesticides – In areas of the reported landfill, sewage treatment facilities, incinerator, and in association with sewer and storm drain pipelines
- Asbestos – In areas of the reported landfill, sewage treatment facilities, incinerator, in association with sewer and storm drain pipelines, and soils around current and WWII-vintage buildings
- Dioxins and furans – In areas of the reported landfill, sewage treatment facilities, and incinerator
- Formalin
- X-ray wastes
- Perchlorate explosive constituents – In former firing range area.

4.6 Potential Biological Hazards

The Ag Beef project area proposed for redevelopment in the northwest portion of the MJCWC is located over the footprint of the reported former sewage treatment sludge drying pond area. Consequently, the PEA scope of work includes soil sample collection and analysis for evidence of pathogens, including nitrate, total nitrogen and total coloform. Despite the potential effects of natural attenuation of CoCs over the course of decades since the sludge drying ponds were historically utilized, samples retrieved may contain organic materials that contain biohazard/infectious materials. Gloves shall be worn when handling these materials. Additionally, any open wound or punctures should be covered to prevent infection. All areas should be disinfected as needed to prevent the spread of potentially hazardous materials and to prevent the contamination of samples. In the event that an on-site worker receives a cut, puncture or abrasion, appropriate first aid should be administered to prevent infection.

5.0 PERSONAL PROTECTIVE CLOTHING/EQUIPMENT REQUIREMENTS

This section specifies personal protective clothing/equipment required for the various tasks to be performed during this investigation. Table 3 summarizes these requirements.

TABLE 3
PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS
DRILLING OPERATIONS

Drilling Crew

MANDATORY ITEMS	AVAILABLE ITEMS
Tyvek® Coveralls*	Respirator
Chemically Resistant Gloves*	Splash Goggles
Neoprene Safety Boots**	Earplugs
Safety Helmet	
Safety Glasses	

TABLE 3 (cont.)
PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS
DRILLING OPERATIONS

Geologist/Engineers

MANDATORY ITEMS	AVAILABLE ITEMS
Neoprene Safety boots**	Respirator
Safety Glasses	Tyvek® Coveralls
Safety Helmet	Chemically Resistant Gloves
	Splash Goggles
	Earplugs

Surveyors/Safety Personnel

MANDATORY ITEMS	AVAILABLE ITEMS
Neoprene Safety Boots**	Respirator
Safety Glasses	Tyvek® Coveralls
Safety Helmet	Chemically Resistant Gloves
	Splash Goggles
	Earplugs

WELL PUMPING/LIQUID SAMPLE COLLECTION

Sampling Team

MANDATORY ITEMS	AVAILABLE ITEMS
Chemically Resistant Gloves	Respirator
Neoprene Safety Boots	Tyvek® Coveralls
Safety Glasses	Splash Goggles

PACKAGING AND SHIPPING SAMPLES

Sample Controller

MANDATORY ITEMS	AVAILABLE ITEMS
Safety Glasses	Respirator
	Chemically Resistant Gloves

SAMPLE PREPARATION AND ANALYSIS

Analyst

MANDATORY ITEMS	AVAILABLE ITEMS
Safety Glasses	Respirator
	Chemically Resistant Gloves

* Not required if soil or water is not visibly contaminated, or if PID measurements of the soil samples are below 14 ppm TVH.

** Steel-toe boots will be worn if neoprene safety boots are not required.

5.1 Drilling Operations

- *Respiratory Protection:* All field personnel will be required to have available for use, a properly fit-tested half-mask air purifying respirator with organic vapor cartridges and particulate pre-filters. These will be required to be worn based on the criteria listed in Section 4.0.

- *Protective Clothing:* All field personnel handling contaminated soils, liquid, or auger flights will wear semi-permeable (white) Tyvek® coveralls (or equivalent). Company issued safety helmets will be worn by all personnel during field work.
- *Hand Protection:* Butyl rubber or nitrile gloves will be worn by all personnel handling auger flights and contaminated soils. Wearing disposable latex or PVC gloves under the butyl gloves will provide added protection and aid in a more effective decontamination process.
- *Ear Protection:* Based on anticipated on-site noise measurements, field personnel may be required by the safety task Leader or Safety Officer to wear hearing protection devices (earplugs) during drilling operations.
- *Eye Protection:* Each field team member will wear a minimum of impact-resistant safety glasses with attached side shield. Where splashes of potentially hazardous liquid or flying particles are likely, chemical safety goggles will be required in place of safety glasses.
- *Foot Protection:* Field personnel will wear neoprene rubber boots with steel toes and shanks. Under non-liquid exposure conditions, leather boots with steel toes and shanks are permissible. The boots will be taped to the leg of Tyvek® suits.

