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**WA State Department  
of Ecology (SWRO)**

**Ocean Spray Cranberries, Inc.  
Aberdeen, WA  
EPA ID#WAD982656464  
NPDES Permit #WA003271**



**Wastewater Treatment Plant  
Operations Manual**

**For**

**Ocean Spray Cranberries, Inc.  
Aberdeen, Washington**

**Revised June 15, 2023**

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## **Chapter 1: Introduction**

The Wastewater Treatment System at the Ocean Spray Cranberries, Inc. (OSC) plant in Aberdeen, Washington, provides reliable treatment of the wastewater generated by either sweetened dried cranberry processing, or cranberry juice processing and concentrating operations. The treatment plant also treats sanitary wastewater discharge from the septic tank servicing the production facility. The treated wastewater is discharged to the Grays Harbor Estuary adjacent to the property through a National Pollutant Discharge Elimination System (NPDES) permitted outfall.

The purpose of this manual is to provide the wastewater treatment plant (WWTP) operators and their supervisors with:

1. A complete and detailed description of the wastewater treatment processes and equipment.
2. A summary of the basic operation and control procedures required for successful treatment of the manufacturing process wastewater.
3. Procedures which may be used during extremely cold weather periods and during periods of extended production plant shutdown.

As operating experience is gathered, and with changing conditions, modification of some of the procedures discussed herein may become necessary. To maintain its value, this document will be reviewed annually and updated as required. Updating the manual will be the responsibility of the Plant's Environmental Health and Safety Manager.

## **Chapter 2: Facility Operators and Management Personnel**

Under conditions of the NPDES permit (Permit) issued by the Washington State Department of Ecology, "the Permittee must, at all times, properly operate and maintain all facilities or systems of treatment and control (and related appurtenances) which are installed to achieve compliance with the terms and conditions of this permit." In accordance with WAC 173-230-140, OSC's wastewater treatment facility in Aberdeen, Washington is a Class II WWTP and must be operated by an operator certified by the state of Washington for at least a Class II plant. This operator must be in responsible charge of the day-to-day operation of the WWTP. An operator certified for at least a Class I plant must be in charge during all regularly scheduled shifts.

It is imperative operations personnel notify the Washington State Department of Ecology and the Washington State Department of Health whenever one of the following events occurs:

- Any failure of the disinfection system.
- When there is an overflow in the wastewater collection system, influent sump, or at the treatment plant.
- When there is a bypass of the treatment plant.
- When it is anticipated there may be a short-term or long-term reduction in the treatment efficiency that might cause an effluent violation.

### **2.1. Management**

The management staff is ultimately responsible to see that federal and state regulations are met, and that the facility operates within budgetary constraints. Managerial responsibilities include the following:

- Maintain plant efficiency.
- Maintain adequate records.
- Establish staff requirements.
- Provide good working conditions.
- Conduct in-plant training sessions when necessary and encourage enrollment in relevant training. Provide special training on safety and emergency procedures.
- Maintain good public relations. Receive visitors courteously. Show the plant with enthusiasm and provide accurate information.
- Prepare budgets and reports as required by superiors.
- Develop standard operating procedures (SOPs).
- Be prepared to help operate the plant during emergency conditions.
- Establish a preventive maintenance program.

### **2.2. Operations**

Operations personnel are responsible for the day-to-day operation of the plant and monitoring of its performance. Responsibilities of the operations staff include the following:

- Keep working areas clean, orderly, and safe.
- Coordinate with the maintenance and laboratory personnel to assure that the plant performs properly.

- Know and use proper operational procedures. Operate the plant as this manual and appropriate SOPs direct.
- Maintain accurate operating records. Records show trends and causes and provide information that must be reported to authorities. Detailed daily logs provide essential information for evaluating process and system issues related to plant efficiency and reliability and the corrective action methods employed and whether those measures were successful or unsuccessful.
- Keep superiors informed of treatment issues in a timely manner.
- Utilize operating funds properly. Control costs while operating the plant in compliance with applicable federal and state law.
- Keep informed about current operation practices for similar treatment plants.
- While the treatment plant is not staffed 24-hours a day by a certified operator, they will be called on site to remedy treatment issues that crop up. In the event that none of the certified operators can travel to the plant, a plant supervisor with the help of a bargaining unit employee may be asked by the licensed operator to make minor adjustments to the system with guidance of the licensed operator over the phone. The list of minor adjustments includes but is not limited to turning ON/OFF various pumps, placing the treatment system into divert, turning aerators ON/OFF, etc.

### **2.3 Laboratory**

Except for certain parameters, the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. The laboratory at this facility is accredited for biochemical oxygen demand (BOD), ammonia, total suspended solids (TSS), total chlorine residual, and pH. A copy of the laboratory's Quality Assurance Manual is included in Appendix A.

### **2.4 Responsible Personnel**

Responsible personnel are identified in Appendix C.

## Chapter 3: Personnel Safety

All WWTP personnel are required to have instruction in authorized person hazardous energy control (lockout/tag out), confined space entry, hazard communication, evacuation, fire extinguisher use, personal protective equipment, and electrical safety. Annual refresher training for fire extinguisher use and hazardous energy control is also required. Personnel are required to adhere to all plant safety rules and state and federal safety regulations. A copy of the Plant's Emergency Action Plan is provided as Appendix E.

Any injuries or dangerous work conditions are to be reported immediately to facility management.

### 3.1 General Safety Precautions

Personnel working at the Wastewater Treatment Plant may be exposed to many hazards, including any of the following:

- Physical injuries
- Toxic or suffocating gases or vapors
- Toxic and harmful chemicals
- Fire
- Electrical shock
- Equipment hazards
- Excessive noise

The purpose of this chapter is to acquaint the operator with hazards, which may exist at the facility and with precautions which may prevent accidents or injury. This chapter also discusses the emergency systems and safety equipment available at the facility.

### 3.2.1 Physical Hazards

#### 3.3.1 Physical Injuries

The most common physical injuries are cuts, bruises, burns, crushing, and broken bones. Injuries can be caused by moving machinery or by falls from or into tanks, wet wells, catwalks, and platforms. Most injuries can be avoided by the proper use of ladders, hand tools, and safety equipment, and by following established safety procedures.

The following guidelines should be used to prevent physical injuries:

##### 3.3.1.1 Hard Hats

- Employees working in areas where there is possible danger of head injury from impact or from falling or flying objects, or from electrical shock and burns, shall be protected by protective helmets.
- Use a hard hat whenever working below ground level in open tanks and around overhead hazards including ladder work, streetlights, tree pruning, etc.
- Use a hard hat when working as a grounds man, flagger, or other assistant around operating equipment.

- Use a hard hat when operating riding equipment without a cab or roll-over protection (exclusive of lawn equipment).
- Use a hard hat when utilizing overhead hoists.
- Use of a hard hat may be required by a Supervisor whenever, in her/his opinion, a hazard for the specific activity exists.

#### 3.3.1.2 *Eye Protection*

- Eye protection should be used during the operation of any machine whereby particulate matter may be discharged in eyes.
- Eye protection should be used when handling, mixing or applying chemicals.
- Wear splash resistant chemical goggles and a face shield, or a full-face respirator when handling any acids, bleach or other chemicals, which may be damaging to the eyes. [Refer to appropriate Safety Data Sheet (SDS).]
- Laboratory work (see lab safety guidelines).
- Use a face shield when the potential exists for particulate matter to be discharged into the eyes. Safety glasses are to be worn for protection against possible projectile hazards while operating grinders, drill presses, blowers, etc.

#### 3.3.1.3 *Ear Protection*

- Ear protection should be used in all areas where decibel levels are above Occupational Safety and Health Act (OSHA) threshold requirements (see Plant Hearing Protection Policy), which are identified in the Plant's Hearing Protection Policy.(in excess of 10 minutes).

#### 3.3.1.4 *Life Vests*

- Life vests should be used for all lagoon work from a boat, and all tank, channel, and manhole work over water not protected by handrails or grating.
- Life vests should also be used when conditions warrant (example: working around the banks of the lagoon.)
- Work in pairs when utilizing life vests.

#### 3.3.1.5 *Lifelines and Harnesses*

- Utilize fall protection devices for work over tops of buildings or empty tanks not protected by handrails or gratings, and work during icy conditions over hazardous areas whereby existing handrails do not provide adequate protection.
- Follow the Confined Space Entry Policy for all entry into manholes, manways, tanks, etc.
- Always work in pairs when utilizing lifelines and harnesses, unless a third person is required to lift a person from a manhole or similar area.

#### 3.3.1.6 *Protective Gloves*

- See laboratory guidelines for use in laboratory.
- Glove material should be chosen based on the exposure. Cotton, fiberglass, leather, neoprene, nitrile, PVA, PVC, and rubber latex should be made available.
- Protective gloves should be used when handling chemicals, which may cause skin burns; typically, chlorine, caustics, acids, and solvents (Refer to appropriate MSDS).
- Protective gloves should be used when contact with bio-hazardous materials such as contaminated equipment is anticipated (see established Blood borne Pathogen policy).

#### 3.3.1.7 Hand Tools/Electrical Cords

- All personnel should understand and carry through with proper tool handling and tool care. Appropriate equipment training must be accomplished prior to equipment usage.
- All electrically powered hand tools used outdoors and/or within 6 feet of water shall be protected by a ground fault interrupter (G.F.I.).
- All extension cords shall be maintained in good condition with the ground prong intact.

#### 3.3.2 General

- Do not ride on the outside of any vehicle.
- Seat belts are mandatory while operating vehicles while conducting OSC business. Anytime rolling stock is being operated, seat belts should be worn.
- Store gas containers only in buildings/locations specified for such use.
- Never stand on the top step of a step ladder or the top two steps of an extension ladder.
- Always use two people when using any ladder 10 feet tall or over. Always use a wooden or fiberglass ladder when doing electrical work requiring use of a ladder.
- Running in the plant is prohibited.
- Smoking is prohibited on OSC property.

#### 3.3.3 Housekeeping

Many physical hazards can be prevented or lessened by routine facility maintenance and good housekeeping. Operators should observe the following procedures:

- Have a place for tools and equipment. When not being used, see that they are kept in their proper places.
- Clean up all spills of oil, grease, chemicals, and water. Keep walkways and work areas clean.
- Provide proper containers for wastes, oily rags, and papers. Empty these frequently.
- Clean lighting fixtures as required to allow good vision.
- Maintain stair handrails and non-slip treads.

### 3.4 Confined Space Entry

Observe OSC's Confined Space Policy when entering and working in any basin, manhole, tank, utility door, vault, or other confined space. Basins, covered tanks, or sumps are potential death traps. Confined spaces should never be entered alone. A safety harness should be used, and sufficient personnel should be available for retrieval. Where practical, use a winch with the safety harness for non-entry retrieval.

Always use supply and exhaust fans for ventilation, and check for explosive gases and oxygen deficiency before entering any confined space.

Be particularly alert for toxic or suffocating gases in vaults and in tanks. Always check the atmosphere for oxygen deficiency and for hazardous gases, particularly hydrogen sulfide and carbon dioxide, before entering these areas. Hydrogen sulfide may be present in the groundwater and has a rotten egg odor, but the sense of smell is impaired rapidly with exposure. The odor is not evident at high concentration. Hydrogen sulfide is colorless, flammable, explosive, and poisonous. Death from paralysis of the respiratory system occurs within minutes at a 0.2 percent concentration by volume.

Carbon dioxide is frequently present in groundwater in supersaturated concentrations. Under atmospheric conditions the carbon dioxide can be released from solution. Carbon dioxide is colorless, odorless, and nonflammable, but it is heavier than air and settles in low points displacing oxygen. Concentrations of 10 percent or more cannot be endured for very long.

### **3.5 Oxygen Deficiency**

Low oxygen levels may exist in any enclosed, unventilated structure where gases, such as hydrogen sulfide and carbon dioxide, may be present or produced. This is particularly true where the structure and/or wet wells are below grade.

Equipment is available at the facility to measure for oxygen deficiency and must be used whenever entering a potentially hazardous area. Ventilation must be provided as required by fans or blowers. Operate every fan continuously when working in these areas. Get air into any manhole or tank before entering to work and keep air coming until departure from the work area. Ventilation and monitoring must continue as long as anyone is present within those spaces. Observe OSC's Confined Space Policy.

### **3.6 Electrical Shock**

Electrical shock frequently causes serious injury or death. Repairs to electrical equipment should only be conducted by qualified personnel with knowledge of the equipment and who are authorized to work it. Observe OSC's Electrical Safety Policy.

### **3.7 Fire and Explosion**

Burns from chemical or electrical fires can be very serious. Avoid these by proper handling of chemicals and by maintaining electrical equipment and wiring.

Avoid collection of flammable material in the facility. Store flammable materials in approved containers at proper locations. Explosive gas mixtures may develop in confined areas from mixtures of air and methane, hydrogen sulfide, natural gas, manufactured fuel gas, or gasoline vapors. Avoid explosions by keeping open flames away from enclosed areas and by providing adequate ventilation with fans or blowers. Observe NO SMOKING signs.

Know the location and proper use of fire-fighting equipment. Prominently post the telephone number of the local fire department or call 911 in case of emergency.

- If there is a fire, vacate the building and call the fire department (911) for assistance. Close doors to slow the fire spread. Don't let a fire block an escape path.
- Extinguishers - An extinguisher is labeled according to whether the fire on which it is to be used occurs in wood or cloth, flammable liquids, or electrical. Using one type of extinguisher on another type of fire can make the fire much worse.
  - Ordinary Combustibles
    - Type A Fires in paper, cloth, wood, rubber, and many plastics require a water type extinguisher.
  - Flammable Liquids

- Type B Fires in oils, gasoline, some paints, lacquers, grease in a frying pan or in the oven, solvents and other flammable liquids require an extinguisher labeled B.
  - Electrical Equipment
    - Type C Fires in wiring, fuse boxes, energized electrical equipment, and other electrical sources require an extinguisher labeled C.
- Learn How to PASS
  - Pull - Pull the pin. Some units require the releasing of a lock latch, pressing a puncture lever, or other motion.
  - Aim - Aim the extinguisher nozzle (horn, or hose) at the base of the fire.
  - Squeeze - Squeeze or press the handle.
  - Sweep - Sweep from side to side at the base of the fire until it goes out. Shut off the extinguisher. Watch for re-flash and reactivate the extinguisher, if necessary.
- Foam and water extinguishers require slightly different action. Read the instructions.

### **3.8 Equipment Hazards**

#### 3.8.1 General

When working on or around mechanical equipment, operators should observe the following safety precautions:

- Operators should not touch electrical systems or controls unless they are electricians familiar with the specific equipment.
- Operators should be aware of moving equipment. Guards over couplings and rotating shafts should be in place at all times.
- Operators should not wear loose clothing and rings or other jewelry around machinery. Long hair must be secured. Gloves should be worn when cleaning machinery to protect hands from sharp objects and chemicals.
- When starting rotating equipment after a shutdown, stand away from rotating shafts.
- Use and observe Lock-Out/Tag-Out tags and locks during maintenance and repair of plant equipment and valves.

#### 3.8.2 Specific Equipment Hazards

For hazards associated with a piece of equipment, refer to manufacturer's technical manuals.

### **3.9 Chemical Hazards**

Before entering any building containing chemicals, know the location of all eyewash/emergency shower stations. Know the location of the safety locker and be familiar with the first aid kit.

If eye burns are experienced, irrigate the eye immediately before moving the patient for medical equipment. Irrigate for at least 15 minutes while holding the eyelids apart and rotating the eye. Seek immediate medical treatment.

If skin burns are experienced, apply copious amounts of water to the burned area. Remove the affected clothing. Do not neutralize with an alkaline solution. Seek immediate medical help.

### **3.10 Safety Equipment**

Safety equipment provided at the WWTP includes the following:

- Emergency eyewashes
- Emergency showers
- Emergency eyewash/showers
- Fire extinguishers
- Signage

Personnel should be familiar with locations and proper use of all safety equipment. Safety equipment should be maintained, serviced, and/or re-stocked as required. Fire extinguishers will be inspected monthly, annually and recharged or replaced after each use.

## **Chapter 4: Wastewater Treatment System Description**

### **4.1 Physical Layout**

A site plan of the treatment system for the manufacturing process wastewater is shown in Appendix B. The facility contains the following major components:

1. The raw waste lift station (influent sump) receives wastewater from the processing plant and certain storm drains in work areas outside the plant buildings. The wastewater is pumped over a grit removal system, then to the rotary screen for coarse solids removal at the influent structure.
2. The screened wastewater flows by gravity to a 1,000-gallon mix tank, where the nutrients necessary for biological treatment are added to the wastewater. The nutrient stock solutions are pumped from a 500-gallon urea tank and a 510-gallon phosphoric acid tank with metering pumps, located in the sludge press room. The wastewater then flows to the head of the .7-million-gallon aerated mixed liquor lagoon through a distribution pipe. An aboveground 5,000-gal tank (previously MagOx tank) is available to divert slugs of high strength wastewater coming from the plant.
3. At the end of the lagoon the mixed liquor is pumped to the clarifier. The clarifier is a 32-ft. square tank that includes a 12 x 28 ft. waste activated sludge (WAS) holding basin, and a 12 x 4 ft. return activated sludge (RAS) pumping chamber. A portion of these solids are sent to the sludge conditioning system.
4. Effluent from the clarifier then flows to an ultraviolet (UV) treatment unit where it is disinfected and then discharges to the Grays Harbor Estuary via subsurface piping.
5. A sludge conditioning system consisting of a polymer mix/feed system and a 2,500-gallon mixing tank is located in the wastewater sludge press room.
6. Sludge dewatering is accomplished by a dewatering belt press.
7. Wastewater controls, chemical storage, and spare parts are in the sludge press room area.
8. Wastewater monitoring equipment is in the final outfall shed. This equipment monitors ammonia, pH, and turbidity.

### **4.2 Overall Treatment Process Concept**

#### **4.2.1 General Discussion**

The overall treatment facility is designed to accomplish the following wastewater treatment objectives:

1. Collection of all wastewater
2. Wastewater pumping

3. Nutrient adjustment
4. Disinfection
5. BOD and suspended solids removal
6. Conditioning and dewatering of waste sludge
7. pH adjustment

A process flow schematic is shown in Appendix B, along with a Process and Instrumentation Diagram for the treatment system. Reference should be made to these drawings while reviewing the narrative material in the following paragraphs and subsequent sections of this manual.

#### 4.2.2 Wastewater Collection, Pumping, and Screening

Raw process waters flow by gravity to the existing influent wet well. It is then pumped to the influent structure for grit removal, and then to the rotary screen for coarse solids removal. Grit is collected in the rock trap and cleaned out at least annually by a contractor. Solids collected on the rotary screen are deposited in a waste bin, and screened wastewater flows by gravity to the 1,000-gallon mix tank, where nutrients are added. The wastewater then flows to the head of the aerated lagoon.

#### 4.2.3 Lagoon Level Control

The level of the lagoon is constantly monitored and fed to a set of electronic controls. These controls vary the flow rate of the clarifier feed pumps to maintain a fairly constant level in the lagoon by varying the opening of the feed valve to the clarifier. The flow rate is set for a maximum of 300 gallons per minute (gpm) and a minimum of 100 gpm. When the lagoon level reaches operational low level, the control system diverts the effluent flow back to the aerated lagoon. This allows the clarifier to stay full, prevents stagnation of heavy settling in the clarifier, and continues RAS flow.

#### 4.2.4 Nutrient Feed System

An automatic composite sampler is located adjacent to the 1,000-gallon mix tank. Composite samples of the influent entering the tank during the previous day are analyzed for chemical oxygen demand (COD) and pH. Grab samples of the effluent are also taken and tested for nitrogen and phosphate. Supplemental nitrogen and phosphorus are added to the mix tank to maintain a BOD: N:P ratio of approximately 100:5:1 in the Mixed Liquor lagoon.

Nutrient management is accomplished through the use of a nutrient addition system that includes a mixer, a 250-gallon urea mix tank, a 500-gallon urea storage tank, and a 510-gallon phosphoric acid tank, installed in the sludge press room. Nutrient dosage rates are set by operators based on the test results of the daily grab samples of mixed liquor for nitrogen and phosphate and are delivered to the treatment process via the influent structure.

#### 4.2.5 pH Adjustment

The growth rate for general bacterial population is best at a pH near 7.0 (neutral). Changes in pH impact the predominance of bacteria which result in changes in sludge quality and plant performance. When the pH gets either too high or too low, it allows the growth of bacteria that produces poor sludge flocculation, resulting in higher TSS, BOD, and ammonia in the effluent.

pH management is accomplished using a pH adjustment system that includes a 538-gallon neutralization chemical tank with agitator, pH probes, a controller, and a metering pump. This .

#### 4.2.6 Activated Sludge/Aerated Mixed Liquor Lagoon Process

The aerated lagoon is operated as a 0.7 million gallon (MG) complete mix activated sludge system. The lagoon surface aerators, clarifier, RAS, and WAS, with associated pumps, piping, and valves, collectively form the activated sludge process. In this process, aerobic microorganisms are grown in the aeration lagoon. To grow and maintain their cell metabolism, the microorganisms consume the organic matter in the waste as food. Oxygen for respiration is supplied to the microorganisms using mechanical surface aerators.

BOD is consumed in the aerated lagoon by microorganisms that break down organic material. There are many different species of microorganisms present in the aeration tank, and they consume BOD to grow and replicate. The mixture of microorganisms and wastewater in the treatment basins is termed mixed liquor. Oxygen is introduced to the aerated lagoon by mechanical surface aerators located in the aerated lagoon. Dissolved oxygen (DO) is used by the microorganisms as an energy source for breaking down organics as they are incorporated into cellular mass. Maintaining viable flocs is a key component of effective biological treatment. There are several variables called growth factors that impact the microorganism's ability to consume BOD:

- DO - sufficient oxygen must be provided to the aerated lagoon to ensure maximum BOD removal. Typically, plants will operate with a DO concentration of around 2 mg/L.
- Temperature - the temperature of the wastewater affects the growth and reproduction of the different microbial populations in the aerated lagoon, selecting for certain groups and selecting against others. Low temperatures typically inhibit the growth of nitrifying bacteria, such that a longer sludge age (time that the microorganisms remain within the available treatment volume) is necessary to support nitrification (conversion of ammonia to nitrate) of the wastewater. The temperature of the wastewater also impacts DO concentrations, with warmer wastewater containing less oxygen. The temperature of the wastewater within the secondary treatment process is generally not controllable; however, it is an important parameter to monitor.
- Hydraulic retention time - Hydraulic retention time (HRT) is the time for the mixed liquor to pass through the available treatment volume. It is important to provide sufficient time for the microorganisms to utilize the oxygen present and consume BOD. The HRT is controlled by the volume available for treatment and by the influent flow rate to the secondary process. Because influent flows and treatment objectives differ greatly between treatment facilities, HRT can vary widely.
- Food to microorganism (F:M) ratio – F:M ratio describes the amount of food (BOD) coming into the process as it relates to the quantity of solids (microorganisms) present in the treatment volume. The F:M ratio must be sufficiently high so that enough food is available to support the populations of microorganisms. If it is not, microorganisms will starve and will not be available to consume BOD. Influent BOD concentrations are not directly controllable at the treatment plant; therefore, plant staff must control the F:M ratio by controlling the amount of

solids in the treatment basins through periodic disposal of solids, a process termed wasting. Although F:M ratio is important to monitor, wasting of solids generally provides limited control.

