

ESSO Tutu Car Care Center
Investigation Plan
Health and Safety Plan

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BELGODERE AND ASSOCIATES

ENVIRONMENTAL—GEO CONSULTANTS

1.0 INTRODUCTION

During field activities all personnel involved will follow as a minimum the U.S. Environmental Protection Agency Standard Operating Safety Procedures. All Belgodere & Associates (B & A) employees and subcontractors to B & A will follow this plan.

Major site operations include the installation of KV-14 probes on the soil to extract vapors, to determine the presence, if any, of benzene, toluene, ethyl-benzene and xylene.

The prime responsibility for employee safety will rest with: (1) B & A for its employees, (2) B & A subcontractors for their employees, and (3) any other parties whose employees will work at the site, such as EPA and DPNR's.

B/A, its subcontractors, and other parties participating in on site work, will comply with all applicable requirements of the occupational safety and health administration.

2.0 FIELD ACTIVITIES

The field investigation at the ESSO Tutu Car Care Center include the following activities:

- * Soil vapor probe installation
- * Soil vapor extraction
- * Field Gas Chromatograph work
- * Soil drilling/coring

2.1 Key Personnel

The field personnel who will be responsible for the safe operation of this project are:

- * Project Officer: Belgodere, Carlos (B & A)
- * Drilling Supervisor: Morales, Alvaro (B & A)
- * Drilling Contractor: Polymetrics Inc.

2.2 Project Officer Responsibilities

The responsibilities of the Project Officer with respect to safety are as follows:

- * Locate support facilities in an uncontaminated area.
- * Test the emergency phone numbers to ensure their accuracy.

St. Thomas, U.S.V.I. Civil Defense -- 774-2244

St. Thomas, U.S.V.I. Hospital -- 776-8311

St. Thomas, U.S.V.I. Police -- 915

St. Thomas, U.S.V.I. Fire -- 921

St. Thomas, U.S.V.I. Ambulance -- 922

- * Implement the site safety training program as described in this plan.
- * Observe site activities to ensure the proper use of personal protective equipment.
- * Initiate outside emergency phone calls when an injury or accident requires medical attention.
- * Ensure that work schedules, dependent on work levels and outside temperatures, are set each day and adhered to throughout the work day.

- * Ensure that the field team observes the work zone and decontamination procedures.
- * Ensure that safety equipment is maintained in a safe manner.

2.3 Drilling Supervisor Responsibilities

The responsibilities of the Drilling Supervisor with respect to safety are as follows:

- * Drilling crew compliance with the health and safety plan.
- * Enforcement of corrective action under the direction of the B & A Project Director. Compliance problems will be brought to the attention of the Drilling Supervisor who will be expected to correct the safety problem through a series of reprimands, eventually resulting in the dismissal of the offending employee.

2.4 Corporate Safety Responsibilities

The responsibilities of B/A Corporate Safety Staff, are as follows:

- * Prepare a health and safety plan for the project;
- * Perform a job safety analysis;
- * Select appropriate personal protection equipment;
- * Define appropriate workplace exposure monitoring procedures;
- * Develop a contamination control program; and
- * Develop a plan to cope with anticipated emergencies.

2.5 Field Team Responsibilities

The responsibilities of the field team members are:

- * To read and understand this plan;
- * Perform your work safely;

- * Report any unsafe condition to your supervisor; and
- * Be aware and alert for signs and symptoms of exposure to site contaminants.

3.0 JOB SAFETY ANALYSIS

The tasks that will be conducted during this project may involve some exposure risk to the field personnel. An analysis of the hazard associated with each job is presented.

3.1 KV Soil Gas Extraction Probe Installation

The installation of soil gas extraction probe may expose the field team to the hazards listed below.

- * Exposure to possible chemical contamination present in soils. Presently, the suspected chemical contamination is:
 - Benzene, toluene, ethyl-benzene and xylene.
- * Exposure to physical hazards associated with drilling activities.
- * Exposure to the hazards of heat stress.

Personnel protection to be used during the installation of soil gas extraction probe are listed below.