At the discretion of the on-site Safety Task Leader, rubber gloves, Tyvek® coveralls and neoprene boots may not be required if soil or water is not obviously contaminated, or if PID measurements of the split-spoon soil samples are below 14 ppm TVH.

5.2 Sample Collection

Personnel who may be exposed to contaminated samples and/or liquid splashes will be required to wear the following equipment:

- *Respiratory Protection:* All sampling personnel will be required to have available for use a properly fit tested half-mask air purifying respirator with organic vapor cartridges with particulate pre-filters. Respirators will be worn based on criteria listed in Section 4.0.
- *Body Protection:* All sampling personnel will wear semi-permeable (white) Tyvek® coveralls when contact with contaminated soil or liquids is likely to occur. Company issued safety helmets will be worn when overhead hazards exist.
- *Hand Protection:* Butyl rubber or nitrile gloves will be worn over disposable latex or PVC gloves.
- *Eye Protection:* Impact-resistant safety glasses with attached side shield must be worn during sampling activities. Where splashes may occur, chemical goggles must be worn.
- *Foot Protection:* Neoprene rubber boots with steel toes and shanks will be worn.

5.3 Packaging and Shipment of Samples

- *Eye Protection:* Impact resistant safety glasses with attached side shield will be worn while packaging samples for shipment.
- *Hand Protection:* Butyl rubber or nitrile gloves will be worn under disposable PVC gloves.

All samples will be shipped strictly to a state-approved laboratory. Shipping must comply with Department of Transportation (DOT) regulations. The following instructions will be followed to comply with DOT regulations:

- Tape all lids with electrical or other tape,
- Wrap the primary container with absorbent brown paper (wading),

- Place the primary container in a plastic bag (zip-lock, or equivalent),
- Place into an "ice chest" with ice,
- Tape or secure the "ice chest" lid and secure with a Chain-of-Custody seal (if applicable),
- Label drums identifying the generator's name, address and known content of the drum.

In the event that samples are to be personally transported to the state-approved laboratory, some of the above packaging and shipping requirements may not apply. Any questions should be referred to the Project Manager.

5.4 Sample Preparation and Analysis of Samples

All laboratory safety practices should be accomplished in accordance with the specific labs policy. Krazan & Associates, its owners, clients, employees, and representatives, are not responsible for safety on laboratory premises. Therefore, both shall be held harmless in the event of any mishap, accident or long-term adverse health effects occurring or originating at the subcontractor laboratory.

6.0 WORK ZONE ACCESS

During drilling operations, a work zone shall be established and roped off. This zone should include all drilling equipment and its immediate vicinity. Only authorized personnel will be permitted to enter this work zone. Authorized personnel will include those who have duties requiring their presence in the work zone, have received appropriate health and safety training, and whose background medical records may be obtained to verify that the health of that individual is not at extreme risk by his/her presence.

7.0 DECONTAMINATION PROCEDURES

The Workplan specifies initial drilling and sampling activities at areas where petroleum hydrocarbon contaminated soils, sludges, liquids and/or vapors are anticipated. Due to the volatile nature of the petroleum hydrocarbons that may be encountered during the initial drilling and sampling operations, decontamination of equipment and vehicles will be of minimal importance since the volatile hydrocarbons will rapidly vaporize. However, contaminated sampling equipment and any obvious contaminant accumulations will not leave the project site. Field team members will also abide by the following guidelines to ensure that contaminants will not remain in contact with their body.

- All personnel involved in the field portion of this investigation will be instructed to wash their hands, face, neck, and arms at the end of the work day. Krazan will assure the presence of soap, water and towels at the drilling site for this purpose. All crews will be instructed to shower at their home or lodge at the end of the workday.
- No eating, drinking, smoking, or chewing of gum or tobacco will be permitted in the work zone.

During this investigation, the nature of materials handled and the extent of contamination may require formal decontamination procedures and delineated work/clean zones. At the discretion of the Task Leader, the following work zones and decontamination procedures will be used to minimize the transfer of hazardous substances from the site so as to protect the environment and public health.

7.1 Work Zones

The field team shall prevent the uncontrolled movement of waste materials or hazardous substances from the drilling site. The team will prevent migration of site contaminants by using the following work zones and equipment/personnel decontamination procedures.