- pH - pH is a measure of the acidity (low pH) and alkalinity (high pH) of the mixed liquor. The pH can affect the rate of growth of microorganisms as well as reaction rates for biological and chemical reactions within the aerated lagoon. Typical mixed liquor pH is between 6 and 7. Nitrification can become significantly inhibited when pH drops below 6 or rises above 8.
- Toxic substances - Toxins present in the influent wastewater can adversely affect the performance of the secondary treatment process. Toxins can kill off populations of microorganisms within the aerated lagoon by preventing them from utilizing the food and energy present and by creating an environment that selects for the growth of competing microorganisms. When the microorganisms are unable or have a diminished capacity to consume BOD due to the presence of a toxic substance, plant performance will suffer. Nitrifying bacteria tend to be more susceptible to toxins compared with heterotrophic bacteria responsible for BOD removal.

Because treatment plants cannot directly control influent wastewater characteristics it is important that a diverse population of microorganisms is maintained in the secondary process. This will help to ensure that biological treatment will not be overly susceptible to a particular growth factor and to avoid plant upsets.

The mixed liquor is pumped into the clarifier where the flocculent biosolids settle by gravity. The treated wastewater is discharged over V-notch weir plates at the top of the clarifier and settled sludge is drawn off the bottom. Most of the solids are pumped back to the aeration basin to maintain a sufficient concentration of microorganisms for proper treatment of the organic waste.

Aeration is provided by three 30 HP floating surface aerators, one 10 HP aerator, and two 40 HP aerators. One of these mechanical aerators (#4) can be brought online as needed to maintain adequate mixed liquor DO. Experience has found, however, that most of this horsepower is required to prevent excessive solids settling. DO is maintained at near saturation levels and monitored on a suspended DO meter located in the mixed liquor lagoon. This DO meter controls aerator #4 that will come on if DO levels fall below optimum levels for biological performance.

Mixed liquor is pumped from the aeration basin into the center well of the clarifier, using two 10 HP Vaughn HP Series pumps. The clarifier provides the quiescent conditions necessary to promote gravity settling and thickening of the mixed liquor suspended solids (MLSS) and proper clarification of the effluent. The clarifier is equipped with a siphon type sludge removal mechanism with adjustable sludge draw-off from each orifice in the sludge collection area. The collected sludge then flows by gravity to the return sludge pumping chamber. From this chamber, the sludge is either recycled to the aeration basin (RAS) or wasted (WAS) to the adjacent sludge holding chamber.

Clarifier effluent flow is measured and recorded in the gravity discharge line to the effluent pipe leading to the UV unit located at the north end of the property. After treatment by the UV unit, the effluent flows through an NPDES permitted outfall to the adjacent Grays Harbor Estuary.

#### 4.2.7 Chlorination of Sanitary Waste

Chlorination of the septic tank gray water is accomplished using 12.5% liquid sodium hypochlorite (bleach). The bleach is delivered from a tanker to a 510-gallon mini bulk tank that is stored in the sludge press room area. The bleach is pumped from the 510-gallon feed tank located in the sludge press room to disinfect the sanitary waste stream, prior to the sanitary waste stream's discharge into the aerated lagoon.

#### 4.2.8 Secondary Solids Handling

Sludge is wasted from the clarifier to the WAS holding chamber by activation of the WASTE switch in the Motor Control Center (MCC) room. This switches a motor-controlled valve in the RAS line to divert WAS to the chamber. Sludge is concentrated by turning air off in the WAS chamber, allowing sludge to settle by gravity, and decanting the clear water. After collection, the waste sludge is mixed using air available from the adjacent Roots Blower.

Concentrated sludge is pumped to a 2,500-gallon press feed tank in the press room by an air powered diaphragm pump.

#### 4.2.9 Sludge Dewatering

Sludge from the 2,500-gallon press feed tank is pumped directly to the Phoenix press with a Moyno pumps. The pumps, the 2,500-gallon press feed tank, and the Phoenix press are located in the Sludge Press Room. The Phoenix press system includes the belt press, Moyno feed system, polymer feed pump, and the associated controls and appurtenances. The Phoenix press is positioned on a raised platform. The dewatered sludge is conveyed via a screw conveyor into a storage/transfer trailer. Once full, the trailer is removed from the loading dock by a contracted disposal company and replaced with an empty trailer.

### 4.3 Process Component Design Summary

#### 4.3.1 Raw Waste Pumping

Pumps: Two Vaughn Chopper Pumps.

Two (2) chopper-type pumps rated at approximately 450 gpm, @ 20 HP.

Wet Well

Size: ~6 ft. diameter x 12 ft. operating depth

Operating Volume: 1,200 gallons

#### 4.3.2 Screening

Screen: One rotary screen for coarse solids removal from the entire wastewater stream.

Screen: Hycor HRS 3672, 0.020 in. slots

#### 4.3.3 Nutrient Feed System

Nutrient pump: One (1) Versa-Matic model E501A air diaphragm transfer pump. Storage/Mixing Tanks: One (1) free-standing urea 250-gallon agitated polyethylene tank. One (1) free-standing 500-gallon polyethylene storage tank. One (1) Walchem EZC20D1-VCX metering pump. One (1) free-standing 250-gallon phosphoric acid tote. One (1) Walchem EHE 45 EIVC metering pump.

#### 4.3.4 pH Adjustment System

LMI Metering Pump, 1 free-standing 4,200-gallon tank with agitator, pH probe and controller

#### 4.3.5 Activated Sludge / Aerated Lagoon Process

##### a. Aeration Basin

Basin Volume: 700,000 gallons  
Design Wastewater Flow Rate: .250 MGD  
Design Organic Loading: 1,500 lbs. BOD/day  
Design MLSS: 5,000 mg/l or 16,689 lbs.  
Volumetric Loading: 22 lbs. BOD/day/1,000 ft<sup>3</sup>

$$\text{Design MCRT} = \frac{\text{Total wt. of Solids under Aeration}}{\text{Total wt. of Solids leaving / day}} = 334$$

Food –to-Micro-Organism-Ratio: 0.12 lb. BOD/day/lb. MLVSS  
Hydraulic Detention Time: 3 days  
Oxygen Supply: Three (3) 30-HP, floating surface aerators plus 1 10-HP aerator and two 40-HP aerators.  
Lagoon transfer Pumps

Two (2) Vaughn HP series chopper pumps 400 gpm @ 40 ft. TDH

##### b. Clarifier

Tank Size: 32 feet square x 12 ft. SWD  
Tank Volume: 91,914 gallons  
Surface Area: 1,024 ft<sup>2</sup>  
Solids Loading: (100% RAS, 4,000 mg/L MLSS) 8.1 lbs. MLSS/day/ft<sup>2</sup>

Collector  
Mechanism: Circular, Center-Feed, Hydraulic Differential

##### c. RAS and WAS Pumps:

Pumps: Two (2) Vaughan Electric Submersible Pumps SE Series Model number SE 3L-460V-075 Motor: 7.5 HP 1750 RPM, 180TY Frame

#### 4.3.6 Solids Handling

- a. Sludge Holding Tank
  - Volume: 4,000 gallons
  - Materials: HDPE, open top
  - Mixer: ½ hp axial flow (Philadelphia)
- b. Polymer mix/feed system
  - Materials: Zetag POLYMER,
  - Pump: LMI
- c. Sludge Transfer Pumps
  - Type: Wilden Model M-8
  - Size: 2 inch
  - Materials: Cast Iron
  - Flow: 40 gpm @ 20 psi
- d. Sludge Belt Press
  - Type Belt
  - Manufacturer Phoenix Process Equipment Company
  - Size 1.25-meter width

#### 4.3.7 Calibration and Maintenance Schedule

- a. Ammonia Probe:
  - 1. Clean every 30 days.
  - 2. Replace the sensor cartridge every 6 months.
  - 3. Check probe for damage every 6 months.
  - 4. Calibrate every 30 days.
- b. Effluent Probe:
  - 1. Calibrate once a week.
  - 2. Change salt bridge every 6 months.
- c. Turbidity Meter:
  - 1. Calibration must be performed by personnel trained in instrument in maintenance and repair. Hach recommends recalibrating at least every four months or any time the light source replaced or adjusted.
  - 2. Clean once a week by draining it and cleaning the lens using water and dry with a clean, lint free cloth.
- d. UV System Cleaning: Once a week the UV System needs draining, and the channels hosed out. UV Bulbs need to be pulled and inspected for any debris.
- F. Dissolved Oxygen Probe: Calibrated every 6 months.

## **Chapter 5: Operation/Control - Wastewater Treatment Plant Guidelines**

### **5.1 Introduction**

This chapter addresses the specific procedures that the operators of the wastewater treatment system should follow to provide adequate treatment of the wastewater. Both routine and potential alternate operating modes are discussed.

Frequent reference should be made to the process flow schematic in Drawing P-1 (Appendix B). All major pieces of process equipment are numbered on the process flow schematic. All equipment is cataloged with manufacturers and vendors in the Plant's Maximo® maintenance management system.

### **5.2 Wastewater Collection, Pumping and Screening**

Raw process wastewaters flow by gravity to the influent wet well. From this point, influent pumps pump the water to the influent grit removal system, then to the rotary screen for coarse solids removal. Solids collected on the rotary screen are deposited in a waste bin, and screened wastewater flows by gravity to the 1,000-gallon mix tank.

The influent pumping and screening systems require daily attention. The pumps and influent wet well should be examined daily for foreign objects, presence of unusual waste materials, and any other abnormal operating conditions. Attention should be given to fouling or other problems with the level sensors in the sump. The rotary screen drum is self-cleaning, but sometimes it clogs due to accumulated fine solids and biological growth. If the screen becomes clogged, it can be cleaned with a hose, power washer, or non-damaging brush and appropriate solvent, such as detergent and/or mild acid or caustic.

The bin, which collects the screenings, should be checked frequently, and emptied at least once per week. The hopper should be rinsed and cleaned as necessary, to prevent the occurrence of nuisance odors.

### **5.3 Nutrient Feed System**

Nutrient management is accomplished through the monitoring of the residual phosphate and nitrogen compounds in the effluent and mixed liquor. Phosphate, in the form of phosphoric acid, is added when the residual is below 1 ppm, and nitrogen, in the form of urea, is added when the residual is below 1 ppm.

Nutrient management is accomplished through the use of a nutrient addition system, which includes a 250-gallon urea mixing tank, 500-gallon urea storage tank, 510-gallon phosphoric acid tank, and metering pumps installed in the equipment room. Urea is batch mixed into a liquid solution and dosage rates are manually set based on daily grab sample readings. Nutrients which are to be added, include phosphoric acid and urea. The urea is delivered in 50-pound bags on pallets, and the phosphoric acid is delivered in Univar Mini-Bulk. The metering pumps deliver the urea solution and phosphoric acid to the treatment process at the influent structure.

In order to maintain adequate nutrient levels for biological activity to occur, a ratio of BOD:N:P of approximately 100:5:1 should exist. Should the N or P levels fall below the desired level, supplementary N and P must be added using one or more of the chemicals described above. Nutrient values for these chemicals are shown below.

Chemical	Formula	Fractional /Qty of Nutrient Lbs./lb.	
		N	P
Urea	CO(NH <sub>2</sub> ) <sub>2</sub>	0.46	0

Example Calculation:

Make-up required:  $N = 900 \times .05 = 45 - 30 = 15 \text{ mg/L}$   
 $P = 900 \times .01 = 9 - 3 = 6 \text{ mg/L}$

Using Urea:  $N = (15 \times 0.175 \text{ MGD} \times 8.34) / 0.46 = 47.6 \text{ lbs}$   
 Phosphoric Acid:  $P = (6 \times 0.175 \text{ MGD} \times 8.34) / 0.52 = 16.8 \text{ lbs}$

Example Calculation.

Assume: Flow = .175 MGD  
 COD to Aeration = 1500 mg/L  
 BOD: COD of influent = 0.6  
 N in raw waste = 30 mg/L  
 P in raw waste = 3 mg/L

Then calculated BOD =  $0.6 \times 1500 - 900 \text{ mg/L}$

Required Nutrient Ratio = 100:5:1

Actual Nutrient ratio = 900:30:3 = 100:3.3:0.33

Both N and P are required.

Make-up required:  $N = 900 \times .05 = 45 - 30 = 15 \text{ mg/L}$   
 $P = 900 \times .01 = 9 - 3 = 6 \text{ mg/L}$

Require  $(15 \times 0.175 \text{ MGD} \times 8.34) - 9.8 = 12.0 \text{ lbs additional}$

Using Urea:  $12.0 / 0.452 = 27 \text{ lbs Urea}$

Thus, the appropriate amounts of Urea to satisfy the theoretical nutrient requirements are:

Urea: 27 lbs

#### 5.4 pH Adjustment

Low pH conditions in the treatment plant influent are adjusted with the addition of neutralization chemicals. When the pH falls to a low level, neutralization chemical is added by means of a metering pump. Neutralization chemical is added until the pH returns to a normal level.

#### 5.5 Aerated Lagoon

The remainder of the lagoon is to be operated as a 0.7 MG complete mix, activated sludge/aerated lagoon system. Some activated sludge systems operate in the declining growth, or endogenous, phase. In this operating mode, there is just enough food (BOD) provided to the microorganisms to maintain a desired bacterial growth and controlled auto-oxidation of the bacteria. The volatile (MLVSS) fraction of the mixed liquor suspended solids (MLSS) remains relatively constant, and high, at approximately 79-90 percent.

In an extended aeration activated sludge system, the food is severely limiting, and the system operates deeply into the endogenous phase, very near the auto-oxidation (digestion) phase. Consequently, nearly all the food is consumed, but a considerable level of sludge digestion is also achieved in this type of system.

Operation of the aerated lagoon is best achieved by controlling the solids level in the system. Since little can be done to control the concentration and flow of wastewater to the system, consistency of operation must be controlled by maintaining solids inventory to satisfy the load. Consider the following example of the food to microorganism ratio (F:M).

Example Calculation:

Assume: Desired feed rate to the system is 0.1 lbs BOD/day per lb of active biomass present in the system.

Thus, the Food to Microorganism ratio, F:M,

$$F:M = 0.1 \text{ lbs BOD/day-lb MLVSS}$$

Assume: Flow = 175,000 gal/day  
BOD to aerated lagoon = 1,500 mg/L

$$\text{BOD load} = 0.175 \text{ MGD} \times 1,500 \times 8.34 = 2,189 \text{ lbs/day}$$

$$\text{Then, } 2,189/\text{MLVSS} = 0.1$$

$$\text{or } \text{MLVSS} = 21,890 \text{ lbs}$$

Converting to concentration of MLVSS in aerated lagoon,

$$\text{MLVSS} = 21,890 / (1.4 \text{ MG} \times 8.34)$$

$$\text{MLVSS} = 1,875 \text{ mg/L}$$

Assuming a volatile fraction of 67 percent, the total suspended solids level in the aerated lagoon should be:

$$\text{MLSS} = 1,875/0.67 = 2,800 \text{ mg/L}$$

To adequately treat this load under these operating conditions.

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As wastewater characteristics or flows vary, or plant shut-down periods occur, the active biomass required to treat the waste can be adjusted as required. This is accomplished by controlled wasting of the biomass to the sludge storage and dewatering system. A typical operating scenario follows.

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Example Calculation:

Assume: MLSS desired = 2,800 mg/L, as determined by above method.

Lagoon effluent pumps have been set to achieve the desired 7-day effluent flow from the new clarifier.

Clarifier return sludge pumps have been set to approximately 50 percent of the total forward flow. These pumps will be adjusted only to compensate for variations in the sludge blanket depth in the clarifier. These adjustments are operator – defined and will be established as his or her level of comfort with the system increases.

Calculation of sludge wastage rate:

The operator uses the influent TSS and COD data to estimate the wastage rate by the following formulae, to achieve an effluent quality of:

$$\text{BOD} = 50 \text{ mg/L}$$

$$\text{TSS} = 50 \text{ mg/L}$$

Suspended solids accumulation in the system consists of the following:

- Influent TSS
- + TSS produced by biological synthesis
- TSS lost to endogenous biological activity
- TSS lost to the effluent

Assume: Flow = 175,000 gpd  
TSS influent = 250 mg/L  
BOD influent = 1,500 mg/L  
TSS effluent = 50 mg/L  
BOD effluent = 50 mg/L

Net biosolids production (synthesis – endogenous) = 0.48 lbs TSS/lb BOD removed

Then the net solids accumulation is:

Solids Production (lbs/day) =

$$0.175 \text{ MGD} \times 8.34 [(250 - 50) + 0.48 (1,500 - 50)] = 1,308 \text{ lbs/day}$$

Since excess solids produced per day becomes solids to be disposed, this term becomes Waste Activated Sludge (WAS).

$$\text{WAS} = 1,308 \text{ lbs/day}$$

Normally, a secondary clarifier will achieve settled sludge concentrations of approximately one percent, or 10,000 mg/L. At this concentration, the volume of waste sludge becomes:

$$\begin{aligned} \text{WAS} &= 1,308 \text{ lbs/day} / 0.01 = 186,800 \text{ lbs wet sludge/day} \\ &= 130,800 \text{ lbs/day} / 8.34 \text{ lbs/gal} = 15,700 \text{ gal/day} \end{aligned}$$

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The calculation presented above is intended for use as a guideline for operator management. As with all biological systems, operator attention is required to ensure the system is operating consistent with the indicating instrumentation.

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## 5.6 Clarification

A 32-foot square clarifier is installed above ground, on piling, beside the lagoon. The clarifier is part of a 44 x 32 ft. inside dimension structure which contains three separate basins, including:

- 32 ft. square clarifier mechanism in a 32-ft. square clarifier tank
- 12 x 28 ft. sludge holding basin
- 12 x 4 ft. RAS pumping basin

The entire structure is approximately 16 feet high.

The secondary clarifier is used to separate the treated wastewater from the microorganisms. Unless the secondary clarifier has design or mechanical problems, its performance merely reflects the sludge quality produced in the aerated lagoon; if a clarifier is discharging high BOD and TSS, it is the result of the poor sludge quality produced in the aerated lagoon. To correct the problem, the operator must

go back to the aerated lagoon and change the environment, or growth factors, as discussed earlier in Chapter 4 (4.2.6). The change in environment results in a change in the microbial predominance, which ultimately results in a change in the sludge quality and improved secondary clarifier effluent.

The clarifier surface should be examined daily, at minimum, for symptoms of floating sludge, rising gas, sour or septic odors, pin floc passing over the weir, etc. The operator should address the symptom accordingly.

The clarifier is an important process control mechanism for the treatment plant and great care must be taken to ensure the operator has a thorough understanding of the clarifier's operation and control.

The clarifier is typically designed from two standpoints: clarification of effluent and thickening of sludge. The clarification function is controlled by overflow rate (OR), the rate at which the effluent flows over the weirs. This function is expressed in terms of unit surface area of the clarifier:

$$\text{OR} = \frac{\text{Forward Flow, } Q, \text{ gpd}}{\text{Clarifier Surface Area, sq ft}} = \text{gpd/sq ft}$$

The overflow rate is based upon the settling velocity of the floc within the clarifier. Its units of measurement indicate that the performance of the clarifier is a function of surface area, rather than depth. This is shown by the following example.

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Example: A laboratory sample of MLSS has been collected, and a settling rate test has been performed by measuring the sludge interface in a 1.0 L graduated cylinder for a period of time. The sludge settles uniformly for a period of 30 minutes to a final concentration of 300 mL.

Note: Most 1.0 L graduate cylinders measure 1.12 ft. from the 0 to 1,000 mL graduations.

Since the sludge settles uniformly during this period, a graph of height vs. time will appear linear for the 30-minute period.

$$\text{Settling Velocity} = V S = \frac{[(1,000 - 300)/1,000] \times 1.12}{0.5 \text{ hours}} = 1.57 \text{ ft/hr}$$

This corresponds to an allowable overflow rate, OR, of:

$$1.57 \text{ ft/hr} \times 24 \text{ hr/day} \times 7.48 \text{ gal/cu ft} = 282 \text{ gpd/sq ft}$$

The allowable overflow rate is calculated directly from the sludge settling velocity.

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For the Aberdeen plant, a flow of 150,000 gpd would provide the following overflow rate:

$$\text{OR} = \frac{150,000 \text{ gpd}}{32 \text{ ft} \times 32 \text{ ft}} = 146 \text{ gpd/sq ft}$$

This is a conservative overflow rate for secondary clarifiers. Normally, such clarifiers are designed for overflow rates of 500 to 800 gpd/sq.ft. Thus, the unit should have considerable excess capacity.

From a sludge thickening standpoint, clarifiers are normally designed on the basis of a unit flux loading, expressed as lbs. solids applied/day/sq.ft. of clarifier surface. Normally, as the applied solids flux is increased, the concentration of the sludge at the bottom of the clarifier increases. This relationship holds up to the point where the quality of the clarifier effluent begins to deteriorate due to solids overload.

At the Aberdeen facility, the sludge is less dense than most typical activated sludge, at least during the cold weather start-up period. This situation is likely to change when the ambient temperature and the waste load both increase.

To control the plant operation, polymer can be added to the clarifier influent to enhance settling. The sludge responds well to the addition of the polymer, often thickening to the point where removal from the clarifier becomes a problem.

The clarifier is designed to provide minimum sludge holding time. The approach is to return the active solids to the aeration basin as quickly as possible, to keep them working efficiently. Rather than employing a timed sludge withdrawal, the sludge suction pipes are constantly removing sludge by maintaining a slight hydraulic head differential between the clarifier surface and the top of the sludge suction tubes. Sludge from the tubes is collected in the clarifier skimmer troughs and flows by gravity to the RAS pump sump. Under normal operating conditions, the minimum operable RAS rate for the clarifier is 200 gpm.

Operators should determine secondary clarifier blanket depth at least once per shift, and more frequently during high flows or when experiencing high SVIs. The information can indicate RAS pump problems or failures, plugged or broken draft tubes, broken or damaged rake arms, and incorrect RAS pumping rates.

On a square clarifier, like the one at OSC, the average blanket depth is measured at one-half the length of the tank. The location should be marked so that all operators check the sludge blanket depth in the same location.

The most common method of measuring blanket depth in the secondary clarifier is by using a core sampler, or "sludge judge." The measurement is direct and provides a good profile of the settled sludge blanket, interface, and decant. OSC utilizes a sludge sensor to monitor sludge blanket levels in the secondary clarifier.

Maintenance of the primary clarifier consists primarily of daily inspections and lubrication of moving parts on a scheduled basis. Daily maintenance consists of inspection of the effluent weirs for clogging, out-of-level, flooding, etc.; examination of return sludge boxes for blockages or uneven flow; and examination of the surface skimming device to ensure constant, smooth movement. Since the clarifier is the heart of the solids management system, any operating problems incurred should be investigated and promptly corrected.

## Chapter 6: Sludge Management Operation/Control Guidelines

### 6.1 Introduction

The clarifier uses a suction-type sludge removal mechanism with adjustable sludge draw-off capability from each orifice. Sludge will be transferred from the clarifier to the sludge pumping basin by means of hydraulic differential.

Return sludge flows by gravity to the return sludge pumping basin where it is pumped at a flow-controlled rate to the outlet box of the screening facility. After mixing with the influent stream the return sludge then flows to the lagoon system.

Waste sludge is transferred to the sludge holding basin by regulating a three-way valve in the RAS line. The valve is normally diverted to the WAS holding basin by turning a switch in the control room that manually switches the valve

### 6.2 Clarifier State Point Analysis Tool

During times of questionable sludge settling and high influent flows, it can be difficult to determine the best balance of RAS flow and effluent flow in the clarifier to achieve maximum effluent flows while avoiding solids washout. The Callan & Brooks Clarifier State Point Analysis (SPA) tool is useful in predicting clarifier blanket behavior. This tool is an Excel based software program that utilizes a variety of wastewater physical features, as well as current test data, to allow the operator to test different flow rates and solids concentrations in the model to determine proper settings for the wastewater system.