- * Tyvek coveralls;
- * Viton gloves;
- * Steel toed, safety boots;
- * Respirator, half face or full face piece equipped with organic vapor cartridges and dust filters;
- * Safety goggles;
- * Safety helmet

Depending on site conditions and soil conditions, other items may be used for supplemental protection. Such items may include:

- * Chemical splash goggles;
- * PVC disposable gloves;
- * PVC bib overalls and jacket

3.2 Soil Sampling

Soil samples will be obtained during this investigation. This activity will expose the workers to the hazards listed below:

- * Exposure to possible chemical contamination present in soils. Presently, the suspected chemical contamination is:

-- benzene, toluene, ethyl-benzene and xylene.

- * Exposure to physical hazards associated with drilling activities.
- * Exposure to the hazards of heat stress.

Personnel protection to be used during drilling operations are listed below:

- * Tyvek coveralls;
- * Viton gloves;
- * Steel toed safety shoes;

- * Respirator, half face or full face equipped with organic vapor cartridges and dust filters;
- * Safety helmets;
- * Safety goggles;
- * Hearing protection.

Depending on site condition and drilling condition, other items may be used for supplemental protection. Such items include:

- * PVC bib overalls and jackets
- * PVC disposable gloves
- * Chemical splash goggles

4.0 TRAINING INFORMATION ON HEALTH AND SAFETY PROCEDURES

- * Always wear the proper personal protection as required by the health and safety plan.
- * Always wear eye protection while working on site. Driving pins in drive chains, handling chemicals,

breaking concrete, hammering or sledging, cutting wires, grinding, and/or welding are all examples of work that is hazardous to your eyes.

- * Don't set or drop a heavy object on your foot.
- * Use the correct stance when lifting a heavy object.
- * Watch out for slippery surfaces or objects to trip on.
- * Always wear splash goggles when handling chemicals.
- * Keep your clothing out of spinning rig equipment.
- * Always get treatment for even the most minor scratch or abrasion.
- * Watch out for swinging equipment. Most drilling equipment will break a rib if it hits you.

4.1 Health and Safety Training

Prior to starting the work, the Project Officer will conduct a training session and ensure that each field team member understands his or her safety responsibilities.

All personnel assigned to drilling activities efforts will be instructed regarding the potential health and safety hazards. Specifically, the following topics will be covered in the initial training session.

- * Potential routes of contact with toxic and/or corrosive materials, excessive noise, or physical site hazards.

- Skin contact/absorption

- Eye contact

- Inhalation

- Ingestion

- Hearing exposure

- * Types, proper use, limitations and maintenance of applicable protective clothing equipment.

- Safety helmet

- Eye protection

- Gloves

-- Safety boots

-- Tyvek coveralls

-- Respirators

- * Respiratory protection using full-face or half-face piece air purifying respirator equipped with organic vapor cartridges and dust filters.

-- Forms of respirators: air purifying, air supplied, and self-contained

-- Selection of respiratory protection based on the hazard

-- NIOSH certification of all equipment to be used on site

-- Medical/physical fitness to wear respiratory protection

-- Use, limitations and maintenance of full and half-face respirators including qualitative fit testing, routine inspection, replacement of parts,

cleaning, disinfection, decontamination, and storage requirements.

- * Proper decontamination procedures and adherence to work zone boundaries.
- * Reporting of accidents and availability of medical assistance.

4.2 Potential Routes of Exposure

The field team may be exposed to site hazards in various ways. The worker may be exposed to chemicals by coming in contact (skin, eyes), by breathing vapors, fumes, mists, or dusts, or by ingesting the harmful chemical. The following subsections describe how the worker will avoid these exposures.

4.3 Personal Protective Clothing and Equipment

Workers on site will use protective clothing and equipment to reduce or eliminate the risk of exposure to the hazards mentioned above. Workers will be trained in the proper use of such clothing and equipment before starting work.

Clothing

Protective coveralls will reduce the chances of contacting contaminated material. The Tyvek coverall will provide protection against splashes, and dusts. The coveralls are not to be considered "impervious" and should be quickly removed upon obvious contamination.

Gloves

The recommended glove material for use during this project is Viton. These gloves should be used in combination with disposable PVC under gloves.

Eye Protection

Several levels of eye protection are available for this project. The full-facepiece respirator will provide eye protection against splashes and eye irritating gases and mists. Splash goggles will be used when steam cleaning equipment. Every team member will use proper safety glasses with attached side shields while on site.