Exclusion Zone: A circle around any given bore hole will be defined before drilling starts. In most cases, the zone will be "roped off" with an applicable barricade tape. This designated area will constitute the "Exclusion Zone." This zone is where potentially hazardous surface contaminants as a result of our investigation and physical hazards to the workers will be contained. Personal protection equipment will be required in this area according to the discretion of the Task Leader and/or in accordance with the guidelines contained in this plan. The size of the Exclusion Zone may be changed to accommodate site conditions and to ensure contaminant containment at the discretion of the Project Manager, Safety Officer, or Task Leader. No personnel will be permitted into the Contamination Reduction Zone or the Exclusion Zone unless they are in full compliance with the existing Safety Plan. The "buddy system" (within eye contact of other workers) must be maintained by all personnel while in this zone. Intrinsically safe communications will be maintained with all personnel in this area.

Contamination Reduction Zone: An area surrounding the Exclusion Zone will be defined. All personal decontamination activities will occur in this area. A waste container may be placed in this area so that contaminated disposal equipment can be placed inside and covered. Surface/soil contamination in this area may be controlled by use of some form of plastic sheeting.

Support Zone: A Support Zone must be defined for each field activity. Support personal and/or equipment is located in this uncontaminated (clean) area. Normal Krazan field uniforms are appropriate within this zone. The location of this zone depends on factors such as accessibility, wind direction, nearby roads, utilities, traffic patterns, shelter, etc.

7.2 Decontamination Protocol

Decontamination of personnel and equipment will be important to ensure that contamination does not spread to others. Personal decontamination mainly involves the removal of some outerwear and good personal hygiene

habits. Contamination should never be in contact with the skin. All field team members must follow this plan to ensure that contamination does not remain on equipment, sample containers, or their body.

All field team members should remove their personal protective clothing in a certain sequence to avoid contaminating their inner clothing or themselves. When removing personal protective equipment, the following steps should be observed:

Step 1: Remove all equipment, sample containers, and non-essential items while in the Contamination Reduction Zone. Obtain decontamination solutions or a steam cleaner and decontaminate all tools and sampling equipment. Under most circumstances, all wastes and rinsates will be properly contained.

Step 2: Remove outer gloves and boot covers and place them inside a garbage bag or drum.

Step 3: Remove tape from boots and gloves and remove the Tyvek® coverall (if used). Tyvek® coverall removal should be accomplished by rolling the outside of the coverall inside itself so that only the inside of it is exposed. Boots, inner gloves, and respirator should still be worn.

Step 4: Remove the inner gloves and respirator when in the Support Zone.

7.3 Personal Hygiene Requirements

The following procedures should always be observed in the support zone:

- All personnel must wash their hands, face, neck, and forearms before consuming any food or liquids, smoking, or using the restroom.
- All personnel must take a shower at the end of each work day. Particular attention should be given to areas of the body that are typically overlooked.

8.0 MONITORING PROGRAM

Personal exposure to ambient levels of airborne hazards and noise will be monitored and/or observed to ensure that personnel exposures do not exceed acceptable limits and for the selection of protective equipment. Personal monitoring will be randomly conducted using personal air pumps and appropriate sampling tubes. Previous data from similar jobs may be used to determine PPE levels. On all jobs, airborne contamination and downhole hydrocarbon vapor concentrations will be measured primarily by the use of a direct-reading instrument such as a PID. If concentrations approach established levels, Dräger® detector tubes will be used to determine the presence and concentration of benzene. In the case of on-site areas representing the potential for elevated concentrations of methane, the work area where sampling is conducted will be monitored with an approved combustible gas meter. Site visits/inspections may be conducted by the Krazan Safety Officer to ensure compliance with this plan.

8.1 Photoionization Detector

During this investigation, the ambient air, drilling returns, soil samples, and boreholes will be screened with a calibrated Mini Rae® brand, portable PID. The PID is a direct-reading real-time analyzer that is capable of detecting most of the volatile hydrocarbons constituents present in a vapor phase. The PID to be used for this investigation uses a 10.2 electron volt lamp and is calibrated using an iso-butylene calibration gas. Iso-butylene is a relatively safe calibration gas similar in ionization potential to benzene (the carcinogen of primary concern present in petroleum products).

8.2 Combustible Gas Meter

As part of the scope of work for investigation of the reported on-site landfill, as a safety measure to monitor the potential hazard of exposure to elevated concentrations of methane gas to on-site workers, the work area where sampling is conducted will be monitored with an approved combustible gas meter (RKI Instruments Eagle Portable Multi-Gas Detector) to detect the presence of potentially harmful flammable atmospheres. In the event that hazardous methane gas levels are detected, appropriate PPE including respirators will be required of on-site workers.