The two main components of the activated sludge process are the aerated lagoon and the secondary clarifier. In the aerated lagoon, organic waste is converted into biomass by a suspension of microbes collectively known as mixed liquor. The mixed liquor is then settled out in the secondary clarifiers to separate the biomass from the clean effluent. A portion of the settled biomass is wasted from the system as WAS, while the remainder is recycled back to the aeration basins as RAS. Ideally the RAS rate should be set at a rate that pulls solids off the bottom of the clarifier at the same rate they are being applied.

The SPA utilizes a graphical technique to analyze the operation of the secondary clarifier. The factors that impact secondary clarifier operation can be broadly grouped into two categories – a) those relating to the settleability of the mixed liquor, and b) those relating to the operational parameters of the clarifier. The SPA evaluates the impact of both these sets of factors by incorporating them into a graph of solids flux (mass of solids per unit area per unit time) versus solids concentration.

## Chapter 7: Operations Techniques

### 7.1 Introduction

This chapter is an extension of Chapters 3 and 4. Where the earlier chapters presented operational methods and mathematical approaches to process control, this chapter is intended to provide operational short-cuts using process control strategies.

The chapter will be organized according to unit process within the treatment plant. In some instances, several unit processes may be grouped together, if control parameters are interrelated. Not all unit processes will be addressed in this chapter, only those which may impact process control through operational input.

### 7.2 Nutrient Feed System

The first operational control area encountered as wastewater flows through the plant is the nutrient feed system. Nutrient control is of the utmost importance at the wastewater treatment facility, particularly since the system retention time is very long. Nutrients should be added to the system to match the theoretical requirement as closely as possible. Shortages of nutrients in the aeration basin will result in poor treatment plant performance. Excessive nutrients could be toxic to the system, or even add unwanted nitrogen and phosphorus to the estuary.

In the activated sludge process, slime bulking is caused by nutrient deficiency. Bacteria require nutrients to build new bacterial walls. When they have food but insufficient nutrients, they excrete excess polysaccharide slime. The slime fills the voids in the floc, making it more buoyant and harder to settle and compact. Nitrogen and/or phosphorus is usually the limited nutrient. Nutrients should be fed to the RAS to ensure their availability when microbes contact influent food.

### 7.3 Aerated Lagoon

In an extended aeration system, food (BOD) is designed to be the limiting parameter. The system operates deeply into the endogenous phase, very near the auto-oxidation (digestion) phase. These systems are characterized by very low F:M ratios, low volatile content of the sludge, and relatively low net sludge production.

The desired F:M ranges from approximately 0.05 to 0.2, with optimum loadings in the range of 0.1 to 0.15. While the system can operate for short periods outside these limits, extended operation can cause operational problems, such as poor settling, foaming, reduced performance, etc.

Because the F:M math relies on BOD in its formula, it makes it very impractical for day-to-day process control. Conditions in the activated sludge process are so dynamic that during the 5-day wait for BOD results, the conditions have changed dramatically. Thus, F:M ratio is a good historical reference and can be useful in establishing inventory goals. Additionally, as wastewater characteristics or flows vary, or plant shut-down periods occur, the active biomass required to treat the waste can be adjusted as required, based on the F:M ratio.

Sludge quality indicators are those non-data related observations that operators often use to make decisions regarding wasting, or inventory control. These indicators are useful for refining the activated sludge WAS rate but are rarely successful as stand-alone control methods. Some sludge quality indicators include:

- Color and amount of foam
- Microscopic findings
- SVI
- Settleometer

#### **7.4 Activated Sludge Control**

As discussed in Chapter 5, there may be times when it is desirable to adjust the level of biomass in the aeration basin. It is important that operators apply the information/knowledge about activated sludge to proactively control the process.

In the activated sludge process, RAS is used as a distribution tool. RAS rates determine the percentage of solids distributed in the aerated lagoon and in the secondary clarifier. Ideally, the RAS rate should be set at a rate that pulls solids off the bottom of the clarifier at the same rate that they are applied. This is referred to as mass balance. If the RAS rate is too low, a sludge blanket accumulates in the secondary clarifier. If the RAS rate is too high, the increased hydraulic loading on the aerated lagoon causes an increase in solids loading on the secondary clarifier and increases its surface overflow rates. These conditions also result in higher secondary clarifier blankets because the increased velocity hinders sedimentation and compaction. It is best to operate the RAS at the lowest rate that does not accumulate a blanket in the clarifier.

WAS can be thought of as the “inventory control” for the activated sludge process. The WAS rate is set to maintain the desired mass of microorganisms for the amount of food entering the system. It is known the quality of the activated sludge produced is influenced by the food to microorganism ratio. All methods of WAS control aim to achieve this balance in the system by managing inventory. Although there are many methods of WAS control, the method utilized by the OSC facility is constant mixed liquor suspended solids, or MLSS.

Constant MLSS is the most common method of inventory control. Through experience, trend charting, or some other means, OSC operators will select a mixed liquor concentration that produces a good sludge quality. The operators then waste solids to maintain this concentration. The ease of this method is its advantage. The disadvantage is that it does not take into consideration changes in the F:M ratio.

Another concern related to activated sludge control is filamentous bacteria. Filamentous bacteria cause most activated sludge bulking. The hair-like bacteria physically bridge the floc and hold it apart, impeding flocculation, sedimentation, and compaction. A growth pressure that favors filament bacteria causes excessive growth of filaments. Therefore, the growth pressure is the key to fixing filamentous bacteria problems. In other words, once the filamentous bacteria are identified through microscopic evaluation, changing the aerated lagoon environment to disfavor the filament will result in a decrease in their numbers.

## 7.5 Sludge Dewatering

Sludge dewatering at the facility is accomplished by a belt press. This system uses liquid polymer to condition sludge prior to feeding the press. To determine the correct polymer dosage, a bench-scale screening test can be performed using a 1-L sample of sludge and the polymer from the tank. Estimate the TSS of the sludge. Polymer should be added to the sludge sample with a syringe and mixed uniformly. When a pea-sized, sturdy, settleable floc is formed, record the quantity of polymer added in mL.

When running, the belt filter press operates in a continuous manner and consists of two endless belts traveling over a series of rollers. Sludge, conditioned with polymer to coagulate the solids, is pumped and applied to the gravity zone of the belt. This zone allows most of the free water to drain by gravity through the filter and to be collected by a trough underneath the belt. The partially dewatered solids are then carried to the wedge zone, where they are trapped between the two endless belts. The entrapped solids are further dewatered as they travel through the pressure zone. The solids are subjected to shearing forces as they proceed over the rollers, and water is forced from between the belts. The dewatered sludge is scraped from the two belts as they separate at the discharge end of the belt filter press and is conveyed by auger to the sludge trailers. The two endless belts are then washed to prevent plugging by fine solids before beginning the process again. All water removed from the solids (filtrate) and the belt wash water flow by gravity to the influent structure.

The performance of the belt filter press is dependent on many variables. Understanding how individual changes in the dewatering process can affect the cake solids concentration will aid the operator in making the correct adjustments. In addition, process variables are dependent on other process variables. For this reason, process adjustments should be done in small increments and to one variable at a time. A suggested order for adjusting the process is:

- a. Adjust the sludge feed rate to achieve the desired flow rate.
- b. Adjust the polymer feed rate for proper flocculation.
- c. Adjust the belt speed.

A log of the changes made, and the results, should be maintained. A close watch over the belt filter press operation is expected until the operators develop a measure of comfort with the reliability of the equipment. After a period of time, though, it is anticipated that with field experience and equipment optimization the operators will be able to run the equipment with occasional monitoring.

The belt filter press variables that affect process performance are described below.

### 1. Sludge Concentration

Since sludge concentration affects belt filter press performance, it is essential the characteristics of the sludge being dewatered remain relatively constant. Even a seemingly small change may require a significant adjustment in polymer dosage, belt speed, or sludge feed rate. Since a higher sludge concentration requires a lower chemical dosage, the operator should attempt to feed as thick of sludge as possible. This can be accomplished by decanting the water off of the solids in the waste chamber before pumping to the sludge tank.

## 2. Sludge Feed Rate

The sludge feed rate (flow) can be adjusted by the operator to optimize the belt press performance. Since the goal of OSC is to run the belt presses as infrequently as possible, it is critical for the operators to process as much sludge while the equipment is operating. However, balance between belt speed and sludge feed rate is critical. This is especially true if “washing out” is occurring. If the polymer dosage is producing large floc particles and free water, and the belt speed is higher than normal to provide more belt surface area for drainage, then the sludge feed rate may have to be reduced to prevent “washing out.” “Washing out” means that any water that isn’t released in the drainage zone is carried over to the dewatering, or pressure zone. This condition causes the sludge to flow out from between the belts, reducing filtrate quality and affecting the dryness of the dewatered sludge.

## 3. Polymer Dose and Feed Rate

Sludge applied to the belt press is pre-conditioned, usually with polymers. This pre-conditioning causes the solids to agglomerate, or clump together. This process is called flocculation and controls to some extent the dewatering characteristics of the sludge. To optimize the dewatering process, it is essential to select the proper polymer type, the proper dosage, and the proper feed rate. Since all excess polymer is wasted in the filtrate, it is cost-effective to inject it at the lowest dose and feed rate required for dewatering.

Polymer dosage generally depends on the type of sludge being applied to the belt press and should be determined by jar testing and bench-scale simulation tests. It is also understood that overdosing polymer can be worse than no polymer addition at all. In general, a lower solids concentration usually requires a higher chemical dose.

The polymer dose is closely associated with the feed rate. The feed rate is the rate at which the metering pumps accurately control the desired dosage. If the polymer dosage needs to be increased, then a corresponding increase in the feed rate is required. With time and experience an operator can visibly determine if the polymer is being fed at the proper rate. An adequate polymer feed rate is evidenced by large floc particles and free water in the free water drainage zone of the belt press. Additionally, samples of the cake should be analyzed to determine if changes in the polymer dose/feed rate improved belt filter press performance.

## 4. Belt Speed

Belt speed depends on two factors: sludge flow rate and sludge concentration. Since most of the water in the sludge is removed in the free water drainage zone (gravity section), it is important to provide sufficient belt area for the water to drain. The amount of belt area is determined by the belt speed. As the speed increases, the amount of belt area also increases, and more water is able to drain from the sludge. If the belt area is not sufficient, a “washing out” of the belt will occur.

Control of the belt speed should result in sludge with minimal amount of water being delivered to the pressure zone. Time and experience will enable the operator to optimize the belt speed by observing the dryness of the sludge delivered to the pressure zone.

As sludge concentration increases, the water concentration decreases, and reduced belt speeds can be used. A slower belt speed results in a dryer cake because the sludge is subjected to the pressure zone for a longer period of time.

*THE OPTIMUM BELT SPEED IS THE SLOWEST THE OPERATOR CAN MAINTAIN WITHOUT "WASHING OUT" THE BELT.*

## **Chapter 8: Non-Routine Operation**

### **8.1 Introduction**

Chapter 8 is designed to give operating guidelines for periods of non-routine operation. Non-routine operation means one of three things:

1. Operation during cold weather.
2. Operation during manufacturing shut-down periods.
3. Combination of (1) and (2).

Each of these conditions presents its own set of operating problems, which will be addressed in this chapter. A brief discussion of warm weather operation is not included, as this is not expected to be a problem at the Aberdeen facility.

### **8.2 Cold Weather Operation**

Occasionally, cold weather will present operational problems at the facility. Extremely cold/freezing temperatures can have marked effects on physical treatment schemes, such as screening and settling, as well as biological oxidation and chemical treatment operations.

This section will be presented as a plant “walk-through” to discuss the problems, which may occur when severely cold weather conditions exist.

#### **8.2.1 Raw Waste Pumping**

Cold weather should not affect the pumping of raw waste, from the process standpoint. From a mechanical standpoint, lighter lubricants may be recommended during cold weather. Furthermore, pumps should not be left inactive for long periods of time to prevent local freezing of the wetter parts.

#### **8.2.2 Influent Control Structure/Screening.**

During sub-freezing conditions, it is likely that the small openings in the wedge wire screen dump will freeze, causing a bypass of the screening process, and excessive water in the screenings. During these frozen conditions, the screen should operate continuously to prevent freezing. The water rinsing can also be set on manual to prevent the pipes from freezing.

#### **8.2.3 Aeration Basin**

The most significant cold weather effect on the WWTP will take place in the aeration basin. A temperature drop from 30°C (86°F) in August, to 5°C (41°F) in November, will result in nearly 66% reduction in biological activity. In other words, for the same BOD load to the system, approximately 66% more biosolids will be required to stabilize the waste in November than in August.

From an operator’s standpoint, cold weather conditions mandate a reduction in F:M as compared to warm weather conditions.

In order to lower the F:M in the basin, the solids level must be increased, assuming the BOD loading remains the same. This increases the sludge age in the system, and consequently reduces the volatile content of the solids. Dispersed floc, poor clarifier settling performance, and some foaming in the basin may occur as a result.

These problems must be addressed on a case-by-case basis, since variability may cause them to arise at any time.

#### 8.2.4 Clarifier

As previously mentioned, cold weather operation may result in a dispersed floc which settles poorly. While these bacteria are functional in removing BOD, they do not agglomerate well enough on their own to settle. As water temperature decreases, water becomes denser, increasing the resistance to floc settling, resulting in lower removal efficiencies and poorer effluent quality.

Normal biological sludges maintain a slightly negative charge. This charge is not normally sufficient to overcome the natural gravitational attraction of sludge particles. Thus, the sludge will normally flocculate, form heavier particles, and settle. If the sludge does not flocculate, small dosages of coagulant/flocculent will stabilize the net charge and produce the desired result. This is the reason most biological sludges respond well to cationic coagulants/flocculants such as alum, ferric chloride, and cationic polymers.

Biological sludges, which are allowed to proceed into the auto-oxidation (digestion) phase, may experience a charge increase due to the decrease in organic content. In the extreme case, charges will even reverse, resulting in a net positive charge.

When the charge is increased, gravity may no longer be strong enough to overcome the electrical repulsive forces. Once again, small doses of cationic polymer should be adequate to bring the particles together and encourage settling. If the cationic polymer does not work properly, the sludge may have passed the critical charge reversal point, and an anionic polymer may be necessary for short periods.

### 8.3 Shut-Down or Low Load Conditions

It is very often necessary for food processing facilities to shut down processing operations for a period of days, or weeks, to accommodate holiday periods, to retool, add another process line, or change products. During these periods, the WWTP receives two shock conditions:

1. Complete elimination of food supply for an extended period, followed by
2. An instantaneous resumption of full waste load upon start-up after the shut-down period.

These two conditions will inevitably cause upset to the WWTP operation. If not properly anticipated and counteracted, the impact to the WWTP could be devastating.

Successful operation under low load conditions should be achievable if the activities are planned and acted upon well in advance of the shutdown. The major objectives of these preparations are: first, to attempt to operate the plant during the shutdown in a manner as close as possible to normal operation; and second, to have the plant ready for full loading conditions on the day of start-up.

Several weeks prior to the shutdown, preparations should begin at the WWTP. If the shutdown is expected to be long (more than 4 or 5 days), operators should discontinue sludge dewatering operations. Rather, sludge should be wasted to the holding tank, decanted, and aerated. Some process wastewater or off-spec product should be added to this basin daily, right through the shutdown period. This will provide a source of acclimated seed bacteria, if needed, after the shutdown. The operator should perform an oxygen uptake rate (OUR) test on the contents of this tank at least twice per week to ensure there is an adequate feed to keep the system viable.

Approximately 1 week prior to shut down, storage of sludge to the holding tank should peak to reduce the MLSS concentration, and the level of the lagoon should be allowed to come up. By operating at a higher F:M the final week prior to shut down, the synthesized bacteria should be relatively young and better able to withstand starvation periods. In addition, there is less likelihood of excessive auto-oxidation, possibly resulting in a change of net electrical charge, and the need to re-evaluate polymers. During this period, the operator should also allow the aeration basin to build up in volume, in order to be able to pump through the clarifier during the shutdown.

Once the plant shuts down, the operator should be aware of its planned duration. This allows the operator to calculate the quantity of flow he can pump each day to the clarifier, based upon the build-up in the basin, and the minimum desired operating level. The flow control valve should be set to pump this constant volume each day.

Upon restarting the manufacturing operation, the thickened, aerated sludge in the holding tank can be fed back into the system to ensure enough viable sludge is available for a smooth start-up at a reasonable F:M. Furthermore, the aeration basin level should be relatively low at the time of start-up, providing some time for additional holding, in the event the plant is not performing at 100 percent at start-up.

#### **8.4 Combined Cold Weather and Low Load**

This section will contain very little discussion, since the measures taken for cold weather operation and low loading conditions are somewhat complementary.

The mechanical recommendations for cold weather operation should be implemented as soon as the cold weather arrives. If a shutdown occurs during this period, the F:M will be reduced by default, thus enhancing cold weather performance. When the plant returns the full load, the inventoried solids in the WAS holding basin will aid in keeping the F:M low for the balance of the cold weather.

## Chapter 9: Maintenance

### 9.1 Introduction

Maintenance is work devoted to keeping a plant operating. It can be classified as either corrective or preventive. Corrective maintenance concerns the repair of equipment after breakdown, while preventive maintenance is work scheduled in an effort to minimize or eliminate breakdowns. Preventive maintenance assures maximum safety and reliability of system operation, as well as protecting Ocean Spray's investment in equipment.

Preventive maintenance involves continuous equipment surveillance and servicing on a planned and scheduled basis. This maintenance should be performed on machinery, tankage, piping, valves, electrical equipment, and the buildings themselves.

This overview describes procedures for inspecting the facility and for maintenance to be performed on a routine basis. For detailed maintenance guidelines, operator checklists, troubleshooting guides and corrective maintenance procedures associated with a particular system or piece of equipment, refer to the manufacturer's technical manual.

### 9.2 Inspection

The facilities should be inspected at least once per day as a routine, and more often if there are equipment or process problems. Log sheets should be provided to record any unusual conditions. The three general areas of inspection are:

- Visual. Check for flooding, spillage, lubricant, chemical, or water leakage. Check indicators and gauges.
- Sound. Listen for unusual noises from equipment and pipes which may indicate bearing and part wear, hydraulic or pneumatic problems.
- Touch. Vibration and/or excessive temperatures may indicate bearing lubrication failure, misalignment or hydraulic or pneumatic problems. **Note:** Care and reason must be exercised in touching any equipment, especially while it is in operation or even when not running but connected to a power source.

### 9.3 Operator's Checklist

The operator checking the system should know what conditions, including numbers in readouts and on gauges, indicate normal operations. If abnormal conditions are encountered, they should not only be recorded, but also reported and reasonable action taken as required.

For operator inspection of particular equipment and systems, refer to the manufacturers' manuals. As a minimum, the operator's daily checklist should include the following items:

- Influent Wet Well
  - Check for noise, vibration, and high temperature on the influent pumps
  - Check piping and valves for leakage
  - Check for fouling of the floats
- pH Adjustment
  - Check piping and valves for leakage
  - Check chemical storage tank for leakage

- Check for noise and vibration on the chemical metering pump
- Preliminary Treatment (Screening)
  - Check piping and valves for leakage
  - Check for noise, vibration, and high temperature on the fine screen
  - Check the screen for fouling from sump debris
- Aerated Lagoon
  - Check piping and valves for leakage
  - Check for noise and vibration on the floating aerators
  - Confirm readings on the RAS pump flow meters
  - Confirm readings on the DO meters
  - Check for the presence of foam
- Chemical Systems
  - Check chemical systems for leakage
  - Check chemical storage tanks for leakage
  - Check level in chemical tanks for reordering purposes and batches
- Solids Dewatering
  - Check piping and valves for leakage
  - Check for noise and vibration on the belt press
  - Check Polymer tank level
- Disinfection
  - Check piping and valves for leakage
  - Confirm that the UV unit is operating
  - Confirm readings on the turbidimeter

To be a reliable system, the wastewater operations equipment requires routine maintenance. Additionally, adequate inventories of replacement parts and assemblies are necessary to enact emergency repairs when unexpected failures occur.

#### **9.4 Maintenance System**

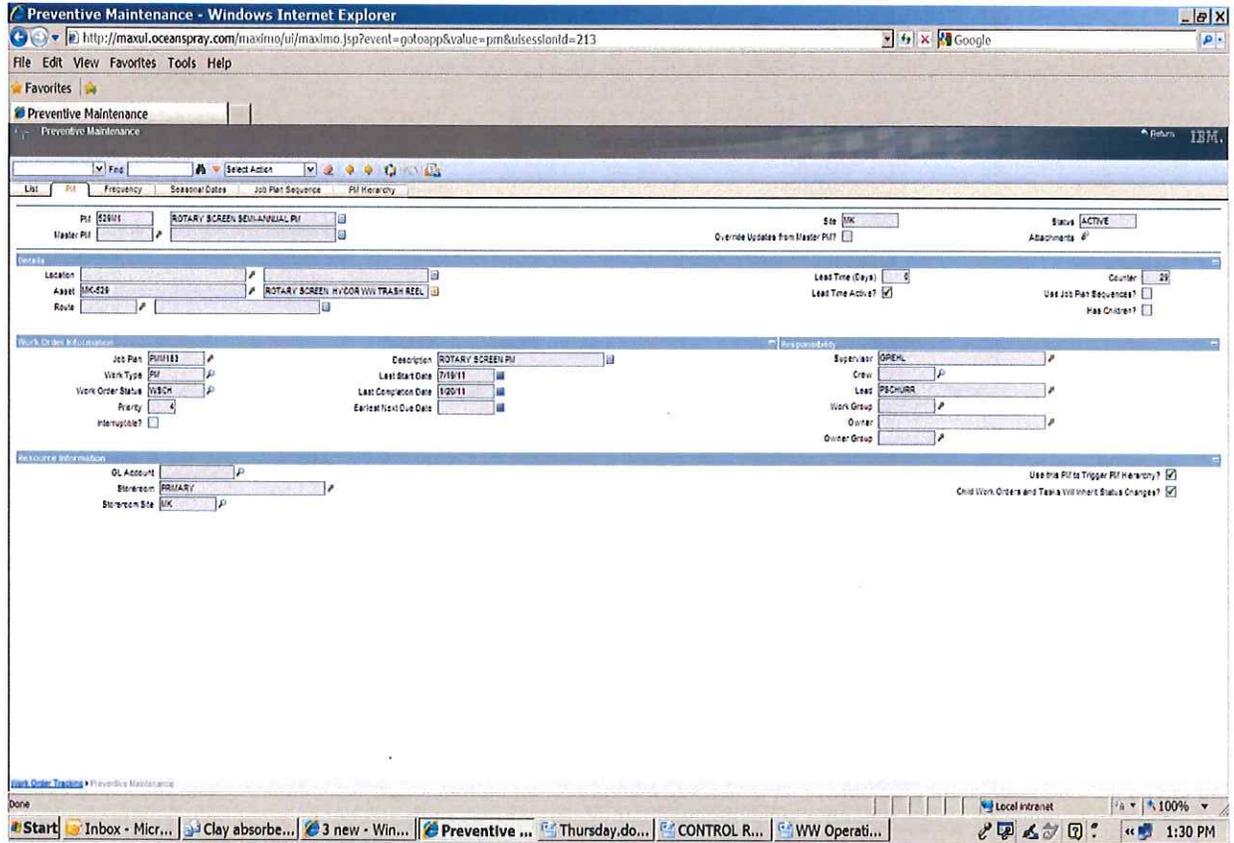
The Maintenance System summarizes routine maintenance activities and required maintenance frequency for major equipment and systems at the plant. This information is excerpted from the recommended maintenance procedures presented in the manufacturers' technical manuals. Information in this table does not supersede maintenance procedures outlined in the manufacturers' manuals. Operators should refer to the manufacturer's equipment manuals for detailed descriptions of maintenance requirements and for suggested lubricants, quantities, and procedures.