Respiratory Protection

The type of respirator selected for this project is a MSA half or full face air purifying respirator. The cartridges to be used in these masks are organic vapor cartridges fitted with dust filters.

The respirators selected for this project will provide protection against potential levels of airborne gases, fumes, mists, and dusts. To ensure that the mask will perform as expected, the respirator must be inspected, fit tested, maintained, and stored properly, according to company policy and governmental regulations.

1. Inspection Procedures:

The face-piece (full or half) should be free of dust, dirt, rips, tears, and obvious contamination. The septa (three in the half-facepiece, one in the full-facepiece) should be present and in good shape, watch for rips or dirt.

2. Fit Testing Procedures:

The first step in testing the fit of your respirator is called the negative pressure test. Block the

inhalation valves (on the side of the mask) with the hands or plastic sheets and inhale slightly. You should feel the mask draw in on the face. Watch for air leakage around the face-piece indicating a poor facial fit. REMEMBER, NO FACIAL HAIR THAT INTERFERES WITH THE FIT OF THE MASK IS PERMITTED.

The next test (positive pressure test) is done by blocking the exhalation valve (at the bottom of the mask) with the palm of your hand. Exhale gently and notice for air leaking around the face-piece of the mask, indicating a poor fit. If air is leaking out of the mask, re-tighten the straps and perform the negative and positive pressure tests again.

The last test (qualitative testing) involves the use of an indicating odor that is passed around the mask fitted with ORGANIC VAPOR CARTRIDGES. The employee will be asked to position his or her head to the side, up and down to simulate normal working conditions. The detection of the odor indicates that the facial seal of the mask is inadequate. If the employee detects the smell, the trainer is allowed to tighten the straps and adjust the mask on the employee one time. If the odor test is unsuccessful twice, another brand of mask should be fitted.

3. Maintenance of Respirators:

Respirators will be maintained to ensure that they work properly. Replace any missing part of the mask or strap, clean the mask with hot soapy water after each use, and do not let others wear your mask without disinfection first.

4. Storage of Respirators:

Respirators must be stored in a clean, safe, dry, environment (e.g. not near the working area or on the drilling rigs).

5. Use and limitations of Respirators:

Respirators selected for this project should be used properly and within the limits for which they were designed. These air purifying respirators will be useful in concentrations well below the 100 ppm filtration limit of the cartridges. These masks do not provide oxygen and should not be used in confined spaces or oxygen deficient atmospheres.

4.4 Decontamination and Work Zone Procedures

Items that become contaminated must be cleaned up to prevent employee exposure and the spread of harmful materials. The field team will also be expected to establish work zones and comply with safety procedures and dress codes for each particular zone.

Section 5.0 gives a description of the decontamination procedures that will be used for this project. The following information will be given to the field team:

- * Work zone definition and marking;
- * Dress codes for each work zone;
- * Decontamination procedures for personnel, equipment, and heavy equipment.

Exclusion Zone

The exclusion zone is the area immediately surrounding the work area where soil sampling is being conducted. For soil sampling the exclusion zone will comprise a circle extending 25 feet in diameter around the drilling rig.

Proper personal protection consists of hand, foot, eye, respiratory, body, and head protection as listed in Section 3.1.

Contamination Reduction Zone (CRZ)

The contamination reduction zone is the area where decontamination will occur. The idea is to have personnel remove contaminants, if any, from themselves and their equipment inside the CRZ. This practice will avoid the spread of contamination, if any, into the support area.

Support Zone

The support zone is intended as an area that remains free of contamination and is used for staging activities, breaks, and eating. It is extremely important to keep this area clean and free of contamination. Never bring contaminated equipment, articles or yourself into this area without going through the decontamination procedures first.

Decontamination Procedures

Personnel and equipment can become contaminated in a number of ways including:

- * Contacting vapors, gases, mists, or particulates in the air.
- * Being splashed by materials while sampling or opening containers.
- * Walking through puddles of liquids or on contaminated soil.
- * Using contaminated instruments or equipment.

Protective clothing and respirators help prevent the wearer from becoming contaminated or inhaling contaminants. Good work practices help reduce contamination of protective clothing, instruments, and equipment.

The employee needs to be aware of donning and doffing procedures for protective clothing and equipment. These procedures are easy to follow:

- * Gloves go on your hands first when putting protective clothing on; and
- * Gloves come off your hands last, when undressing.