8.3 Dräger® Detector Tubes

Dräger® detector tubes will be used to determine airborne concentrations of benzene in the breathing zone during this investigation. A member of the field team will take detector tube readings if high PID measurements so warrant. Readings will be taken in the area where the field team members are working. Dräger® #6728561 benzene detector tubes will be used (measurement range 0.5-10 ppmv). The detector tube pump will be inspected for proper operation prior to field operations.

9.0 SAFETY AND HEALTH TRAINING

All field personnel will be trained in methods of safely conducting field activities. General training requirements that apply to field personnel include initial 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training and annual 8-hour HAZWOPER refresher training current within one year in accordance with the Cal-OSHA standard for HAZWOPER (Title 8 CCR, GISO 5192). This plan is intended to provide additional site-specific information to accomplish this goal. It will be the responsibility of the Project Directors, Safety Officer, and Safety Task Leader to ensure the field team has access to, reads, and understands this plan. It will be the individual's responsibility to bring to the attention of the Project Director or Safety Officer any portion of this plan and related training they do not fully understand. Prior to the commencement of the field portion of this investigation, the field team will meet to discuss the contents of this plan and make sure all members understand it.

At the site meeting, all field team members will be instructed regarding the health and safety hazards. Especially:

- Physical safety hazards;
- Emergency procedures;
- Explosive/flammability hazards;
- The hazardous materials that may be encountered and their potential routes of exposure;
- Personal hygiene practices;
- The types, proper use, inspection, limitations, maintenance, and storage of protective clothing and equipment (as applicable); and
- In the event that the ambient air temperature exceeds 85°F, a review of heat stress symptom recognition/corrective procedures will be conducted. For an unacclimatized person, this value may be less.

Special emphasis will be placed upon the use and limitations of respiratory protection. Half-mask respirators (or equivalent) equipped with air purifying organic vapor cartridges will be used. Full-face respirators will be used if eye irritation or skin contact exposure potential exists.

Medical/physical fitness requirements to wear respiratory protection will be established by a physician, and individuals will be trained in use limitations and maintenance of half-mask and full-face respirators including qualitative fit testing, routine inspection, replacement of parts, cleaning, disinfection, and storage requirements.

Copies of this entire plan will be provided for each field team member at the project site or prior to arrival.

10.0 MEDICAL MONITORING PROGRAM

The field investigation at this project site is expected to involve active physical work and potential exposure to petroleum hydrocarbons, and possibly other related hazardous substances. Exposure to heat stress, noise and physical safety hazards may also be encountered. The work will require people of good health with normal vision and hearing. Pursuant to the *2008 Krazan Safety Manual,* Medical Surveillance Program, regular and periodic medical surveillance may be provided for employees who are potentially exposed to hazardous chemicals and who wear negative pressure respirators. Employees who wear a respirator as a routine part of their job must be medically evaluated prior to respirator fit testing and on an annual basis thereafter to ensure that the employee is sufficiently healthy so that continued use of the respirator will not affect the worker's health. Pre-placement medical examinations must be made available prior to assignment of the employee to an area where employees may be exposed to a hazardous chemical and/or where negative pressure respirators are worn. If an employee will be exposed to benzene at or above the action level for more than 30 days per year, medical examinations in accordance with Cal-OSHA GISO 5218 will be provided. All employees with the potential to be exposed to "hazardous chemicals" will be provided with the appropriate medical exams in accordance with OSHA requirements. Medical exams shall be made available at least annually, however the

industrial physician has the option of scheduling exams more frequently if found to be necessary. Exams are required within 10 days following the 30th day of exposure at or above an action level. Krazan's industrial physician is periodically asked to provide documentation of employee medical fitness to perform the required work in the form of a signed document. This documentation should also indicate the employee's ability to perform the required work while wearing a respirator.

11.0 EMERGENCY RESPONSE PLAN

The emergency procedures described in this plan are designed to give the field team guidance in the handling of medical emergencies, fires, explosions, and excessive emissions. These emergency procedures will be carefully explained to the field team during the on-site health and safety meeting.

11.1 Injuries

Medical problems must be quickly dealt with; a road map to the nearest emergency medical facility is kept in an envelope on the dash of each Krazan field vehicle and drill rig. A map with a route to the hospital is included in this plan. The local emergency numbers are:

Police:	911
Fire:	911
Paramedics:	911
Hospital: Memorial Medical Center-Modesto	(209) 546-4500
Modesto Hazardous Materials Team	911
Stanislaus County Department of Environmental Resources	(209) 525-6700

The field team is to seek immediate professional medical attention for all serious injuries. A first-aid kit will be present at the drilling site for use in case of minor injuries. If any field team member receives a splash or particle in the eye, the eye is to be flushed for 15 minutes. Clean water or a portable eyewash will be available for this purpose. Instruction will also be provided to wash any skin areas with soap and water if direct contact with contaminants has occurred.