It is assumed the manufacturer's recommended frequency of routine maintenance will be revised to reflect the frequency of equipment use. Daily maintenance may not be required for equipment which is used only once or twice per month. More frequent maintenance may be required for equipment which operates continuously. When a piece of equipment has been idle for an extended time, recommended maintenance procedures should be followed prior to use. Items, which require "periodic" maintenance or maintenance "as needed," should be addressed annually at a minimum. Questions concerning specific equipment maintenance procedures or frequency should be addressed to the manufacturer.

Ocean Spray Cranberries utilizes the MaximoV7® maintenance management software for all aspects of maintenance planning, scheduling, purchasing, equipment records, and parts inventories. The

WWTP utilizes this software system for these purposes. All of the regular maintenance that is required on the system is automatically scheduled through this system and work orders are generated for completion. All spare parts are cataloged in this system and inventories are managed through the work order and purchase order systems. All of the equipment is also cataloged into the system, as are the equipment manufacturers and vendors.

The following are example screen shots of MaximoV7® preventative maintenance, equipment, work order, inventory, and vendor/manufacturer screens.



Work Order Tracking - Windows Internet Explorer

http://maxul.oceanspray.com/maximo/af/maximo.jsp?event=render&targetid=worktrack&value=render&businessid=213

File Edit View Favorites Tools Help

Work Order Tracking

Find Seed Action

Link Work Order Plans Related Records Actuals Safety Plan Log Failure Reporting Specifications

Make all body materials and debris be accounted for and removed from the work area? Check the box if answer YES?   
 Was the maintenance work or repair undertaken in a flood handling area? Check the box if answer NO?   
 Was the user notified to perform a comprehensive condition assessment before resuming production?

Work Order: 10178786 ROTARY SCREEN RI  
 Location: WW WATER  
 Asset: 101628  
 Parent W/O:  
 Coordinate:

Site: 001  
 Case: WORKORDER  
 Work Type: RI  
 Cl. Account:  
 Failure Code:  
 Problem Code:

Status: PFRD  
 Changed By: P3CJHR  
 Changed Date: 7/13/11 1:26 PM  
 Status Date: 7/13/11 7:26 AM

Interim Status Change?   
 Accepts Change?   
 In Test?   
 Under Plan Control?   
 Suspend Plan Control?   
 Plan Action:  
 Fee Action Asset?

Job Details: Job Plan: P01183 RI: 101628 Safety Plan: Contract:

Asset Location: Description: Target/Reschedule: No res to daily: Reschedule: Status: Site:

Scheduling Information: Target Start: 7/13/11 8:00 PM Actual Start: 7/13/11 7:26 AM Target Finish: 7/13/11 10:00 PM Actual Finish: Duration: 1:00 Time Remaining: Preprocessors: Originating Record: Originating Record Case: Has Follow-up Work? Interruptible?

Responsibility: Reported By: STAMADON Supervisor: OPEL Owner: Reported Date: 7/13/11 10:55 PM Crew:

Done

Start | Inbox - Micr... | Clay absorbe... | 3 new - Win... | Work Orde... | Thursday.do... | CONTROL R... | WW Operati... | Local Intranet | 100% | 1:32 PM

Inventory - Windows Internet Explorer

http://maxul.oceanspray.com/maximo/af/?event=loadapp&value=Inventory&businessid=213

File Edit View Favorites Tools Help

Inventory

Link Inventory Resorder Details Rotating Assets Volume Used

Site: 001 Item: 00125 CHEMICAL POLYMER, BLOODE PRESS HOOD  
 Stockroom: PRIMARY Tankman Store Room  
 On-hand: 0  
 Lot Type: BULLOT  
 Stock Category: CS  
 Max # of Item Number: 0277

Status: ACTIVE  
 Default Bin: 001  
 Capitalized: 0  
 KPI: 0  
 Comments:

Balance Summary: Current Balance (in Issue Units): 1,800.00 Qty. Currently Reserved: 0.00 Expired Quantity in Stock: 0.00 Qty. A-Alarm: 1,800.00 Qty. in Holding Location: 0.00 ABC Type: B Count Frequency: 300 Last Issue Date: 02/11/11 10:36 AM Year to Date: 2,500.00 Last Year: 11,310.24 1 Year Ago: 4,455.00 2 Year Ago: 8,244.32

Condition Code	Description	Condition Rate	Standard Cost	Average Cost	Last Revised Cost
		100	2.50	2.17	2.95

Bin	Lot	Condition Code	Current Balance	Physical Count	Physical Count Date	Revised	Shelf Life (Days)	Expiration Date
WW			1,800.00	0.00	01/06/11 0:52 AM			

Done

Start | Inbox - Micr... | Clay absorbe... | 3 new - Win... | Inventory -... | Thursday.do... | CONTROL R... | WW Operati... | Local Intranet | 100% | 1:43 PM

**Appendix A**

**Wastewater Treatment Plant Quality Assurance Manual**



**Wastewater Treatment Plant  
Quality Assurance  
Manual**

**Ocean Spray Cranberries, Inc.**

**Markham Facility**

**May 1, 1994**

**Updated June, 2023**

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## **1. Organization /Responsibilities**

The Ocean Spray Wastewater Treatment Plant (OSWWTP) is operated by the Group 2 Treatment Plant Operators (2TPO) and the Group 1 Treatment Plant Operator. The 2TPO are responsible for establishing quality assurance and quality control (QA/QC) policies and ensuring those policies are followed. The 2TPO are also the primary laboratory analysts and are responsible for performing analyses on wastewater and quality control samples and recording results. In the absence of, or under the direct supervision of the 2TPO, the Group 1 Treatment Plant Operator may also perform analyses on wastewater and QC samples and record results. The 2TPO will verify such results. The 2TPO are also the sample custodians.

## **2. Policy for Quality Assurance/Quality Control**

The principal objective for operating the OSWWTP laboratory is to consistently produce complete analytical data which accurately represents the waste stream from which that sample was taken.

All analytical procedures will be completed according to approved methods (see Section 4) to include all QE/QC measures required by those methods. The initial data quality objective (DQO, a target for precision and accuracy) for each method is to achieve better precision and accuracy levels than those cited for each method in "Standard Methods". Once control charts have been established for BOD and TSS (see Section 5. f.), the statistics used for the chart (i.e., the mean and standard deviation) become the DQO's for those tests, provided they are better than the initial DQO's.

No sample data will be recorded without including results for any analyses of QC samples associated with the data. Data will be entered in ink on printed sheets and kept in files both paper and electronic. Data will be kept for at least three years. All data will be reviewed and validated prior to release of the data from the OSWWTP laboratory.

Initial training for new operators on analytical methods and QA/QC requirements and procedures will be conducted on a priority basis. Additional training will be conducted periodically (not less frequently than twice per year) as required to maintain competence in analytical skills.

Located in the lab are copies of the OSWWTP discharge permit, "Standard Methods" applicable, EPA methods, this QA Manual, and, in a readily available binder, safety data sheets (MSDS) for all potentially hazardous chemicals used in the lab.

Training documentation of the operator staff is retained in their respective personnel files.

### **3. Sample Management**

Samples will be taken according to the schedule in Table 1 (Appendix B) which includes preservation techniques and maximum holding times. Daily samples, including collection of composite samples, will be taken between 0600 and 0700 and twice weekly samples on Wednesday and Friday mornings (same time) unless conditions (e.g., weather, plant operations, personnel availability) do not permit sampling at that time. In such cases, samples will be taken as soon as possible and a note made in the plant log justifying the delay.

The TPO, as sample custodian, assures, (1) samples are stored properly and handled by a minimum number of people, (2) the lab is secured at all times when not in use, (3) only authorized personnel are allowed in the lab, (4) samples are logged on permanent lab record, and (5) someone is appointed to analyze the sample.

Chain of custody for samples to be analyzed by outside laboratories is maintained by having the person who collects the sample put it into the shipping sample bottle, label the bottle and prepare it for shipment.

### **4. Methods**

Methods used in the OSWWTP lab are those prescribed in the 22th Edition of "Standard Methods for the Examination of Water and Wastewater" and Direct Reading Spectrophotometric tests using HACH equipment and pre-measured reagent pillows. Appendix D is a brief description of the methods used in OSWWTP lab.

### **5. Calibration and Quality Control Procedures**

#### **5.1 Lab Facility**

The lab is always kept clean and orderly. Specific facility issues are addressed in the checklist of Appendix C.

#### **5.2 Instrument Calibration.**

Instruments are calibrated just before use. Those requiring calibration are the pH meter and probe, and the DO meter. The DO meter is normally calibrated in air. Records of calibration are maintained on log sheets for each piece of equipment. Equipment calibration requirements are indicated in Table 2 (Appendix B).

### 5.3 Preparation of Calibration Curves.

No calibration curves are required in the OSWWTP lab. But they are tracked for the PH meter on the calibration log to ensure that no extreme variation enters the mean.

### 5.4 Equipment Maintenance

All lab equipment is maintained so as to keep it in proper working order at all times. Simple repairs may be made by lab personnel; qualified service representatives will perform more extensive repairs. Breakdowns and repair procedures will be noted in the log on each piece of equipment. Checks of the drying oven and BOD incubator temperatures are performed and recorded. The analytical balance is checked monthly or more often using standard weights and serviced by professional service representatives as required or, as a minimum, annually. A backup probe is kept on hand in case of probe failure. Records of all routine maintenance and repairs are kept in equipment logs. The sample refrigerator is maintained at a temperature between 1 and 4.4 degrees C.

### 5.5 Analytical Reagents

Only analytical grade reagents are used. Labels on all chemical reagents are marked with date received; dates opened, and, when known, date of expiration. Chemicals are stored out of direct sunlight. Those requiring cold storage are kept in the refrigerator, separate from sample storage. Acids and bases are stored separately in specially designated areas. Care is taken to prevent cross contamination of reagents and samples. Contaminated reagents and outdated chemical solutions are disposed of in accordance with accepted practices. For reagents mixed in the lab, shelf life recommendations provided in the analytical method are followed. Distilled water, produced in the lab using a still, is stored in glass carboys (water may be purchased when necessary). Care is taken to not contaminate distilled water, and water suspected of being contaminated is discarded. Standard solutions are stored separately and safeguarded to preclude inadvertent contamination.

### 5.6 Quality Control Analyses

Quality control measurements are made for all analyses related to "plant performance" samples (as indicated by "PP" in Table 1). It is very important that these tests be performed exactly as written in published methods. Routine analyses of blanks, duplicates, and standard solutions are performed according to the frequency shown in Table 2. Results of blank analyses are treated in the manner specified by the method. Data from results of duplicate analyses are treated in the manner specified in the following sections on evaluating accuracy. They are also

recorded on the plant sample bench sheets. QC considerations for specific tests follow.

*A. BOD.*

The DO probe is air calibrated each day during which analyses are normally run. Samples are incubated at 20 deg. C plus or minus 1 deg. as measured by a certified thermometer (i.e., one which has been checked against a National Institute of Standards and Technology --- NIST ---- thermometer). It is very important that initial DO be measured when the sample is at 20 deg. +/- 1 deg. C so initial and final DO are measured at the same temperature. Dilution water is kept in the incubator to make sure it is at 20 deg. C. If necessary, samples are warmed or cooled to bring them to the same temperature. A purchased ready-made standard of glucose and glutamic acid are run with each BOD using a settled primary seed. If the BOD of the check standard is outside the action range on the control chart, the source of the problem is sought, and corrected. Duplicates are run daily on final effluent samples. Duplicate results should be within 20% of each other. A blank is run on unseeded dilution water with each set of samples. Depletion (i.e., the DO drop) on the blank should not exceed 0.2 mg/l, and DO drop for samples should be at least 2 mg/l with a residual DO of at least 1 mg/l. If these targets are not met, corrective action is taken. (e.g., calibration, dilution water, and the nutrient solution are checked, and problems corrected). A performance evaluation (PE) sample is analyzed once every six months as part of the PT Provider Study. If results are not within acceptable limits, a QC sample is analyzed after identifying and correcting probable causes of error.

*B. Total Suspended Solids (TSS)*

The principal calibration in the TSS determination is on the analytical balance which is checked by lab personnel monthly using class "S" weights spanning the normal weight ranges used in the lab, and by a service representative annually. A blank is run on distilled water monthly. If TSS value for the blank varies by more than 0.2 milligrams from zero, corrective action should be taken. Duplicates are run daily on effluent samples. The duplicate values should be within 30% of each other. PT Provider PE samples are analyzed as in 5.6.A above.

*C. pH*

The manufacturer's instructions are followed for storage and preparation for use of the pH meter. Three buffer solutions are used to calibrate the meter. Since the pH meter has an automatic slope calibration with buffers of pH 4,7 and 10, the three buffers of pH 6, 7 and 10 are used for checks only after the new slope has been stored in the meter. The meter is checked just prior to use with pH 6, pH 7, and pH10 buffer solutions. Buffer solutions values should not vary by more than 0.1 pH unit. Performance evaluation samples are analyzed as in 5.6.A above.

*D. Nitrogen, Ammonia*

Nitrogen Ammonia standard solutions of 0.5 mg added to 25 mL of distilled water and 1 mg added to 25 mL of distilled water are checked monthly. The results are recorded in the lab's weekly BOD bench sheet. Results should fall within a standard deviation of  $\pm 0.020$  mg/L.

*E. Total Chlorine Residual*

Chlorine Standards of 0.1, 0.4 and 0.6 mg added to 25 mL of distilled water are checked monthly. The results are recorded in the lab's weekly BOD bench sheet. Results should fall within a standard deviation of  $\pm .07$  mg/L.

5.7 Data Management

All records mentioned in the preceding and subsequent paragraphs and required in standard methods are retained at the OSWWTP office in file cabinets and electronic for a period of at least three years. Before any result is reported, all raw data and calculations are reviewed for accuracy and signed by the 2TPO acting as the quality assurance officer. If data contained on any record is transcribed to facilitate brevity or neatness, the original record is also kept. All data is recorded in ink and corrections are initialed. A list of initials identifying the person to whom they belong is maintained as a permanent lab record.

5.8 Audits

Two types of audits are used to determine status of the OSWWTP lab operations. A System Audit is used to assess personnel, equipment, facilities, and analytical procedures. The system audit is conducted periodically by the Department of Ecology and at least every six months by the 2TPO. Performance Audits are conducted at least once every six months for each plant performance parameter except fecal coliforms. Our benchmark performance audits are sent to Analytical Standards, Inc. 6331 Emerson Avenue P. O. Box 4060 Parkersburg, West Virginia 26104-4060.

5.9 Reports

A QA/QC report is prepared by the TPO quarterly and given to the Facility's Environmental Engineer. The TPO may provide the report in writing (verbatim or in summary) or verbally to the Facility's Plant Manager. The checklist at Appendix C is used to assist in drafting these reports and otherwise in assessing lab capability and performance.

## APPENDIX A

### GLOSSARY OF QUALITY ASSURANCE/QUALITY CONTROL TERMS

**Accuracy** A Degree of agreement of an analytical result with the true value. Accuracy is affected by both random and systematic errors, but is sometimes used (improperly) to denote only systematic error. (See "bias".)

**Action limit** a type of control limit on a control chart which, if exceeded, required corrective action to be taken, Action limits are usually placed at +3 standard deviations from the expected or mean value.

**Batch** A set of consecutive determinations (analyses) made without interruption; a "run". Results are usually calculated from the same calibration curve or factor.

**Bias** The inaccuracy of an analytical result caused by systematic error.

**Blank** An analysis made identically to a sample but intended not to contain the determinant (analyze) (e.g., in water analyses, pure water would be analyzed to determine the blank.)

**Check Standard** A solution of known concentration which is used to check the precision of analyses (and bias due to calibration). When used in conjunction with a control chart, it becomes a control standard.

**Data Quality** Qualitative and quantitative statements of the quality of data objectives (DQOs) needed to support specific decisions or regulatory actions. Qualitative statements should address accuracy, completeness, representativeness, and defensibility as a minimum, and quantitative statements should address bias and precision.

**Precision** A qualitative term used to denote the scatter of results. Precision is said to improve as the scatter among results becomes smaller. Also referred to as imprecision. Usually measured as standard deviation or relative percent difference (RPD).

**Quality Assurance (QA)** The total integrated program for assuring the reliability of monitoring and measurement data.

**Quality Control (QC)** The routine application of statistically-based procedures to evaluate and control the accuracy of results from analytical measurements.

**Random errors** Errors occurring when repeated analyses of identical portions of a homogeneous sample do not give a series of identical results. The results differ among themselves and are more or less scattered about some value. They are

termed random because the sign and magnitude of the error of any particular result vary at random and cannot be predicted exactly.

**Relative standard deviation (RSD)** "coefficient of variation." It is calculated as either  $s/\bar{x}$  or  $100s/\bar{x}$ , where " $\bar{x}$ " is the mean result.  $100s/\bar{x}$  is sometimes referred to a percent relative standard deviation of %RSD.

**Standard** A solution of known concentration, either a "check" or "control" standard, or calibration standard which is used to prepare a calibration curve.

**Standard Operating Procedure (SOP)** A detailed, written description of a procedure designed to systematize performance of the procedure.

**Standard Deviation** A constant which describes the spread of results. An actual standard deviation is denoted by " $\sigma$ " whereas an estimate is denoted by " $s$ ". For a sample of " $n$ " replicate results taken from a population for analyses of a sample of known concentration, the estimate of the standard deviation is:

$$s = \sqrt{[\sum(x_i - \bar{X})^2 / (n-1)]} = \sqrt{[\sum x_i^2 - (\sum x_i)^2 / n] / (n-1)}$$

where " $x$ " is a result and " $\bar{X}$ " is the mean of " $n$ " results.

For duplicate analyses of " $m$ " pairs of unknown samples, the estimate of standard deviation of the difference ( $d$ ) for the two samples in each pair is:

$$s = \sqrt{[(\sum d^2 - (\sum d)^2 / m) / (m-1)]}$$

**Systematic errors** Errors which are indicated by attendance of results to consistently be greater or smaller than the true value. Usually, bias can be considered to be equivalent to systematic error.

**Warning Limit** A type of control limit which is specified by a value on a control chart, usually  $+2s$  distant from the expected or mean value. Action is required when results fall outside the warning limits too frequently. A single value outside a warning limit does not require action, but should alert one to a possible problem. Three consecutive results outside a warning limit should be cause for action.

**APPENDIX B**

**TABLES**

Table 1: Sampling Summary

Table 2: Quality Control Procedures Frequency Chart

**Table 1**

Unit Process	Sampling Location	Analysis	Use	Freq.	Type	STD. METH (ED.20)	Preservation	Holding Time	Container Specs.
Mixed Liquor	Clarifier Feed Pipe	COD	PC	W	G	5220 D	None Required	8 hours	G,P
		Temp	PC	C	N/A	2550	None Required	N/A	N/A
		TSS	PC	W	G	2540 D	Cool, 4deg C	7 days	P,G
		NO <sub>3</sub>	PC	W	G	EPA350.1_2_1993	Cool, 4deg C H <sub>2</sub> SO <sub>4</sub> to pH<2	48 hours	P,G
		pH	PP	D	G	4500-H	None Required	Stat.	P,G
		Ammonia	PC	W	G	EPA350.1	Cool, 4deg C	24 hours	P,G
Processed Effluent	Clarifier Weir Converger	TSS	PP	W	C	2540 D	Cool, 4deg C	7 days	P,G
		Zinc	PP	M	G	200.7	None Required	7 days	P,G
		COD	PC	D	G	5220 D	None Required	8 hours	P,G
		Ammonia	PP	W	C	EPA350.1_2_1993	Cool, 4deg C	24 hours	P,G
		BOD	PP	W	C	5210 B	Cool, 4deg C	6 hours	P,G
		TSS	PP	W	C	25400	Cool, 4deg C	7 days	P,G
		F Col.	PP	1W	G	9222D	Cool, 4deg C 0.008% NA <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	24 hours	P,G
Final Effluent	P2	Cl <sub>2</sub> Res.	PC	D	G	4500 Cl G	None Required	Stat.	P,G
	Combined Effluent	Cl <sub>2</sub> Res.	PP	D	G	4500 Cl G	None Required	Stat.	P,G
		pH	PP	D	G	4500-H	None Required	Stat.	P,G

Unless otherwise indicated:

**Analysis**  
 Cl<sub>2</sub> Res. = Chlorine residual  
 F Col =Fecal Coliforms  
 NO<sub>3</sub> = Nitrate Nitrogen  
 Temp = Temperature  
 TSS + Total Suspended Solids  
 Zinc = Zinc  
 Ammonia = Ammonia  
 COD = Chemical Oxygen Demand

**Use**  
 PP = Plant Performance  
 PC = Process Control

**Container Requirements**  
 G = Glass  
 P = Plastic

**Type**  
 G = Grab  
 C = Composite

**Frequency**  
 1W = Once per Week  
 W = Two per Week  
 D = Once per work day (Mon-Fri)  
 M = Monthly  
 C = Continuous

**Table 2**  
**QUALITY CONTROL PROCEDURES FREQUENCY CHART**

<b>Parameter</b>	<b>Calibration</b>	<b>Check Standards</b>	<b>Blanks</b>	<b>Duplicates</b>	<b>PE Samples</b>
DO (for BOD procedure)	N/A for Winkler titration. If using DO probe, air calibrate each day.	N/A	each test day	each test day	1 Each 6 month
TSS	Balance check each month & each year by service representative.		1 Each month	each test day	1 Each 6 month
pH	Daily	each test day	N/A		1 Each 6 month
Chlorine residual	N/A	1 per month	N/A		1 Each 6 month
Fecal Coliforms	N/A sample is sent to Grays Harbor county lab	N/A	N/A	N/A	N/A
Ammonia	N/A	1 per month	N/A		1 Each 6 month

**APPENDIX C**

**WWTP LABORATORY QUALITY ASSURANCE CHECKLIST**

COMMENTS: YES NO

**GENERAL**

Is the Quality Assurance Manual up-to-date, available to all lab personnel?  
\_\_\_\_\_

**LABORATORY PROCEDURES**

1. Are EPA-approved methods (e.g., Standard Methods) used and readily available to and used by all lab personnel? \_\_\_\_\_
2. Is calibration and maintenance of instruments/equipment satisfactory?  
\_\_\_\_\_
3. Does a written schedule for required equipment maintenance exist? \_\_\_\_\_
4. Are QC procedures in the QA manual used consistently? \_\_\_\_\_
5. Are QC records adequate to determine if lab is in control? \_\_\_\_\_
6. Are instruments appropriate for the method and in good condition? \_\_\_\_\_
7. Are trouble shooting procedures and written requirements for daily operation of instruments available to each instrument operator? \_\_\_\_\_
8. Are standards available to perform required QC checks? \_\_\_\_\_
9. Is proper volumetric glassware used? \_\_\_\_\_
10. Is glassware properly cleaned? \_\_\_\_\_
11. Are solvents and standard reagents properly stored? \_\_\_\_\_
12. Are calibration and check standards frequently cross-checked? \_\_\_\_\_
13. Are standards discarded after recommended shelf-life has expired? \_\_\_\_\_
14. Are reagent bottles marked with date received, opened, and (when known), with expiration date? \_\_\_\_\_
15. Are blanks run each day for appropriate analyses (e.g., BOD, TSS< chlorine residual)? \_\_\_\_\_

16. Are sufficient SOPs on hand for lab operations (e.g., cleanup, hazard response)? \_\_\_\_\_

### **LABORATORY'S PRECISION, ACCURACY & CONTROL PROCEDURES**

1. Are duplicates analyzed for all analyses and results recorded? \_\_\_\_\_
2. Are control samples required by the QA Manual introduced into the train of actual samples to ensure valid data are being generated? \_\_\_\_\_
3. Are control charts maintained and used routinely? \_\_\_\_\_
4. Is the lab within control (i.e., is precision good)? \_\_\_\_\_

### **DATA HANDLING AND REPORTING**

1. Are round-off rules documented and uniformly applied? \_\_\_\_\_
2. Are significant figures established for each analytical procedure? \_\_\_\_\_
3. Are results checked by at least one person other than the analyst? \_\_\_\_\_
4. Are correct formulas used to calculate final results? \_\_\_\_\_
5. Do report forms exist to provide complete data documentation and permanent recorded and to facilitate data processing? \_\_\_\_\_
6. Are data reported in proper form and units? \_\_\_\_\_
7. Are lab records maintained for a three-year period? \_\_\_\_\_
8. Is all data recorded in ink with corrections initialed? \_\_\_\_\_
9. Is a list of initials identifying to whom they belong filed in the lab? \_\_\_\_\_
10. Are lab notebooks and pre-printed data forms bound permanently to provide good and defensible documentation? \_\_\_\_\_
11. Does an efficient filing system exist? \_\_\_\_\_

**LABORATORY PERSONNEL**

1. Are enough analysts present to perform necessary analyses? \_\_\_\_\_
2. Do analysts have on-hand necessary references for procedures being used?  
\_\_\_\_\_
3. Are analysts trained in procedures performed? \_\_\_\_\_

## APPENDIX D

### SUMMARY OF ANALYTICAL METHODS

#### 1. pH (SM #4500-H B)

pH is the numerical call of the acidity or basicity of the tested solution. A value of 7.0 indicates the solution is neutral. Values less than 7.0 are acidic; greater than 7.0 are basic. Sudden changes in pH values may be the result of illegal discharges of acid or base into the wastewater system. Extreme shifts in pH may cause damage to the treatment facility and/or the biological treatment process.