These procedures will be supplemented by performing decontamination on personnel, equipment and heavy equipment. Decontamination procedures consist of physically removing contaminants from the person or equipment with:

- * Steam cleaning equipment;
- * Detergent washing.

The drilling rig and soil coring equipment will be detergent washed and steam cleaned to remove any contamination.

Respirators should be washed with detergent/disinfection solution to remove any contamination. Respirators must be washed at the end of each day or more often if they become grossly contaminated.

4.5 Emergency Procedures

Emergency procedures listed in this plan are designed to give the field team instruction in handling medical emergencies, fires and explosions, and excessive emissions during drilling/coring.

Medical Injuries

Medical problems that can occur on site need to be handled competently and quickly. Each field team member should be aware of the instructions and information given below:

- * Write down and post the telephone numbers of the local plant and community ambulance and medical facilities.
- * Seek professional medical attention for personnel that are not breathing, bleeding severely, experiencing intense pain or are unconscious. Each member of the site team should know how to call for an ambulance.
- * If you get anything in your eyes (chemicals or dust), flood them with water for 15 minutes. Be sure to tell a supervisor. The supervisor will make sure that the employee washes the eyes for the full 15 minutes.
- * Do not remove objects that are impaled (stuck) in the eye.
- * Always seek medical attention for eye injuries.

- * Stop bleeding with direct pressure. Place a bandage over the wound and press down with your hand. Use a tourniquet only in extreme cases when you are not able to stop severe bleeding.
- * If you contact any contaminated material, wash the affected area with soap and water as soon as possible. If large amounts of contaminated material come in contact with the body, you will be required to take a full body shower with soap immediately.

Fire and Explosion Response Procedures

Fires on site can be caused by the drilling rig activity. The drilling rig will have a fire extinguisher on hand at all times. The procedure for using a fire extinguisher is to pull the safety pin, point the extinguisher at the base of the flames and discharge the extinguisher by sweeping the flames from a distance of six feet. Move in closer as the flames are being put out.

- * Never use water on an electrical fire or a solvent fire. All extinguishers should be dry chemical and labeled "Class A, B, C".

- * Keep decontamination solvents well away from the steam cleaner.

Excessive Emissions Procedures

Ambient air samples will be taken prior to soil sampling and during drilling operations on an hourly basis if hydrocarbons are found. During drilling and coring activities, emissions may become excessive. When excessive emissions are detected, follow these procedures:

- * Cease drilling and contain cuttings.
- * If emissions are not controlled, remove auger flights and close the borehole.
- * Be prepared to evacuate to an upwind site.

5.0 DECONTAMINATION PROCEDURES

To minimize the transfer of any hazardous substances from the site, contamination control procedures are needed. Contaminants must be removed from people and equipment prior to relocation from a work zone.

5.1 Work Zones

The field team will prevent contaminated material from moving from the drilling site. The team will prevent migration of site contaminants, if any, by using work zones to control the spread of contamination. Decontamination procedures will also help reduce the chances of spreading contaminants, if any.

Exclusion zone

A 25 foot circle around the drilling site will be defined before drilling starts. The circle will constitute the "Exclusion Zone". This zone may contain potentially hazardous airborne and physical hazards to the workers.

Contamination Reduction Zone

A corridor leading from the exclusion zone will be defined. This corridor should lead from the drilling rig to the break area. All decontamination activities will occur in this area. A waste container should be placed at the end of the corridor so contaminated disposable equipment can be placed inside and covered.

Support Zone

A support zone must be defined for each field activity. The zone should be at least 50 feet from the drilling rig and should be clean and free of contamination (surface and airborne).

5.2 Personal Hygiene Requirements

Some general rules to obey when in the support zone are as follows:

- * You must wash your hands and forearms with soap and water before eating, drinking, smoking, anything.
- * You must wash your hands before using the toilet.

Remove personal protection equipment in the order given below while in the decontamination corridor.

- * First, remove any outer gloves or boot covers and drop them in the container provided.
- * Remove the tyvek coverall, save this coverall unless it is contaminated.

* Remove your respirator.

* Last, remove your inside gloves.

Reverse the order of the doffing procedure when you are ready to re-enter the exclusion zone.