During normal field activities, work clothes may become wet. If a field team member's clothing becomes saturated with an obviously contaminated liquid/sludge, the possibility for dermal exposure to contaminants may exist. Under these circumstances, that field team member will change out of the contaminated clothing, clean off any residual liquid/sludge with water, and change into clean clothing of the proper level of protection.

11.2 Fire and Explosion Hazards

Fires are of particular concern during this investigation due to the possibility of encountering flammable petroleum hydrocarbon liquid or vapors. An adequate multi-purpose (A, B, C) fire extinguisher will be located onsite on the drill rig at all times.

The local fire department will be notified by a Krazan representative of the location and anticipated activities to provide a more timely response in the event of an emergency. In the remote chance that a fire does occur, the local fire department will be notified immediately. Additional calls to the main office of Krazan & Associates will be made. The Project Director would then notify the client.

11.3 Operations Shutdown

Under certain extremely hazardous situations the Task Leader, the Project Director, or the Task Safety Officer may request that field operations be temporarily suspended while the underlying hazard is corrected or controlled.

During any sampling or drilling activity, breathing zone PID measurements for hydrocarbons will be performed. If these levels exceed 50 ppmv, detector tubes will be used to further quantify the benzene vapors present. If the level of benzene is detected above 0.5 ppmv or PID readings are consistently in excess of 50 ppmv, respirators will be required and monitoring will be conducted every 30 minutes. If PID measurements above 1,400 ppmv occur in general areas or at the well head, a potential fire or explosion hazard may exist. Under these circumstances, activities will be stopped until these levels are brought down. This may be accomplished by containerizing contaminated soils or liquids of covering contaminated soil, foam, visquene, or clean soil to isolate the source.

11.4 Community Protection

To assure the community is not affected by our investigation, upwind and downwind monitoring with the PID will be performed if the general work area hydrocarbon levels exceed 100 ppmv. If site downwind monitoring indicates persistent levels above 50 ppmv at the perimeter of the work area, work will be shut down until PID readings drop below 50 ppmv. Alternately, the exclusion zone may be expanded to provide additional community protection.

12.0 RECORD-KEEPING REQUIREMENTS

The following record keeping requirements will be maintained in the health and safety or program file indefinitely:

- Copy of this Health & Safety Plan;
- Health and Safety training certification forms;
- Written respiratory protection program;
- Respirator training certification; and
- Any accident/illness report forms Documentation of employee's medical ability to perform work and wear respirators.

KRAZAN & ASSOCIATES, INC.
HEALTH & SAFETY PLAN
FIELD PERSONNEL RELEASE FORM

I, _____, do hereby confirm that I have read and understand the Health & Safety Plan for Project Number 014-06256, located at 2201 Blue Gum Avenue in Modesto, California. I agree to follow this plan and to make every effort to make the workplace safe. I will report any health or safety hazard that I observe to the Safety Task Leader, Project Safety Officer, or the Project Director.

I do agree to defend, indemnify, and hold harmless Krazan & Associates, Inc., its owners, employees, representatives, clients, and the property owner for any accidents, sickness, or injuries resulting from the violation, alleged violation, or non-compliance of this Health & Safety Plan.

*Name:*_____ *Title:*_____

*Signature:*_____ *Date:* _____

Krazan & ASSOCIATES, INC.
SITE DEVELOPMENT ENGINEERS

KRAZAN & ASSOCIATES, INC.
HEALTH & SAFETY PLAN
SUMMARY

The purpose of this summary is for quick field reference for the commonly referred to items covered in the Health & Safety Plan. It is not the intent of this summary to replace or supersede the information referred to in the Health & Safety Plan.

ANTICIPATED CLOTHING/EQUIPMENT

Hard Hat — Safety Glasses

Earplugs — Steel Toe/Shank Boots (Work__/Rubber__)

Gloves (work__/nitrile__/other__)

Krazan & Assoc. Uniform__/White Tyvek® Coveralls__/Yellow Tyvek® Coveralls__

No Respirator__/Half-Face Air Purifying__/Full-Face Air Purifying__/Supplied Air__

EMERGENCY CONTACTS

Krazan (Bakersfield Office)	(661) 837-9200	Hospital: Memorial Medical Center	(209) 546-4500
Fire	911	County Env. Health	(209) 525-6700
Police	911	HazMat Team	911
Paramedics	911		

NOTE: For additional information regarding this project site, please refer to the Health & Safety or Workplans for this investigation.