This lab uses the electrometric method of pH measurements. A Hach sensION4 pH meter is used. The manufacturer's instructions are followed closely on use of the pH meter and on storage and preparation for use of the electrodes. Electrodes are kept wet by returning them to the storage solution whenever the pH meter is not being used. To prepare the electrodes for use, remove them from the storage solution, rinse with distilled water, and gently blot them dry with soft tissue then snap it sharply to remove and excess liquid on the probe. Bring both the sample and buffer solutions to room temperature

Calibrate the pH meter by using the PH calibration method listed in the Hach sensION4 manual. If the meter reads more than 0.1 pH units from the value expected for the buffers, look for trouble with the electrodes or potentiometer. Repeat this calibration procedure for every batch of pH analyses. Because samples normally analyzed in the OSWWTP lab are slightly acidic, calibration buffers maintained are pH 4.0,7.0 and 10.0 produced from HACH powder pillows.

When reading pH of the sample, establish equilibrium between the electrodes and the sample by stirring the sample to ensure homogeneity. Values are reported to the nearest 0.1 pH units. Typical intra-laboratory tests result in standard deviations of +,- 0.1 to +,- 0.2 pH units over the pH range.

#### 2. Chlorine Residual Hach Spectro-Photometer (SM #4500-Cl G)

Chlorine is added to water to destroy or deactivate disease-producing microorganisms. Residual chlorine may be present in waters reaching the wastewater treatment plant. Since chlorine is not stable in water solutions, its concentration in samples decreases rapidly. Exposure to sunlight or other strong light, or agitation reduces the quantity of chlorine in solutions. Samples to be analyzed for chlorine residual must be analyzed immediately after sampling.

OSWWTP uses Hach DPD Total Chlorine Method with a DR-2800 Spectrophotometer. This method is the same as Standard Methods #4500-Cl G.

### **3. Total Suspended Solids (SM #2540 D)**

The measurement of suspended solids, or suspended matter, in wastewater at various stages in the treatment gives a good indication of the efficiency of treatment. Total suspended solids may be determined by filtering a sample through a glass fiber filter and drying the residue to constant weight at 103-105 deg. C. A 934AH filter pad is used.

This lab uses a Gooch filter apparatus attached to a change vacuum pump. Other apparatus used in the determination include a drying oven, an analytical balance, and a desiccator. The glass fiber disk are first dried at 103 - 105 deg. C for an hour, cooled in a desiccator to room temperature, and weighed. The sample (100, 50, 25, or 10 milliliters, depending on expected suspended matter content, which should be at least one, but preferably between 2.5 and 200, milligrams) is filtered through the glass fiber disk, and the disks are again dried, desiccated, and weighed. Difference in the two weights is the amount of suspended solids in the sample.

From a standpoint of quality control, the analytical balance is the most important instrument although care must be taken to assure the drying oven is actually operating at 103-5 degree C, and that the desiccator is free from moisture (i.e., silica gel is replaced as required.) The total suspended solids test is a relatively imprecise procedure with the percent relative standard deviation reaching 33% for some concentrations.

\* Percent relative standard deviation (%RSD) is the same as coefficient of variation.  
 $\%RSD = 100 \times \text{standard deviation} / \text{mean}$ .

### **4. Biological Oxygen Demand (SM # 5210 B)**

This test measures the amount of organic material in a sample by measuring the oxygen consumed by microorganisms in biodegrading organic constituents in the sample. BOD is an important measure of the quality of discharged water as high BOD can result in undesirable effects on receiving waters. DO is measured using an HACH Luminescent Dissolved Oxygen meter.

Samples analyzed in this lab generally are in the 6.5 to 7.5 pH range, normally have not been chlorinated or oxidized by ozone, have not been biologically treated, are not extremely hot or cold, do not contain toxic, and do not contain supersaturated dissolved oxygen. Therefore, OSWWTP samples normally do not require any special pretreatment as described in standard methods. When residual chlorine is present, as it sometimes is, the dechlorination procedure in Standard Method 22<sup>nd</sup> Edition, Method #5210 B is followed prior to BOD analysis.

A COD test is run on the effluent sample to determine if, the sample must be diluted. Amount of sample added to a 300-mL bottle is determined from charts posted on the BOD incubator.

### BOD DILUTION CHART

COD RESULTS	ml OF EFFLUENTS		% DILUTION	
25	225	300	75	100
30	150	225	50	75
36	75	150	258	50
50	60	120	20	40
73	40	80	13.3	26.7
81	30	60	10	20
118	24	48	8	16
123	18	36	6	12
147	18	36	6	12
181	18	36	6	12
232	12	24	4	8
257	12	24	4	8
259	9	18	3	6
280	9	18	3	6
321	9	18	3	6
366	9	18	3	6

Tests are done in duplicate, and each test includes a DO determination on a bottle containing only dilution water. DO is measured at the beginning of the test and after a 5-day incubation period. Incubation is in the dark at 20 +/- 1 degree C (as measured with a certified thermometer). During periods when BOD may vary widely, it is advisable to prepare an additional set of diluted bottles, the second set containing double the amount of sample as determined from the dilution chart. This is to assure there will be some DO to measure at the end of the incubation period.

In typical intra-laboratory tests of natural water samples plus an exact increment of biodegradable organic compounds, mean values of 2.1 and 175 mg/L BOD with respective

standard deviations of + 0.7 and + 26 mg/L (coefficients of variation of 33% and 15%) were obtained.

#### **5. Ammonia N ( EPA Method 350.1)**

This test measures the concentration of residual ammonia remaining in the process effluent from the nutrient additions of urea and to the mixed liquor. This measure is important for process control to reduce operational costs by adding nutrients only as needed for the bacterial growth in the mixed liquor. Ammonia is also a significant pollutant to water bodies as it is toxic as ammonia and is a nutrient causing dissolved oxygen depletion as it is reduced.

This test is performed daily on refrigerated, 24-hour composite sample and grab samples of process effluent. The sample is filtered and analyzed on a Hach DR2800 utilizing the procedures described in the Lab Procedures Manual.

#### **6. Nitrate (NO<sub>3</sub>)**

This test measures the concentration of residual Nitrate (NO<sub>3</sub>) remaining in the process effluent from the nutrient additions of urea to the mixed liquor. This measure is important for process control to reduce operational costs by adding nutrients only as needed for the bacterial growth in the mixed liquor. Nitrate (NO<sub>3</sub>) is also a significant pollutant to water bodies causing dissolved oxygen depletion.

This test is performed daily on refrigerated, 24-hour composite sample and grab samples of process effluent and mixed liquor. The sample is filtered and analyzed on a Hach DR2800 utilizing the procedures described in the Lab Procedures Manual.

#### **7. Phosphorus**

This test measures the concentration of residual Total Phosphorus remaining in the process effluent from the additions of phosphoric acid to the mixed liquor. This measure is important for process control to reduce operational costs by adding nutrients only as needed for the bacterial growth in the mixed liquor. Phosphorus is also a significant pollutant to water bodies it can trigger a significant algal boom causing dissolved oxygen depletion as it is reduced.

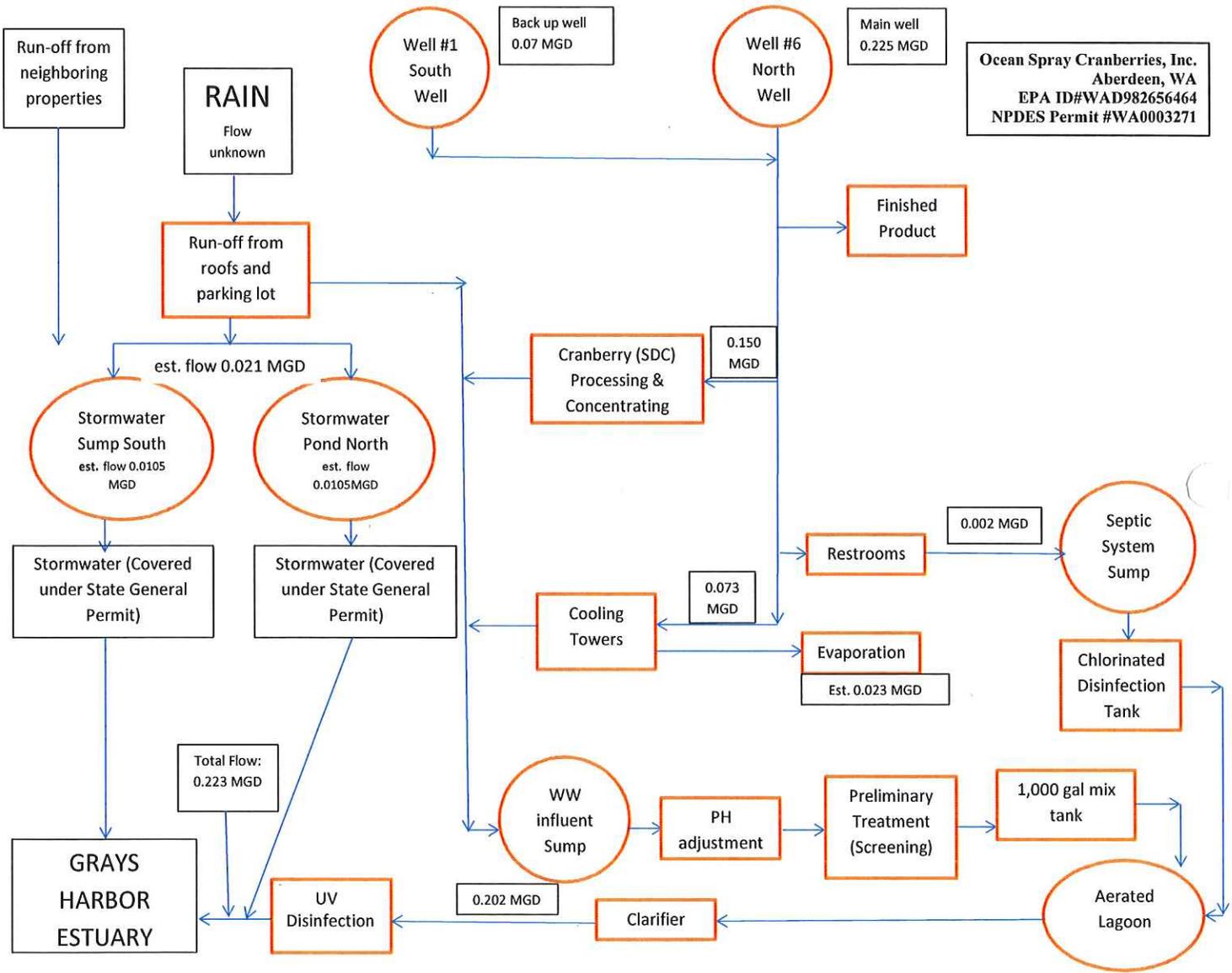
This test is performed daily on refrigerated, 24-hour composite sample and grab samples of process effluent. The sample is filtered and analyzed on a Hach DR2800 utilizing the procedures described in the Lab Procedures Manual.

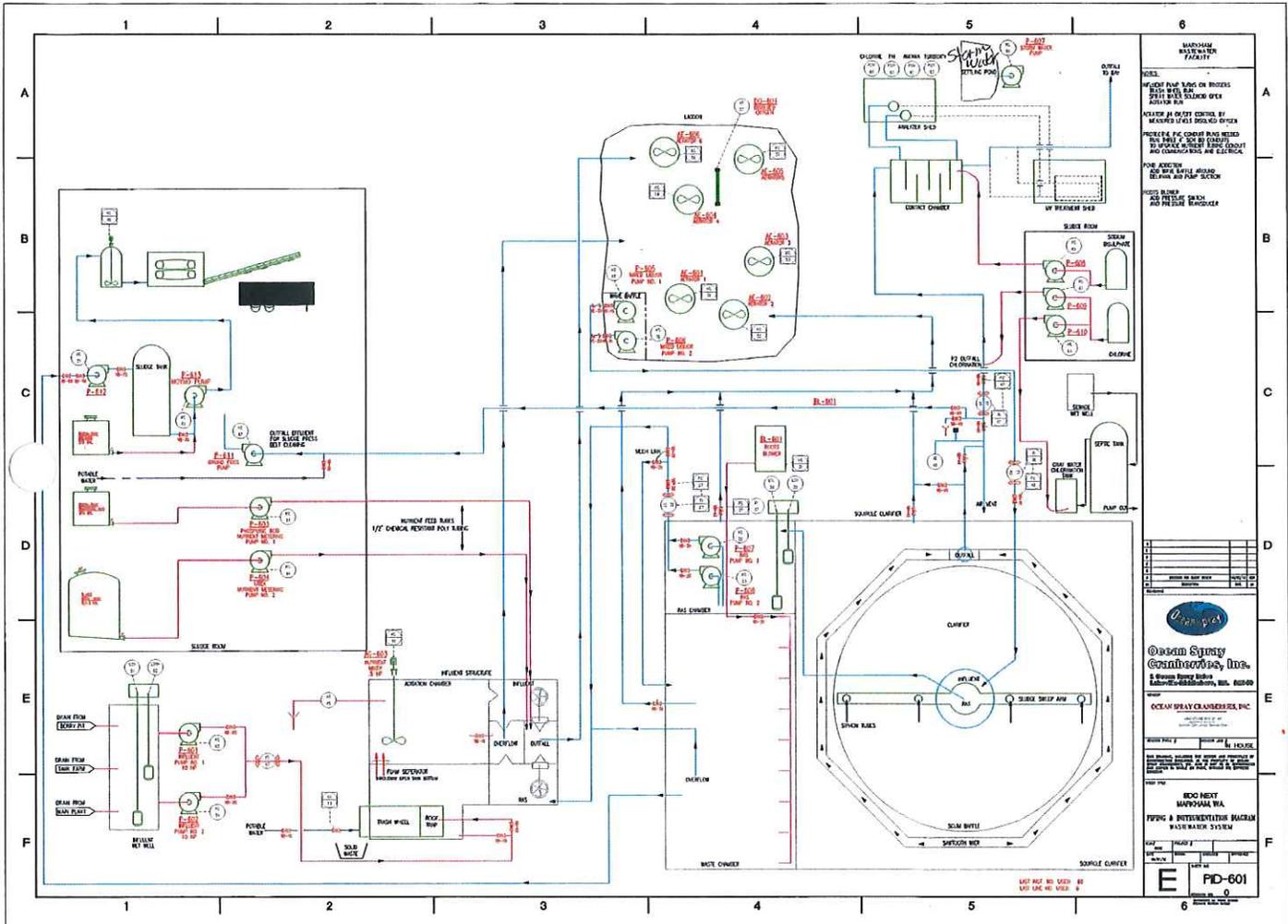
#### **8. Fecal Coliforms**

The Plant WWTP sends fecal coliform samples to the state lab weekly.

**Appendix B**

**Drawings**





**Appendix C**

**Responsible Personnel**

**Appendix C****Responsible Personnel**

<b>Name</b>	<b>Title</b>	<b>Phone Number</b>	<b>Certification</b>
Mark Polito (interim)	Interim Plant Manager	508-441-2110	
Trevor Williams	Operations Manager	360-589-4384	
Cristian Dumitrescu	EHS Manager	360-648-2541	
Lindsey Nelson	Operations Supervisor	360-648-2201	Group 2
Troy Gillespie	WW operator	360-648-2520	Group 2
Kristi Melinkovich	WW operator/parts person	360-648-2520	Group 1
Vacant	WW operator/parts person	360-648-2520	

**Appendix D**

**Solid Waste Control Plan**

**SOLID WASTE CONTROL PLAN**

**Ocean Spray Cranberries, Inc.**

**Aberdeen, WA**

**May, 2023**



**Ocean Spray Cranberries, Inc.**

1480 State Route 105

Aberdeen, WA 98520

Tel: (360) 648-2541

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## 1.0 Description

This solid waste control plan is designed to identify the solid waste streams from the Ocean Spray Cranberries, Inc. (OSC) facility in Markham, Washington and to describe the source, generation rate and final disposition of those wastes. A site map is enclosed to help identify the locations of the areas referenced.

## 2.0 Source/Content

Solid wastes are produced from OSC's facility in several forms: Wastewater Treatment biosolids (sludge) and screenings, fruit wastes, recycled materials and general rubbish.

### 2.1 *Wastewater Treatment Wastes*

Solid wastes are produced from OSC's wastewater treatment plant (WWTP) in three locations: pre-screening, solids/sludge dewatering, and the sanitary waste septic tank.

Raw process wastewaters flow by gravity to a grit removal system, then to a horizontal rotary screen for coarse solids removal for pre-screening prior to treatment in the primary lagoon. This pre-screened plant waste is primarily composed of cranberries, cranberry skins, leaves and stems. Collected solids are deposited into a waste bin. The bin which collects the screenings is checked frequently, and emptied at least once per week as described in Section 4.1. The bin is rinsed and cleaned as necessary, to prevent the occurrence of nuisance odors.

Following waste treatment by aerobic digestion in the primary lagoon and settlement within the clarifier, dewatered biosolids are produced by pumping the solids (sludge) that settle in the clarifier to a holding tank, and then to a dewatering belt press. This system uses a polymer to condition the sludge prior to feeding the belt press. The dewatered sludge is then conveyed via a screw conveyor into a storage/transfer trailer. The trailer is removed from the loading dock by a contracted disposal driver as described in Section 4.1.

A sanitary waste septic tank is located behind the clarifier and receives sanitary waste from the facility restrooms, as well as gray water from sinks within the plant. The tank has a capacity of 8,070 gallons. Solids are captured in the tank, while the clarified water is chlorinated prior to discharge to the aerated lagoon. Solids are pumped out of the septic tank and disposed at a licensed receiving facility by a licensed septic hauler every 6 months.

## 2.2 *Fruit Wastes*

Sweetened and dried cranberries (SDC) production yields a waste stream of raw whole cranberries and processed SDC's, which do not meet quality criteria.

## 2.3 *Recycled Materials*

Recycle material includes cardboard, paper, metal and general mixed recyclables. The materials are baled or stored in 20 yard roll-offs and sent to off-site recycling collection centers by a licensed contractor monthly.

## 2.4 *General Rubbish*

The general rubbish produced at OSC's facility contains non-recyclable items such as kitchen wastes and various packaging materials.

## 3.0 Generation Rate

- Wastewater Treatment Waste is generated at a rate of approximately 1,500 tons per year.
- Fruit Waste sent for land application is generated at a rate of approximately 2,500 tons per year.
- Recycled Materials is generated at a rate of approximately 200,000 tons per year.

## 4.0 Disposal Method

### 4.1 *Wastewater Treatment Wastes*

The solids that are separated in the pre-screening operation are put into a trash dumpster that is hauled by a permitted company, Brehmeyer Farms (formerly Skookum Farms), and is land applied as soil augmentation. Brehmeyer Farms is a county-permitted land application and composting company.

The dewatered biosolids/sludge are conveyed from the belt press to an open topped trailer located, under cover, on the east side of the primary lagoon. This trailer can hold approximately 14,000 pounds of sludge. When the trailer is full, it is hauled off-site and utilized by Brehmeyer Farms.

Stangland's Septic Service hauls the septic tank's sanitary waste solids to disposal at a municipal treatment center.

## 4.2 Fruit Wastes

The SDC waste is placed in a compost container and removed by Brehmeyer Farms.

## 4.3 Recycled Materials and General Rubbish

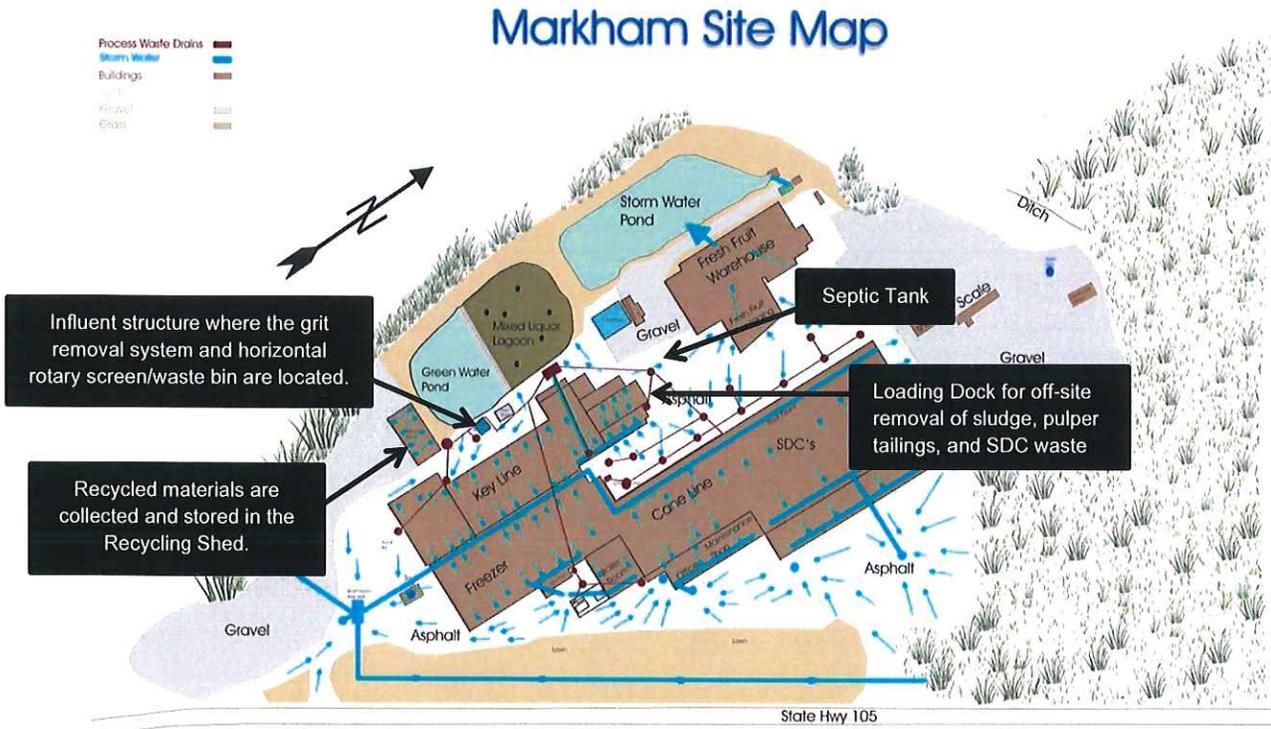
Cardboard is collected and baled at OSC's facility. Metal is collected in a 20 yard roll-off. All recyclables are transported off the property by LeMay, Inc., a licensed solid waste and recyclable material hauler.

Wood pallets are reused and are taken off the property by local shipping companies. Broken pallets are placed in a wood-only bin and removed with the general rubbish by Lemay, Inc.

General rubbish is also removed by LeMay, Inc.

## 5.0 Leachate Control

Stormwater catch basins surrounding all exterior solid waste storage containers drain to the on-site wastewater treatment system to protect from environmental discharge.



**Appendix E**

**Emergency Action Plan**

NPDES PERMIT #WA 0003271

# EMERGENCY ACTION PLAN



Ocean Spray Cranberries, Inc.  
1480 WA Route 105  
ABERDEEN, WASHINGTON 98520

*EMERGENCY RESPONSE PLAN  
AMMONIA REFRIGERATION ERP  
BUSINESS CONTINUITY PLAN  
PANDEMIC PREPAREDNESS PLAN  
XNG EMERGENCY RESPONSE PLAN*

MAY 2022

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## **4. PANDEMIC PREPAREDNESS PLAN FOR MARKHAM SITE**

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APPENDIX E – XNG CONTACT LIST

APPENDIX F – PLACEHOLDER (NOT USED)

APPENDIX G – CNG TRANSFER PROCEDURE

# EMERGENCY RESPONSE PLAN



Ocean Spray Cranberries, Inc.  
1480 WA Route 105  
ABERDEEN, WASHINGTON 98520

*May, 2022*

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12. FIRE PREVENTION PLAN

## 1. Purpose

This Emergency Response Plan (ERP) has been prepared as a comprehensive document for use in the management of emergency situations that may affect the Ocean Spray Cranberries, Inc., facility located at 1480 WA-105, Aberdeen, Washington. It has been drafted to be consistent with Corporate Policies EHS 5-04 (Reporting of Significant EHS Events to Corporate) and EHS 2-03 (Emergency Action Plan (EAP) and Emergency Response Plan (ERP) Policy).

This plan specifically addresses the guidance for response actions to be taken if any of the events referenced below were to occur at the site:

- Fire
- Flood
- Earthquake
- Tsunami
- High Winds
- Tornado/Water Spout
- Winter Storm/Ice
- Chemical Release/Spill (anhydrous ammonia, propane, diesel fuel, CIP, etc.)
- Explosion
- Medical Emergency
- Security Breach
- Power Outage
- Civil Disturbance
- Bomb Threat
- Salvation & Restoration
- News Media

The Emergency Response Plan (ERP) establishes the procedures and organizational structure for responding to emergencies that may occur at Ocean Spray Cranberries, Inc. - Markham. All employees are trained on the purpose of the ERP and the policies and procedures to follow during an emergency. The ERP addresses preferred means of reporting fires or other emergencies, types of evacuations used in various situations and the alarm system notification, first aid, and emergency medical treatment, procedures to account for all employees, coordination with the community, emergency notification and reporting as well as provisions for updating the Plan as policies, practices and other circumstances may dictate. In addition, employees who are members of the site emergency response team will receive training relating to their specific duties and assignments.

The ERP is a critical component of the facility's overall Risk Management Program. It has as its **priorities** the following elements:

- Saving lives and eliminating or minimizing injuries;
- The minimization of environmental impacts;
- The minimization of property damage;
- The minimization of business interruption;
- The minimization of product quality impact.

In implementing the ERP, the plant's specific objectives in priority order are as follows:

- Inform plant personnel and local and state authorities of the incident;
- Evacuate plant personnel if necessary to a safe location, and account for all individuals;
- Administer first aid to any individuals requiring such assistance;
- Stop or contain the fire or chemical release if feasible and as allowable under plant policy;
- Assist local and state authorities, to the extent practicable, in the ultimate containment of the fire/leak and the subsequent clean-up;
- Help ensure that no person will intentionally expose himself/herself to an unsafe condition or at-risk situation;
- Ensure safety and quality of our products.

## 2. Definitions

<b>TABLE 2-1 DEFINITIONS, EMERGENCY RESPONSE TEAM ROLES &amp; RESPONSIBILITIES</b>	
Area Coordinator (AC)	The Area Coordinator (AC) is responsible for assuring that all personnel have evacuated the emergency area; will take roll call at the assembly area and report to the Emergency Coordinator (EC); assist with emergency response operations as directed by the EC. <b>Plant Team Coordinators are generally designated as AC's.</b>
Emergency	Any abnormal situation, condition or upset requiring rapid attention and support by trained personnel from outside the immediate work area in order to avoid or mitigate a real or threatened danger.
Emergency Coordinator (EC)	The EC has the responsibility for coordinating all emergency response measures. The EC must be thoroughly familiar with all aspects of the facility's response plan, all operations and activities at the facility, the location and characteristics of waste handled, the location of all records within the facility, and the facility layout. <b>Plant Managers or Supervisors are generally designated as EC's.</b>
Emergency Response Situation	The event of a <b>spill</b> involving the <b>release</b> of a type or quantity of a chemical that poses an <b>immediate</b> risk to the health and safety of human beings, animals, fish, etc., and/or the environment (land, sea, and air).
Emergency Response Team (ERT)	A specialized team of employees who have been trained to respond to emergency situations; provide response actions for medical emergencies, fire emergencies, and chemical spills.
Hazardous Waste Accumulation Areas	Any area designated by the EHS Manager for the accumulation of hazardous wastes. These include <u>authorized</u> Satellite Accumulation Areas (SAA) in the workplace, and the 180-day Central Accumulation Area (CAA) in the Waste Building.

Hazardous Waste Coordinator	A qualified employee (generally a Waste Water Operator Technician) who is designated to provide technical support for assessment of, and response to emergencies that involve hazardous wastes.
Incidental Release or Spill	A release of a hazardous substance which does not pose a significant safety or health hazard to employees in the immediate vicinity. Incidental releases are limited in quantity, exposure potential, or toxicity. An incidental spill is not considered an emergency that requires activation of the ERP.
Communications Officer	The Plant Director is responsible for coordinating communications and information flow among the Emergency Coordinator, the Media, various responders and stakeholders.
Safety Officer	A resource, designated by the Emergency Coordinator, responsible for ensuring response operations are conducted safely and within established safety standards. The Safety Officer has the authority to terminate, suspend or modify any unsafe operation or action.

### 3. Emergency Response Organization

This section outlines the responsibilities of the facility's emergency response personnel and other employees. Upon activation of the Plan, the *Emergency Coordinator* has the authority to utilize all required personnel and resources that are necessary to effectively manage the emergency. The facility has designated *Emergency Coordinators (EC)* and *Area Coordinators (AC)* who are responsible to ensure that all personnel have evacuated their areas if required by an emergency. The Emergency Coordinator and Area Coordinator personnel are responsible for taking role call at the Assembly Areas. A more detailed discussion of the roles and responsibilities of these response personnel is contained on the following pages along with the names of current assignees.

#### 3.1 Crisis Management Team Responsibilities

##### 3.1.1 Emergency Coordinator

- Maintain an effective Emergency Response Program;
- Manage the facility's response to an emergency condition;
- Assess the level of risk an emergency poses to persons, the facility and the environment;
- Make notifications to outside emergency response agencies and regulatory agencies as necessary;
- Know the physical layout of the building(s) and location of emergency equipment;
- Generate the response action needed to abate or control the emergency;
- Direct evacuation procedures as determined by the emergency condition;
- Direct evacuated employees from the assembly areas to sheltered areas if weather or the emergency necessitates;

- Assign individual to keep unauthorized personnel out of a specific area;
- Determine when the facility can return to normal functions;
- Assure the initial and refresher training needed by response personnel;
- Conduct periodic emergency response drills;
- Advise senior management of developments and activities affecting the site

### 3.1.2 EHS Manager

- Serves as the Emergency Coordinator (if onsite).
- Nominates and provides training for the crisis management team
- Provides oversight, training and annual updates to the Emergency Response Plan including the preparation and maintenance of a current crisis alert contact list.
- Provides training (including new hire orientation and annual refresher) in safe evacuation procedures. This training includes; what to do in case of an alarm sounding, or other means of emergency communication, use of site maps, which clearly show the emergency escape routes and emergency equipment (i.e. fire extinguishers, first aid kits, AED's, BBP kits, safety shower and eyewash stations, exit doors, etc.).
- Conducts drills as necessary to familiarize employees with emergency procedures and to determine the effectiveness of each procedure. This involves tabletop drills, as well as emergency response scenarios.
- Keeps key emergency telephone numbers in an accessible location for immediate use and issued to key plant personnel to be retained in their homes, or cars for use in communicating an emergency occurring during non-operating hours.

### 3.1.3 Quality Manager

- Ensure product safety and quality, including recalls;
- Report of customer harm from product;
- Reports of tampering of finished product;
- Reports of contamination or other supply issues of raw ingredients in the supply chain.

### 3.1.4 Supervisors

- Serve as Emergency Coordinator if the EHS Manager, or Alternate Emergency Coordinators are not onsite.
- Take the visitor/contractor sign-in books (located in the main lobby) to the Assembly Area for an accurate head count.
- Direct all employees in an emergency, and perform head count, once all employees have exited the building and gathered at the designated Assembly Area.
- Sweep the building as needed to ensure all employees have exited the building.

### 3.1.5 Team Coordinators

- Serve as the Area Coordinator if the Supervisor becomes the Emergency Coordinator.
- Sweep specific work cells before exiting the building.
- Assist Emergency Coordinator with head count.

### 3.1.6 Site Emergency Response Team

- Employees that have the responsibility to protect company employees and company assets to the extent they have been trained. This includes first response actions for **medical emergencies, fire emergencies and chemical spills.**
- Response actions for medical emergencies include reporting the medical emergency and, if trained in First-Aid, CPR, AED, and Bloodborne Pathogens for First Responders, provide appropriate first-aid assistance to the individual with the medical emergency. The training and certification will be given by a recognized organization (i.e. American Red Cross, American Heart Association, etc.).
- Response actions for fire emergencies include:
  - Reporting the fire to the **fire department (dial 911).**
  - Reporting the fire to the **Emergency Coordinator.**
  - If trained in the use of a fire extinguisher, using a fire extinguisher to contain or extinguish the fire.
- Response actions for chemical spills:
  - Stopping the spill, if possible.
  - Reporting the spill to the Emergency Coordinator or Supervisor.
  - Keeping others away from the spill.
- Response actions for chemical releases:
  - Stopping the chemical, if possible by activating the emergency shutoff.
  - Reporting the chemical release to the Emergency Coordinator or Supervisor.
  - If required, evacuate the building.

### 3.1.7 Maintenance

- When alerted to an alarm event (i.e. supervisory, etc.), the maintenance representative will report to the control panel located in the main lobby. After reviewing the control panel display, the maintenance representative will then proceed to the trouble point to verify the alarm event.

### 3.1.8 Fire Pump Operator

- When instructed by the Emergency Coordinator, the Fire Pump Operator will report to fire pump house to ensure the fire pump is operating.
- Be familiar with fire pump house operations and know how to start and stop the fire pump.
- Have access to the fire pump house and PIV controls.

- Know which PIV (Post Indicator Valve) controls which sprinkler riser in the plant.
- When instructed by the Emergency Coordinator, unlock and place the PIV in the "CLOSED" position.

**3.1.9 Employees**

- Must know how to report emergencies, evacuate to the appropriate assembly area depending on nature of emergency (i.e. fire, severe weather, etc.), and understand and follow directions included in the plan.

**3.2 Listings of Internal Emergency Response Personnel**

Tables 3-1 and 3-2 list the Site Emergency Coordinators and Alternates, respectively. Table 3-3 lists the members of the Site Emergency Response Team.

For further information or explanation of this document, please contact any of the persons listed in tables 3-1 or 3-2.

TABLE 3-1 SITE EMERGENCY COORDINATORS		
Name	Title	Contact Info
Brett Insland	Plant Manager	Office: 360-648-2513 Cell: 903-335-0929 Home: 469-651-7142
*⊖ Cristian Dumitrescu	EHS Manager	Office: 360-648-2541 Cell: 360-589-0222 Home: 360-589-0222
Trevor Williams	Operations Manager	Office: 360-648-2558 Cell: 360-589-4384 Home:
Richard Church	Maintenance Manager	Office: 360-648-2589 Cell: 360-591-1586 Home:
	Associate PE Manager	Office: Cell: Home:
Sarah Meehan	Quality Manager	Office: 360-648-2533 Cell: 360-310-3655 Home:

**\* TO BE CONTACTED FOR ALL SPILLS / RELEASES OR FIRES IN ADDITION TO THE PLANT DIRECTOR**

**⊖ To be contacted for more information about this plan**

<b>TABLE 3-2 ALTERNATE EMERGENCY COORDINATORS</b>		
Name	Title	Contact Info
Grant Forrest	Supervisor	Cell: 360-581-5538 Office: 360-648-2553
Scott McFate	Supervisor	Cell: 360-591-2443 Office: 360-648-2553
Carla Jacobson	Supervisor	Cell: 360-581-4441 Office: 360-648-2553
Tara Bridges	Supervisor	Cell: 360-591-1480 Office: 360-648-2553
Ann Eng	Supervisor	Cell: 774-419-6129 Office: 360-648-2553

<b>TABLE 3-3 SITE EMERGENCY RESPONSE TEAMS</b>					
Role	“A” Shift	“B” Shift	“C” Shift	“D” Shift	Support
Emergency Coordinator	Grant Forrest or designee	Carla Jacobson or designee	Tara Bridges or designee	Scott McFate or designee	Cristian Dumitrescu
Team Coordinator	Kevin Patrick or designee	Shawn Stafford or designee	Frank Stetser or designee	Tyler Krenz or designee	Dan Krans or designee
First Aid Responder(s)	Grant Forrest	Corky Watkins Matt Mason Carla Jacobson	Tara Bridges Frank Brower	Scott McFate Jessica Calvillo	C Dumitrescu T Williams S Meehan B Inslan
Maintenance Rep.	Wayne Lloyd Chris Cobain	Bob Disher Corky Watkins	Jerry Greenland	Clint Valley Bryan Steuermann	Daniel Bellefleur
Fire Pump Operator					Corky Watkins

## 4. Emergency Evacuation Procedures and Notifications

### 4.1 Emergency Escape Routes

**Appendix 1** is a plant layout map that indicates how employees, visitors, and contractors can evacuate from specific areas within the plant. The arrows indicate the direction the personnel should take to the appropriate exit. The evacuation guidelines are:

- Remain calm.
- If it can be done safely, shut down equipment before evacuating.
- Walk quickly – DO NOT RUN to the nearest exit that provides the safest route to the designated Assembly Area.
- Go directly to the designated Assembly Area (as indicated on the plan).
- Wait at the Assembly Area for attendance to be taken.
- Do not leave the facility grounds.
- Do not re-enter the building until instructed to do so by the Emergency Coordinator.
- Site plans showing the evacuation routes are also posted throughout the site. These plans indicate primary and secondary routes of egress.

### 4.2 Assembly Areas and Accounting for Personnel

- The designated assembly areas are as follows:
  - **Assembly Area A: Flagpole in front of the facility**
  - **Assembly Area B: North parking lot at north gate**
- These Assembly Areas are also shown on the posted evacuation maps. The posted evacuation maps indicate primary and secondary routes of egress.
- If an Assembly Area could be affected by the fire, chemical release or other incident, such as a natural disaster, the Emergency Coordinator (see Emergency Response Organization Section) will direct personnel to an alternate assembly point, possibly including “Shelter in Place” instructions. Instructions will be given by two-way radio and/or using the plant paging system. Information on the site’s Shelter in Place program is provided in **Appendix 2**.
- The **Emergency Coordinator** within the Emergency Response Organization are ultimately responsible for ensuring that all personnel are accounted for. **The 5-day designated Emergency Coordinator**, if on Site, will always assume this role. During the off-shift hours and on the weekend, **the primary shift Emergency Coordinator** will assume this role. Attendance will be taken at each Assembly Area by the designated **Emergency Coordinator or Area Coordinators**. Every Team Coordinator (TC) will develop and carry a roster of their employees present on site during the respective shift. Any employee leaving the physical property must notify their supervisor when he/she leaves and when he/she returns on-site. In addition, the Visitor Log from the front lobby will be used to account for visitors, contractors, temps, and vendors on site. A list of exempt and non-exempt employees is kept in the ERP by the front door.
- It is the Emergency Coordinator’s responsibility to determine when the facility is safe to re-enter, and to communicate this to all personnel via two-way radio and/or the plant PA system.

#### 4.3 Medical Duties & First Aid

- As indicated in the Emergency Response Organization Section, the facility maintains a trained First Aid team consisting of a Primary Designee(s). The facility maintains first aid kits in multiple locations. First aid wall cabinets are mounted in the Front Office, Boiler Room, Wastewater Office, SDC Processing, SDC Packaging, Key Line Room, and the Fresh Fruit Warehouse.
- Safety Data Sheets (SDS's) for all chemicals used in the plant are located online in the Markham Intranet on the main page. These SDS's contain additional, chemical-specific first aid information. **The Hazards of Exposure to Anhydrous Ammonia** can be found in the Ammonia ERP (Appendix 10).
- For any injury requiring more than basic first aid, there is a procedure in place for contacting local emergency services. During weekday hours, the **Supervisor on Duty** should contact the **Human Resources Department**, and they will make arrangements for transporting the injured person to the company doctor's office, or will call for local emergency services (police/emergency medical technician/ambulance.) During night and weekend hours, the Supervisor on Duty should determine when outside services are needed, make the call, and provide the information requested, including the nature of the injury.
- Number to call for local emergency services (Police/EMT/Ambulance):
  - 911 Speed-dial from any plant phone
  - 911 from a cell phone

#### 4.4 Emergency Notification: Fires

The following procedure should be followed upon the discovery of a fire:

- Move to a safe location if necessary.
- Pull the manual fire alarm if not already activated. This will notify the Fire Department. *(NOTE: If the fire is in the incipient stage, a fire extinguisher may be used to extinguish it if the employee has received the training to do so.)*
- Ensure that people in the immediate vicinity of the fire are evacuated.
- Contact the facility **Emergency Coordinator** (Table 3-1, page 6) and provide the following information:
  - Your name;
  - Location and source of the fire;
  - Extent and size of the fire;
  - Location of any injured persons;
  - Remain on the line until the Emergency Coordinator has obtained all necessary information.
- If told to evacuate or there is an evacuation alarm, proceed to the Assembly Area, taking the following item:
  - The employee shift schedule and sign-in book from the front lobby.
  - Notify the Emergency Coordinator and give them your status as soon as you have all your personnel accounted for.

#### 4.4 Emergency Notification: Chemical Release

**NOTE: The Emergency Coordinator will have available and use the latest version of the Emergency Response Guidebook (ERG) in the event of a chemical/hazardous material related incident.**

The following procedure should be followed upon the discovery of a chemical release:

- Move to a safe location.
- Ensure that people in the immediate vicinity of the leak are evacuated.
- Contact the facility Emergency Coordinator (Table 3-1, page 6) and provide the following information:
  - Your name;
  - Name of chemical, source and location of leak, and extent of release;
  - Location of any injured persons;
  - Remain on the line until the Emergency Coordinator has obtained all necessary information.
- In the event of an ammonia release, immediately notify the **BOILER OPERATOR** on duty via the plant radio system or the plant paging system from any plant phone and then follow the Ammonia ERP (Appendix 10).
- Contact the Fire Department (Speed-dial 911 from any plant phone, or 911 from cell phone) as directed by Emergency Coordinator.
- If told to evacuate or there is an evacuation alarm, proceed to the Assembly Area.

#### 4.5 Emergency Notification: General

The Emergency Coordinator will assure that appropriate emergency response agencies, governmental agencies, the appropriate internal members of management, and the public are notified as warranted of the emergency incident. The Plant Director will contact the appropriate corporate representative. A listing of these individuals and organizations is listed below.

<b>TABLE 4-1 INTERNAL (PLANT) TELEPHONE NUMBERS</b>		
<b>Name</b>	<b>Office Number</b>	<b>Cell Number</b>
Brett Imsland	360-648-2513	903-335-0929
Cristian Dumitrescu – EHS Manager	360-648-2541	360-589-0222
Trevor Williams – Operations Manager	360-648-2558	360-589-4384
Sarah Meehan – Quality Manager	360-648-2533	360-310-3655
Rachel Taber – HR Manager	360-648-2524	360-591-9324
Lani Perrette – HR Generalist	360-648-2530	360-581-5597

**NOTE: If calling from a plant phone to the individual's office number, only the last four digits of the office number would be dialed. The number "9" must be dialed to contact the individual's cell phone number from a plant phone.**

<b>TABLE 4-2 INTERNAL (CORPORATE CONTACT) TELEPHONE NUMBERS</b>		
Name	Office Number	Cell Number
Carter Fahy - EHS Senior Manager	508-923-3235	774-419-2011
Scott Stears – Food Net Lead	508-946-5720	715-239-1240
Earl Larson – VP Global Supply Chain and Operations	508-923-3886	

**NOTE:** Contact the OSC Corporate personnel referenced in the above list in the order indicated. Once the first contact is made, the remaining personnel are not required to be contacted.

<b>TABLE 4-3 EXTERNAL TELEPHONE NUMBERS</b>		
Organization	Role	Number
General Emergency	General Emergency	911 (From Office Phone) 911 (From Cell Phone)
South Beach Regional Fire Authority	Fire, Aid, Spills	911
Washington State Patrol	State Hwy, spill, evacuation	360-533-9332
Grays Harbor County Sheriff Dept.	Theft, intruder, etc.	360-249-3711
Grays Harbor Community Hospital	Medical	360-532-8330
American Red Cross	Provide food, shelter, and hope during an emergency	253-474-0400
National Response Center	Report of release or spill	800-424-8802 202-267-2675
Coast Guard	Spill Response - waterways	360-268-0300
USEPA Region 10	Federal environmental oversight	205-553-6697
Olympic Region Clean Air Agency – Jim Wilson	Regional environmental air emissions oversight	360-648-2552 Office 360-581-4499 Cell
Washington State Dept. of Ecology	State spill response/chemical release oversight - land/water/air	800-258-5990
Local Emergency Planning Committee (LEPC)	Emergency response, reporting, community disaster	360-249-3911 x 292
State Emergency Response Committee (SERC)	Responsible for implementing state EPCRA provisions	360-407-6729
Department of Occupational Safety & Health <b>DOSH</b>	Part of <b>L&amp;I</b> that develops and enforces safety & health rules, safety & health resource	360-902-5580

Washington Department of Labor & Industries Division of Occupational Safety <b>L&amp;I</b>	Report hospitalization, death, amputation, loss of eye	800-423-7233
Poison Control Center	Poison Control	800-222-1222
FM Global – Christopher Woolley	Property & loss prevention insurance coverage	425-637-2368 Work 206-795-7221 Cell 206-361-8099 Home
Protection One	Fire, burglary, alarm & security monitoring	1-800-GET HELP (438-4357) PASSWORD: OCEAN
Cowlitz Clean Sweep, Inc.	Spill clean up	360-532-4309 1-888-423-6316 (24 hr.)
Safety Kleen	Spill clean up	253-639-4240
Permacold Engineering	Ammonia system repair (leaks)	425-678-8905
LPG Specialties, LLC	Propane system repair (leaks)	503-908-0101
Grays Harbor PUD Kevin Howerton	Power outage updates	360-538-6325 360-581-2069 cell
NC Power Systems	Generators	800-562-4735

**(Table 4-3 contains a contact list of the agencies to be notified during emergencies at the Markham facility. The number “9” must be dialed to contact the appropriate agency)**

## **5. Emergency Response Procedures**

### **5.1 Pre-Emergency Planning**

- Local off-site responders visit the Markham Facility annually so they will continue to be familiar with the processes, the layout of the building and property, and the potential hazards associated with responding to a crisis event.
- The local fire department visits the plant annually to conduct an inspection of the building and property. During this visit, responses to potential chemical releases, spills, fires, etc. are discussed in table top exercises.
- The site will invite the local emergency responders to participate in the annual planned evacuation drills.
- The site will provide a copy of this document to the external organizations defined in Table 5-1.
- The Emergency Coordinator will actively participate in the Local Emergency Planning Committee (LEPC) meetings and activities.
- Arrangements have been made with a local taxi service to transport employees to the local medical facility for injuries beyond what First Aid can be provided at the plant. Serious or life threatening injuries would require EMS to be contacted for continued treatment and transportation to the Grays Harbor Community Hospital.

<b>TABLE 5-1 EXTERNAL ORGANIZATIONS TO BE PROVIDED WITH THE ERP</b>		
<b>Organization</b>	<b>Address</b>	<b>Number</b>
South Beach Regional Fire Authority	170 W Spokane Ave, Westport, WA 98595	911 360-268-9832
Washington State Patrol	3111 Pacific Ave, Hoquiam, WA 98550	360-533-9332
Grays Harbor County Sheriff Dept.	100 W Broadway Ave, Montesano, WA 98563	360-249-3711
Grays Harbor Community Hospital	915 Anderson Dr, Aberdeen, WA 98520	360-532-8330
Coast Guard	1600 Nyhus St N, Westport, WA 98595	360-268-0300
Local Emergency Planning Committee (LEPC)	310 W. Spruce Street, Suite 212, Montesano, WA 98563	360-249-3911 x 292
State Emergency Response Committee (SERC)	Building 1, Camp Murray, WA 98430-5000	360-407-6729

## 5.2 Site Emergency Response Team Responsibilities

- The Site Emergency Response Team shall respond to medical (employee injury/illness), “incipient” fire emergencies and assist with evacuations.
- A medical emergency is one where additional support must be provided to assist an individual who has become unable to provide for themselves due to illness or injury.
- An “incipient” fire is a fire which is in the initial or beginning state and which can be controlled or extinguished by portable fire extinguishers without the need for protective clothing or a breathing apparatus.
- **NOTE: A “structural” fire is a fire:**
  - That has progressed to the point where it cannot be controlled or contained with portable fire extinguishers,
  - Or protective clothing and/or breathing apparatus is required due to excessive smoke or heat,
  - Or the building structure has been engaged by the fire.
- When an “incipient” fire progresses to the “structural” fire stage, the Site Emergency Response Team shall retreat, evacuate the building, and relinquish the fire-fighting responsibilities to the local fire department.
- **NOTE: The Site Emergency Response Team is specifically restricted from fighting fires that have reached “structural” stage.**
- **Composition of the Site Emergency Response Teams**
  - **Fire Emergency Response Team** - will consist of all members of the **Site Emergency Response Team** and will respond to all fires:
    - The emergency fire response is summarized in the Emergency Response Organization Section

- The response duties of the **Site Emergency Response Team** can be used as an effective tool for reviewing the emergency fire response for all personnel.
- **Medical Emergency Response Team** – will consist of members marked with an asterisk (\*) - only those members of the Site Emergency Response Team that are specifically designated and trained shall respond to medical emergencies:
  - Medical Response Team members will be selected from a volunteer list.
  - Medical Response Team members will have successfully completed First-Aid, CPR, AED, and bloodborne pathogen training.
- **Spill Emergency Response Team** – will consist of all members of the **Site Emergency Response Team** and will respond to all spills:
  - The **Spill Emergency Response Team** is trained in the safe clean up and proper disposal of chemical spills (**See MKM-EHS-042 Spill Response Procedure for Major Spills**)(Appendix 9).
  - The site safety equipment location map indicates the location of the spill clean-up kits.

### 5.3 Training

#### ■ **Site Emergency Response Team**

- All members shall receive training in basic fire-fighting techniques, the use of portable fire extinguishers:
  - Hands-on training in the use of fire extinguishers will be provided
  - All members will review the **Fire Response Plan** annually.
  - **NOTE:** Hands-on training is defined as using a fire extinguisher
- All members marked with asterisk (\*) will be trained to handle medical emergencies, their additional training will include:
  - First-Aid, CPR, AED, and Bloodborne Pathogens (BBP) for First Responders.
  - Company policies and procedures relating to BBP.

#### ■ **Employees who are not members of the Site Emergency Response Team:**

NOTE: Employees who have not been trained in the proper use of fire extinguishers, to the minimum required for the **Fire Emergency Response Team**, are specifically restricted from using them and shall be so instructed.

#### ■ **All employees shall receive annual training on the overall Emergency Response Plan and Emergency Procedures, this training will include:**

- How to report fires
- How to report and/or clean-up chemical spills (**See MKM-EHS-041 Spill Response Procedure for Minor Spills**)(Appendix 9)

- How to report medical emergencies
- Evacuation routes, assembly area locations, and personnel accounting procedures
- Natural disasters
- Civil disorder
- Bomb threats
- **Site Emergency Response Team** duties and responsibilities
- **Hazardous Communication, HAZWOPER, Hazardous Waste Training:**
  - Environmental law and permits
  - Material Safety Data Sheets (MSDS), Safety Data Sheets (SDS)
  - Specific departmental chemicals, hazards, handling, first aid, etc.
  - Hazardous materials/waste and handling procedures
  - Spill procedures and stormwater issues
  - GHS (Globally Harmonized System)
    - Facilitated by electronic training (Alchemy).
    - Training documentation is maintained on the personnel employee database.
- Specialized Training:
  - Employees involved with the handling, labeling and paperwork dealing with hazardous waste or hazardous materials.
  - The training is conducted as refresher training as needed or as required by job assignment.

## 5.4 Emergency Equipment

**NOTE: There must be clear access to all emergency equipment - access to the equipment and the condition of the equipment should be reviewed and resolved during monthly inspections.**

### 5.4.1 Fire Extinguishers, Fire Hoses, Sprinkler Risers, and Spill Kits

- All locations where fire extinguishers are mounted shall be labeled.
- Sprinkler risers will be painted red. **Appendix 6** should be used to document all sprinkler fire impairments.
- Spill Kits (See Appendix 1 for map of Spill Kit locations).
  - Spill Kit contents:
    - See MKM-EHS-041 Spill Response Procedure for Minor Spills,(App. 10) or
    - See MKM-EHS-042 Spill Response Procedure for Major Spills.(App. 10)

### Emergency Response Equipment List

ITEM	LOCATION
AMMONIA CARTRIDGES, SPARE	EHS OFFICE
AMMONIA MONITOR, HANDHELD	BOILER ROOM
BATTERIES, D CELL	PARTS ROOM
EYE WASH BOTTLES	PARTS ROOM
FANS, ELECTRIC 110 V	ELECTRICIANS OFFICE – CONFINED SPACE CART
FANS, ELECTRIC CENTRIFUGAL W/ EXPANDABLE DUCTING	ELECTRICIANS OFFICE – CONFINED SPACE CART
FLASHLIGHT, SEALED BEAM, D CELL	ELECTRICIANS OFFICE – CONFINED SPACE CART
GLOVES, RUBBER	PARTS ROOM
RADIOS, FM FREQUENCY	ALL MAINTENANCE, SUPERVISORS, SELECT OPERATIONS EMPLOYEES
RAINGEAR	PARTS ROOM
RESPIRATOR, FULL-FACE, AMMONIA CARTRIDGES	MAINTENANCE SUPERVISOR OFFICE
SAFETY BANNER TAPE	MAINTENANCE DEPARTMENT
SAWS, HACK	PARTS ROOM
STRAPS, TIE DOWN	ELECTRICIANS OFFICE – CONFINED SPACE CART
TAG ROPES	ELECTRICIANS OFFICE – CONFINED SPACE CART
TAPE, DUCT	MAINTENANCE DEPARTMENT
WRENCHES, CRESCENT 8”, 12”	MAINTENANCE DEPARTMENT

#### 5.4.2 Inspections

- All fire extinguishers and fire hoses are inspected monthly.
- Each department/area is responsible to ensure each fire extinguisher and fire hose in their respective areas have clear access to them.
- The inspection dates are noted on the inspection tags that are attached to each fire extinguisher and fire hose.
- The annual fire extinguisher and fire hose inspections are conducted by contractors.
- When a fire extinguisher needs to be replaced:

- Return the spent fire extinguisher(s) to the Spent Fire Extinguisher Holding Area located in the Maintenance Shop.
- Select a fresh, similar, unit from the replacement units in the Maintenance Shop.
- Emergency eye wash stations and showers are inspected monthly
  - Waste Water Operators are responsible for the inspections made in their respective areas.
  - The results of these inspections shall be documented on tags attached to the eye wash and shower facility.
  - Each department is responsible for weekly cleaning.
- Emergency lighting is tested monthly
  - The Maintenance Department is responsible for the monthly testing.
  - The results of the testing are documented in Maintenance Reports (Maximo).
- Emergency exits will be inspected weekly
  - Waste Water Operators are responsible for the weekly inspection.

#### 5.4.3 Emergency Alarm Systems

- The **Protection One** alarm system (plant security and fire monitoring) consists of the main control unit located in the front lobby.
  - If there is a drop in pressure of the sprinkler system (usually is an indication of open sprinkler heads). A signal will be transmitted to Protection One who will contact the South Beach Regional Fire Authority; this will cause them to respond to the plant.
  - If a security alarm is triggered a signal will be transmitted to Protection One who will then contact the Grays Harbor County Sheriff's Office, this will cause them to respond to the plant.
  - Specific plant staff member's office and home contact telephone numbers have been provided to Protection One for staff notification in the case of a plant emergency.
  - Other Protection One alarms include other signals as well (i.e. Supervisory, etc.).
  - Supervisor may silence the alarm at panel 4321 1 if the indicator is for other than fire. The supervisor investigates and clear alarm, 4321 1 to clear.
  - Once the fire/smoke alarm has been investigated and determined NO FIRE. A call to cancel the fire department may be done by notifying 911. Also, contact the ALARM CENTER 1-800-GET-HELP (438-4357). Passcode: OCEAN.
  - The internal alarm and emergency information system is composed of a series of warning tones and an intercom that utilizes the plant PA system (dial 6, wait for the tone, then press 80 then state your message):
    - A **siren** type alarm that emits a sharp wavering audible signal will be used to communicate a fire and/or external evacuation on the old sauce side. The old sauce side alarm will not automatically trigger the SDC side evacuation alarm.
    - A **buzzing fire alarm and strobe lights** is used on the SDC side of the plant to communicate a fire and/or external evacuation. An alarm on the SDC side of the plant will automatically trigger the alarm on the old sauce side also.
      - In case the intercom system fails, internal communication will be by cell radios, cell phones, and/or a megaphone.

- **NOTE:** The internal telephone and alarm systems operate on electrical power and will not operate during any power outage.

## 6. Types of Emergencies and Associated Standard Operating Procedures

### 6.1 Medical Emergency (Serious Injury/Illness)

- Sounding the Alarm:
  - Any employee witnessing a serious incident where a person is injured, in which medical attention needs to be provided at the area of occurrence shall use the PA system to summon the Supervisor and the Site Emergency Response Team.
  - Pick up the phone receiver and dial 6, wait for the tone, then press 80 and state the following on the plant PA system:

*"This is a serious injury (or medical) alert. Site Emergency Response Team please report to (Location)."  
Repeat this statement again.*

- The Emergency Coordinator, or their designee, will aid in the assessment of the illness/injury.
- Call 911 for additional medical services for serious or life threatening injuries.
- One of the Site Emergency Response Team members will be sent to the SDC ramp to direct the responding emergency medical services (EMS, etc.) from the plant's main entry gate to the incident site.
- Transportation to medical facility after the Site Emergency Response Team has rendered immediate first-aid treatment for minor/ non-life threatening injuries, shall be coordinated by authorized personnel. The responsible personnel will decide how the ill/injured individual shall be transported to the designated medical facility for treatment.

**NOTE:** During normal office hours, this decision may be made by the Emergency Coordinator, HR Manager, or another member of Management.

- Based on the following criteria all work related injuries shall be sent to:

**Grays Harbor Community Hospital  
915 Anderson Drive  
Aberdeen, WA 98520  
Phone 360-532-8330**

- The Emergency Coordinator, if not the EHS Manager, will contact the EHS Manager and Plant Director to advise them of the incident.
- Secure the scene, do not move or alter any equipment, or process.
- Conduct an incident investigation, sequester witnesses.
- Notification:

- If the employee is to be hospitalized, attempts should be made to have the employee notify their family from the hospital.
  - If the employee is incapable of notifying their family, the Operations Manager or HR shall notify the family.
  - Internal/External – In the event of injuries resulting in a death, hospitalization, an amputation, or loss of an eye, the site must notify corporate using Table 4-2, page 11. Also, Labor and Industries (800-321-6742) must be notified within eight hours of a work-related death, and within 24 hours for a work-related injury resulting in hospitalization, amputation, or loss of an eye.
- DO NOT SPEAK TO ANYONE REGARDING THE INCIDENT WITHOUT INSTRUCTIONS FROM THE PLANT DIRECTOR. WISHA/OSHA will conduct employee interviews in private if they decide to visit the plant due to a serious incident or death.
  - The Operations Manager or EHS Manager will make the notification to corporate. Ongoing communications will be conducted by the Operations Manager or Plant Director.
  - All documents, investigations, pictures, etc. will be placed in an envelope and forwarded to EHS for disposition. Maintain only one copy of records and avoid using email as a means to discuss the event.

## 6.2 Fire

- The first person responding to a fire should make every attempt to call the fire department, activate the plant emergency alarm system and, if trained, assist with their fire response. Activation of the Site Emergency Response Team should be accomplished even if the fire is controlled.
- One of the Site Emergency Response Team members will be sent to the SDC ramp to direct the responding fire department personnel from the plant's main entry gate to the incident site.

**NOTE:** The Fire Department can be notified in all cases, and should be unless the fire is out prior to notification being made. The Emergency Coordinator should assess the incident to determine if the Fire Department should be notified.

- To notify the Fire Department - Dial **911**, and state your emergency to the 911 operator. Be sure to state your name, the company name, and what part of the facility the fire is located.

**NOTE:** The 911 service will automatically give the attendant the address of the plant, please verify this address.

- **Sounding the Alarm** - When the fire is spotted, the PA system should be used to summon the Site Emergency Response Team. Dial 6, wait for the tone, then press 80 from a phone and clearly state a message indicating where the Site Emergency Response Team should respond to. The emergency alarm pull switch should also be activated so plant personnel can evacuate the building.

### 6.3 Hazardous Chemical and Hazardous Waste Substance Fire

- Upon discovery of a fire involving a hazardous chemical or a hazardous waste:
  - The Fire Dept. will be contacted;
  - All employees, visitors and contractors will be evacuated;
  - The Emergency Coordinator would determine if the Site Emergency Response Team could safely and quickly extinguish the fire. If not, they also would evacuate the building
  - The Emergency Coordinator will consult the ERG and manage the emergency response accordingly.

### 6.4 Evacuations

- May be in response to incidents which include:
  - Bomb Threats;
  - Fire;
  - Earthquake and/or tsunami;
  - Chemical spill or release.
- May be a partial or total plant evacuation.
- Will be initiated through the emergency alarm system and the PA system.
- To evacuate the plant:

*Dial 6, wait for the tone, then press 80 from a phone and clearly state a message indicating that that everyone should evacuate the building and report to the designated assembly area. (i.e. "Evacuate the building and report to the designated assembly area"). All intercom messages relative to evacuation should be repeated until you feel an adequate response is initiated.*

- The primary designated assembly area is at the flagpole located in the parking lot just outside the main employee entrance.
- The secondary designated assembly area is located north of the plant near the scale.
- Pull the emergency alarm switch located near the exit door during the evacuation.
- When instructed to evacuate, employees shall leave the plant through the nearest exit as noted on the Evacuation Map.
- Once employees have evacuated the plant to the assembly area, the Site Emergency Response Team will check the plant for any remaining individuals'.
- Employees should remain in the designated assembly area until the accounting procedure is complete, the emergency is over and they are directed to return to their work stations or are released from their shift by either the Emergency Coordinator or Plant Director.
- The status of all employees must be reported back to the Emergency Coordinator who will assure that everyone has exited the plant.
- In a fire evacuation or when an individual is not accounted for, the Emergency Coordinator will inform the ranking member of the local fire department. The fire department may send a suitably attired search team into the plant to conduct a systematic search for the missing person(s). Facility employees are not to

accompany the search team into the plant since at this point the fire may be at the "structural" stage; and facility employees are not equipped with, trained on, or qualified to use self-contained breathing equipment.

- Practice evacuation drills shall be held at least once per year. The evacuation drills will simulate one of the emergency scenarios depicted in this emergency response plan. **Appendix 5** can be used to document and evaluate the event.
- During such drills the Emergency Response Plan, EHS Manager, and designated impartial members of management shall observe all phases of the drill for deficiencies for which corrective actions shall be taken. Use the appropriate attachment to document the drill activities.
- Drills shall be conducted on all shifts.
- The list below includes, but not limited to, what should be checked prior to a drill:
  - Test the alarm system and PA system.
  - Train (or retrain) the Site Emergency Response Team members in regards to their assigned duties or responsibilities.
  - Call Protection One prior to drill.
  - Determine who will be utilized for the follow-up during and after the activation of the Site Emergency Response Team.

## 6.5 Chemical Spills and Leaks

- In an effort to limit hazards of incompatible chemical spills or co-mingling of chemicals, as well as to assist in containment of chemicals, certain hazardous chemicals are stored on containment pallets and/or are separated by concrete barriers.
- The hazardous chemicals RQ on site can be found in **Appendix 4B**.
- See MKM-EHS-041 Spill Response Procedure for Minor Spills (incidental spill or release), or MKM-EHS-042 Spill Response Procedure for Major Spills (emergency response situation) which indicate the process for responding to chemical spills (App. 10). Also, see chemical releases below for additional direction and guidelines.
- The following agencies, contractors, and/or corporate personnel will be contacted for the situations referenced below (Tables 4-1 through 4-3, Pages 10 through 12).
- In addition to Appendix 4C, the electronic Environmental Incident Report Form must be completed for spills and chemical releases:  
[http://www.ecy.wa.gov/programs/spills/forms/nerts\\_online/swro\\_nerts\\_online.html](http://www.ecy.wa.gov/programs/spills/forms/nerts_online/swro_nerts_online.html)

### 6.5.1 Fuel Oil Spill

- Incidental (small) spill:
  - ❖ If spill remains on land:
    - Trained site personnel will clean up, or contact,
    - Cowiltz Clean Sweep, Inc.
  - ❖ If spill enters waterways contact:
    - Washington State Department of Ecology.
    - National Response Center.
    - Coast Guard.

- Cowlitz Clean Sweep, Inc.
- OSC Corporate.
- Major (large) spill
  - ❖ If spill remains on land contact:
    - Cowlitz Clean Sweep, Inc.
    - OSC Corporate.
  - ❖ If spill enters waterways contact:
    - Washington State Department of Ecology
    - National Response Center.
    - Coast Guard.
    - Cowlitz Clean Sweep, Inc.
    - OSC Corporate.

#### 6.5.2 CIP spill

- Incidental (small) spill:
  - ❖ If spill remains in the building:
    - Trained site personnel will clean up.
  - ❖ If spill remains on land:
    - Trained site personnel will clean up.
  - ❖ If spill enters waterways contact:
    - Washington State Department of Ecology.
    - National Response Center.
    - OSC Corporate
- Major (large) spill
  - ❖ If spill remains in the building:
    - Trained site personnel will clean up.
  - ❖ If spill remains on land contact:
    - Cowlitz Clean Sweep, Inc. (are they capable?)
  - ❖ If spill enters waterways contact:
    - Washington State Department of Ecology.
    - National Response Center.
    - OSC Corporate.

#### 6.5.3 Propane

- The following agencies, contractors, and/or corporate personnel will be contacted for the situations referenced below. See Table 4-3, page 11 and/or Table 4-2, page 11 for telephone numbers.
  - Incidental (small) release contact:
    - LPG Specialties, LLC.
  - Major (large) release contact:
    - National Response Center.
    - LPG Specialties, LLC.
    - OSC Corporate.

- If a gas leak occurs, the ball valve nearest the leak on the supply line must be shut off. Depending on the amount of the gas leaking, the plant may need to be evacuated.
- If a fire develops with a gas leak, one of the propane emergency shutoff valves located on both ends of the front side of the propane storage tank, must be shut off and the fire department must be notified immediately.

#### Assembly areas

- The primary designated assembly area is at the flagpole located in the parking lot just outside the main employee entrance.
- The secondary designated assembly area is located north of the plant near the scale.
- If either of these locations is not suitable for assembly at the time of the emergency, the Emergency Coordinator will determine a suitable assembly location based on physical factors at that time (i.e. wind direction, drivability of the roads, type and location of the hazard).

### 6.5.4 Compressed Natural Gas – see part 5 of EAP

#### Emergency Coordinator shall:

- Verify location and extent of the release by questioning witnesses.
- Monitor the data from the current weather conditions as necessary, particularly wind speed and direction.
- Determine if the chemical release is isolated or contained. If not, determine whether to attempt isolation procedures and whether outside assistance is needed.

**Appendix 4A** provides a decision flowchart for reporting chemical releases and the forms to be used in reporting a chemical release.

- In the event the Fire Department is called to the site, the Fire Chief on site becomes the Emergency Coordinator. The site Emergency Team will follow instructions of the Fire Chief and provide any necessary information.

#### The Site Emergency Response Team

- These individuals (Table 3-3) will be assembled by the Emergency Coordinator, reporting inside the main lobby to await instructions.
- **Evacuation Coordinators** and/or **Area Coordinators** must account for personnel at the Assembly Areas.
- Accountability of employees will be done using the shift schedule.
- Additionally, any employee leaving the premises for **MUST** notify his/her supervisor when leaving the site and upon returning so the employee is accounted for should an evacuation occur.
- Contractors and visitors will report to the assembly area where they will be accounted for against the sign-in sheet.
- When instructed to do so by the Emergency Coordinator, telephone the agencies listed in Table 4-3, page 11, providing the information stipulated in **Appendix 4A & 4C**.

- Advise/assist the Emergency Coordinator in any efforts to isolate and contain the release.
- Direct administration of First Aid to injured personnel until outside assistance arrives by checking pulse, breathing, tending to ammonia/chemical burns or other injuries. If certified to do so, aid victims through administration of CPR, washing skin with water and other First Aid as needed.

#### Decontamination and Site Re-Entry/Recovery

- The last step of any hazmat response is decontamination of personnel and equipment. A shower station may need to be set up. The requirements for decontamination will be set by the Emergency Coordinator when planning any entry into a hazardous area.
- The Emergency Coordinator will make an announcement using the plant paging system when off-site responders have indicated the site is safe to re-enter.

### 6.6 Earthquake

- **If you are inside:**
  - ✓ Take cover under a desk or strong table or in a doorway.
  - ✓ Be prepared for aftershocks.
  - ✓ Stay away from windows, glass, bookcases, and outside doors.
  - ✓ Watch for falling plaster, bricks, light fixtures and other objects.
  - ✓ If the earthquake should be followed by fire, then follow procedures, which are included in the fire section.
  - ✓ DO NOT light a cigarette or strike a match due to the possibility of broken or damaged propane gas lines.
  - ✓ Do not attempt to leave the building during a severe earthquake because of the hazards of downed power lines, falling debris from the building, etc.
  - ✓ Keep away from file cabinets and other heavy objects.
  - ✓ Await instructions from Emergency Coordinator or member of management.
- **If you are outside:**
  - ✓ Move away from buildings and utility wires.
  - ✓ Watch for falling glass, electrical wires, poles or other debris.
  - ✓ Stay out of damaged buildings (an aftershock can shake them down).

### 6.7 Tsunami

A tsunami can be caused by an undersea earthquake.

- A **LOCAL TSUNAMI** could come on shore within 15 to 20 minutes after an earthquake, before there is time from a national warning system. Ground-shaking from the earthquake and/or water leaving the harbor may be the only warning.
  - ✓ If the water is seen leaving the harbor, management will evacuate all employees either to the north of the property on State Route 105 or to the third floor processing room (cooks platform) and take a headcount to ensure everyone is accounted for.

- A **DISTANT TSUNAMI** may take several hours to reach the shore. The earthquake may not be felt and the tsunami generally is smaller than that from a local earthquake. There will typically be time for official warning and organized evacuation. In the event of a distant tsunami, management will monitor weather radio and government bulletins, and provide direction to employees accordingly.
  - ✓ In the event of road closures following an actual tsunami, employees should follow guidance of local emergency management officials and report for their next scheduled shift following official re-opening of affected roads. Plant management will call employees with any updates or changes to posted schedules.
  - ✓ In the event of phone service interruption following a tsunami, plant management will post any updates or changes to schedules at the entrance to the plant.

## 6.8 Adverse Weather

- **Flooding/High Winds**
  - ✓ Markham is located within an area identified as being a 100 year flood zone. The potential flood will be a result of coastal flooding and effects from the Johns River. The anticipated impact to the facility will be primarily from the buildings being surrounded by flood waters for an undetermined amount of time. The impact may include power outages, inaccessibility, loss of refrigeration use, and in some areas flood waters may enter the key Line, fresh fruit, can dock, and in a major event the warehouse may be impacted.
  - ✓ If flooding occurs, management will evacuate all employees to the central break room and take a headcount to ensure everyone is accounted for.
  - ✓ In the event of a storm with possible flooding, EHS will determine time frame for arrival of storm conditions using NOAA.org. After hours the supervisor will need to contact EHS and/or check on the NOAA site for event timing.
  - ✓ Supervisors will contact EHS or Operations Manager for ongoing direction.
  - ✓ Operations Manager contacts Engineering and Plant Director for necessary updates and direction. The Operations Manager will direct plant shutdown activities.
  - ✓ NOAA provides the warning system for the pacific region. It provides time for people to protect themselves, vulnerable structures, and equipment, then move inland. However, it becomes difficult to move people to evacuate personnel once the storm has arrived as roadways may be impeded from downed trees, power lines, or water.
    - **Wind** watches and warnings provide a 24 to 48 hour window for upcoming events and provide time for plant preparation.
    - **High wind watch** is issued when sustained winds exceed 40 mph and/or frequent gusts over 60 mph are likely to develop in the next 24 to 48 hours.
    - **High wind warning** is issued when sustained winds exceed 40 mph and/or frequent gusts over 60 mph are occurring or imminent. Wind warnings may be issued up to 24 hours ahead of the onset of high winds and remain in effect for 6 to 12 hours.
    - **Hurricane Warning** is issued when a hurricane is expected to strike within 24 hours or less, with sustained winds of 74 mph or more and dangerously high water and waves.
    - **Gale warning** is defined as winds of 39 to 54 mph that are expected. This level triggers securing the outdoor equipment.
- **Storm warning** is defined as winds of 55 to 73 mph and is imminent.

- ✓ Supervisors and maintenance will take necessary precautions to protect the property.
- ✓ Remove totes from outside storage, secure doors and windows, review roof structure for possible damage. Inspect and prepare wastewater, tank farm, and key line in preparation for a high wind warning.
- ✓ Watch for downed power lines on the property.
- ✓ A power outage will cause the water to turn off. Restroom facilities will fail until power is resumed.
- ✓ Engineering will call and order a generator for standby.
- ✓ Supervisors and Operations Manager will ensure water is prevented from reaching dry materials or finished products by relocating them above the main floor (i.e. storage racks, upper floors in building, etc.).
- ✓ The Plant Controller will initiate the move of valuable assets (such as computers, copiers, printers, motors, pumps, compressors, powered industrial trucks, fire safe file cabinets, and chemicals) to higher ground.
- ✓ Operations Manager will determine time frame of storm conditions, and will begin emergency shutdown procedures 4 hours before impact.
  - Stop fruit delivery after emptying hopper and conduct a quick rinse.
  - Run out CCE/CCI and divert 100% hulls to presscake.
- ✓ Maintenance will shut down boiler and ammonia system.
- ✓ Employees will be instructed to leave two hours before storm arrival.
- ✓ Plant Director or HR will be responsible to provide ongoing communications with corporate.
- ✓ Operations Manager, Engineering, maintenance, and industrial truck operators will secure the site, equipment, and tools. Shutdown the equipment with controlled steps, move items to high ground, and remove debris and pallets from outside to secure locations.
- ✓ Drip pans are to be emptied to approved waste storage containers and secured.
- ✓ Secure vessels or tanks as required.
- ✓ Pumps and agitators off and valves closed.
- ✓ Drain and blow down all chemical lines.
- ✓ Secure all gas cylinders and cap those not in use. Remove any obsolete cylinders from the facility if possible.
- ✓ Unplug all electrical items.
- ✓ Ensure appropriate personnel have radios for communicating with each other.
- ✓ Operations Manager/Engineering will provide recovery assessment prior to allowing employees into the facility. This team with the assistance of the maintenance staff will oversee the re-start of all systems. Once it is determined safe, power will be restored and plant operations may continue.
- ✓ Operations may authorize a skeleton crew to remain in the plant providing arrangements for lights, heat, and sanitary facilities are met.
- ✓ Prevention strategy may include access to portable pumps to remove flood water, generators, gas powered pumps, and battery powered emergency lights beyond four hours may be useful.
- ✓ All damaged property is to be documented and pictures taken. The finance department will monitor and work closely with Risk Management for business recovery.
- ✓ Remember, all standing water should be treated as contaminated. Proper PPE must be worn.

➤ **Winter Storm/Ice**

- ✓ In the event of snow or ice accumulation, the first priority is to ensure employee safety and second to assume business as promptly as possible. Supervisors should assign available help to sweep, shovel, and place de-icer on steps and ramps. The tools for this work is stored in the industrial truck shop.
- ✓ Brumfield Construction (360-268-9231) is to be called to clear the gate operation, parking lot, and docks.
- ✓ An email notice to the shipping department should be made to ensure they understand the limitations on site and when the drive and docks are clear for use.
- ✓ Attempts to place trucks at docks in snow accumulation may lead to injury or property damage. Use of industrial trucks in said conduction may lead to injury or property damage. All efforts to ensure safe driving areas must be made.

➤ **Tornados/Water Spouts**

- ✓ Tornado/Water Spout drills should be held to prepare the employees for such an emergency. During such drills the Emergency Coordinator and a designated impartial number of employees shall observe all phases of the drill for deficiencies for which corrective actions shall be taken.
  - ✓ Drills should be conducted on all shifts. **Appendix 5** can be used to document and evaluate the event.
  - ✓ The list below includes, but is not limited to, what should be checked prior to a drill.
  - ✓ Test the alarm system.
  - ✓ Train (refresh) the Site Emergency Response Team Members in regards to the assigned duties or responsibilities.
  - ✓ Call Protection One prior to drill.
  - ✓ Determine what employees are going to be utilized for the follow-up during and after activating the Site Emergency Response Team.
- The steps to follow to determine if an evacuation is necessary due to a tornado/water spout are the following:
- If an employee hears an alert from a weather radio, or the community siren, they should immediately notify a Supervisor or Manager.
  - If it is a **tornado, or water spout watch**, and the facility could be affected, then the Supervisor/Manager needs to monitor the NOAA periodically for any changes.
  - If the watch develops into a **warning** or the original alert was a **warning**, then the Supervisor/Manager must listen carefully to the alert to determine if the facility could be in the path of the tornado or water spout.
  - If the **facility is not in the path**, personnel still needs to monitor the NOAA bulletins in case the tornado, or water spout, changes direction.
  - If management has determined the **facility is in the path of the tornado or water spout**, evacuating employees to one of the designated "safe" areas of the plant must immediately be implemented.
  - Dial 6, wait for the tone, then press 80 from a phone and clearly state a message indicating that everyone should evacuate to the designated assembly areas inside

the building due to severe weather. (i.e. "All employees are to shelter in place due to severe weather"). All intercom messages relative to evacuation should be repeated until you feel an adequate response is initiated.

○ **Procedures if you are inside:**

- Take cover under a desk or strong table or in a doorway; or sit against an inside wall. If time permits move to one of the designated "shelter in place" storm shelters located inside the plant.
- The "shelter in place storm shelters" are located in the supervisor's office, the quality lab, the hallway and restrooms behind the quality lab, the restrooms underneath the break room, and the restrooms in the front office.
- Stay inside the building.
- Stay away from windows, glass, bookcase, and outside doors.
- Watch for falling plaster, bricks, light fixtures and other objects.
- If the tornado or other severe weather should be followed by fire, then follow procedures, which are included in the fire section.
- DO NOT light a cigarette or strike a match due to the possibility of broken or damaged propane gas lines.
- Do not attempt to leave the building during a tornado/water spout or other severe weather because of the hazards of downed power lines, falling debris from the building, etc.
- Keep away from file cabinets and other heavy objects.
- Await instructions from the Emergency Coordinator or member of management.

○ **Procedures if you are outside:**

- Lay down on the ground in a ditch away from buildings and utility wires if possible. Do not get in or under an automobile.
- Watch for falling glass, electrical wires, poles or other debris.
- Stay out of damaged buildings.

## **6.9 Explosion**

Ocean Spray Cranberries, Inc. – Markham facility handles, stores, and processes flammable gasses, liquids, and solids. Explosions offer no warnings, causing disorganization and panic. If an explosion occurs, take the following steps:

- Supervisors (Evacuation Coordinators) will evacuate the plant and secure personnel. Establish communication with external professional help. Call EHS and Operations Manager for direction.
- The primary designated assembly area is at the flagpole located in the parking lot just outside the main employee entrance.
- The secondary designated assembly area is located north of the of the plant near the scale.
- Operations Manager will notify Plant Director and Engineering.
- Engineering will assess damage to workplace.

- The Site Emergency Response Team will begin triage for medical attention if needed. Move medical treatment away from the hazard zone.
- EHS and HR will provide the Health and Safety oversight. They will make family notifications if necessary, conduct investigations, and make documentation and notification to environmental agencies as appropriate.
- Operations Manager and Engineering will guide the structural, and equipment safety assessment. They will clear the facility and authorize a return or shutdown of the plant.
- The Plant Director will guide the communication.

## 6.10 Security Breach

In the event of a threat whether violence, contamination, or malicious mischief, the first goal is to secure the environment. Lock gates, sweep and lock doors, sequester involved employees, stop operations if threat may involve employees or product safety.

- Supervisors:
  - **Call Plant Director to provide investigation guidance.**
  - **Call EHS for plant security needs.**
  - **Call HR and Union Representation if interviewing employees.**
- **Plant Director will determine Police intervention.**
- Supervision – if the burglar alarm sounds off (in the lobby) or you receive a call from Protection One that a breach has occurred, investigate and call EHS. The code to silence the white panel until reset is 4321 1.
- The burglar alarm is on the well 24/7 and armed on the 3<sup>rd</sup> floor doors and tank farm between 11:00 pm and 5:00 am. Protection One will notify you by cell phone in a breach. Investigate and handle accordingly.
- The door system in the facility will alarm if a door is propped open/not latched after seven minutes.
- In the event of roof top or tank farm access during armed times, please authorize and turn off the system for that period. Code is provided to supervision only.
- Once the potential threat has been contained, HR or EHS will gather the security data for review and possible referral to the police department. HR will obtain the witness statements, and obtain the employee statement if appropriate.

## 6.11 Civil Disturbance

In case of riot or mob action directed at the company, a member of supervision shall immediately notify:

- Plant Director
- HR Manager
- EHS Manager
- Contact the Grays Harbor County Sheriff Department (360-249-3711)

**NOTE: It is important that facility employees NOT confront the demonstrators. The police will inform the demonstrators of their legal rights as well as the facility's rights. Top management will decide, whether or not, to seek an injunction or take other legal action if the company's**

rights are being violated. In some cases, it may be desirable to take pictures (from a safe distance) of the activities.

➤ **Bomb Threats - In order to reduce the possibility of a bomb threat the following general guidelines are applicable:**

- ✓ **Visitors** should be permitted to enter the building only through the lobby entrance. All employees should question any stranger or any unauthorized person as to their reason for being in the building and should notify their Supervisor of unauthorized persons in the building. Employees should be suspicious of unusual actions or conditions.
- ✓ Establish and maintain good housekeeping practices and have a "place" for everything. Investigate anything new or unusual.
- ✓ Key personnel who are near a phone that may receive a **bomb threat call** should be familiar with the following procedure:
  - If you should be the person receiving a threatening call, remain calm and try to accurately record the conversation. The form Bomb Threat Checklist (Appendix 3) will serve as a guide. This form should be kept near any phone where an incoming threat call might be received.
  - The person who receives the call should remember these points. Tell the caller that the building is occupied and many innocent people could be injured or killed. Ask these key questions:
    - ❖ **Where is the bomb located?**
    - ❖ **What does it look like?**
    - ❖ **When is it set to go off?**
    - ❖ **What kind of device is it?**
  - Try to delay the caller to get more information. If the party is willing to talk, try to find out how they know about the bomb and why is it in a particular location.
  - Even if the caller remains on the line for only a few seconds, you can obtain valuable information by listening carefully. For example:
    - ❖ Was the caller male or female, young or old?
    - ❖ Was the voice loud or soft, fast or slow, distorted, or slurred?
    - ❖ Did the caller have an accent?
    - ❖ Were they calm, agitated, intoxicated, rational, serious or joking?
    - ❖ Listen for background noises that could identify the location of the caller.
    - ❖ Remember to mark these items on the Bomb Threat Checklist (Appendix 3).
  - Notify the **Grays Harbor County Sheriff Department** by dialing **911**.
  - **Evacuation** - The person receiving the call should immediately notify the highest member of the management team on site. If top management is not on site, one of them should be notified at home. Avoid mentioning the call to others to avoid panic. The decision to evacuate or not will then be made by top management. If a decision is made to evacuate, the normal evacuation notification and procedure shall be followed.
- ✓ If a suspicious object is found, notify those in charge at once and describe the object and its location. Do not touch the object and do not allow anyone to enter the area except qualified bomb disposal personnel.

- ✓ To minimize injury to personnel and property damage the following precautions should be observed:
  - Reduce the fire hazard, shut off gas and electrical service to the area.
  - Reduce the hazard of flying glass fragments. Open all doors and windows in the area.
  - Clear the area of all personnel except the disposal team for an area of at least 300 feet in all directions.
  - Never assume that because one device has been found that it is the only device. Before employees are permitted to return, a thorough search should be conducted to insure there is no other device present.

### **6.12 Power Outages**

- ✓ In case of full loss of electrical power to the plant, employees at equipment shall, if it can be done safely, shut power off to equipment.
- ✓ Employees shall proceed to the area outside the supervisor's office.
- ✓ During a power outage, the management staff is to call a central number at the top of each hour until all members are accounted. 1-877-351-4408, Conference code 5770738858, Leader PIN 0343.
- ✓ All ITO's are to discontinue operation of Industrial Trucks until power has been restored and the lights turned on.
- ✓ During an extended period of power outage (beyond four hours), engineering will order a generator from NC Power Systems, Tukwila, WA 800-562-4735. If technical service is unavailable, on sight management may order needed equipment.
- ✓ Place a call to PUD (Kevin Howerton – 538-6325, or cell 581-2069) to get the latest update.
- ✓ Call at the top of each hour.

### **6.13 Salvage and Restoration of Business**

- ✓ Depending on the nature and consequences of the disaster, the Plant Director will determine when plant operations will resume operations.
- ✓ If the plant will be shut down during upcoming shifts, an attempt will be made to notify all employees not to report to work (by telephone and/or radio announcements).
- ✓ Salvage operations include all measures taken before, during and after a fire, or other emergency for the purpose of reducing loss from smoke, fire and water, and from minimizing business interruption:
  - An important part of the salvage job is preventing damage from water whether from hose streams, automatic sprinklers, broken piping, storms, or other sources.
  - The water damage phase of salvage work involves protecting goods and machinery from contact with water, removing water from the premises with a minimum of damage, and limiting the amount of water used after the fire is extinguished.
  - Tarpaulins, waterproof canvas covers, or plastic sheeting should be available to cover stock and equipment. An ample supply of brooms, squeegees, and scoop shovels should be available for use in cleanup of water. As much as possible, the water cleaned up should be placed in drums or the water contained until a cleanup contractor (one who specializes in industrial cleanup operations) can respond.
  - The shutdown of fire protection system valves must be coordinated with the fire department in order to properly extinguish the fire.

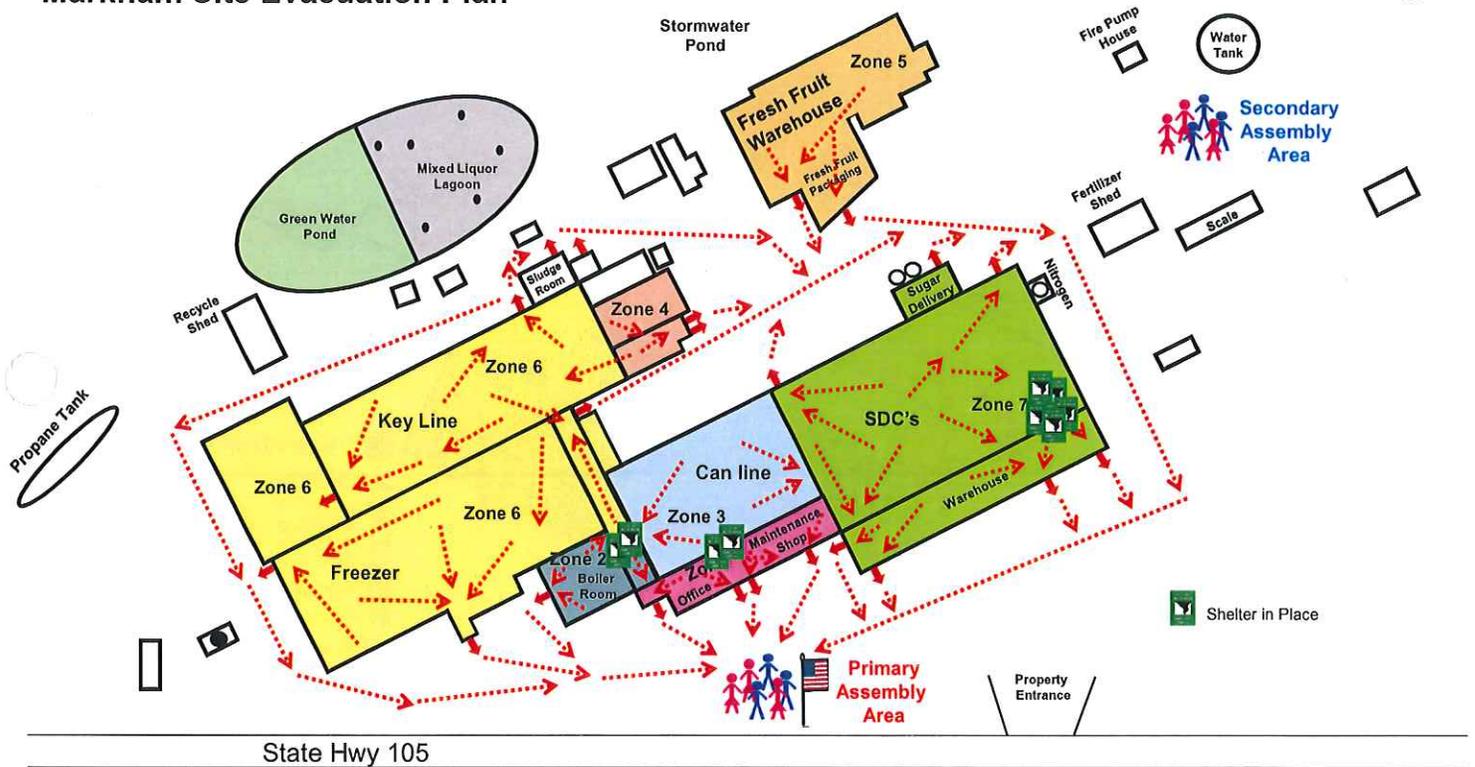
- Salvage involves the protection of the property from the effects of heat, smoke, and gaseous contaminants. This includes the removal of smoke and gases in the most efficient manner possible using blower equipment where needed.
  - Salvage includes the protection of records and equipment essential to the business during an emergency. Equipment should be covered with tarpaulins, canvas, or plastic sheeting and secured with tape, nails, staples, or other suitable means. Valuable records and papers should be removed if practical or possible. If not, file cabinets, desks, etc. should be covered as described above.
  - Salvage also includes restoration of the property to operating condition as quickly as possible after an emergency. This involves closing of any roof, window, or wall openings made during the fire or storm. Roofing material, canvas, or tarpaulins and plastic sheeting with suitable fasteners should be used for this purpose. Machinery and other equipment should be serviced, wiped down, and lubricated. Electric equipment should be cleaned and dried using various drying agents or heaters. Electrical service must be restored to provide heating and ventilation and other services.
  - After a fire, the sprinkler system should be restored to operation. This involves replacement of sprinkler or closing of valves. Finally, salvage includes the removal of debris from the area and maintenance of plant security to protect the property by an alarm system or guard service, and locking of the area involved.
- ✓ Basic Steps in Salvage Operations
- Start salvage work at once (report damage as appropriate). Salvage will be supervised and coordinated by the Plant Director, Operations Manager, and Engineering.
  - Restore protection at once. Replace open sprinklers, repair or plug broken piping and turn on water.
  - Call in sufficient number of employees at once to assist in salvage operations.
  - Close openings against the weather and remove water.
  - Separate stock into three divisions: undamaged, slightly damaged, and badly damaged. Reclaim and recondition everything possible, following experienced judgment as how best to recover the greatest value.
  - Wipe and oil machinery at once to prevent rust.
  - Dry out motors and other electrical equipment thoroughly.

#### 6.14 Contact with News Media – Press, Radio, and TV

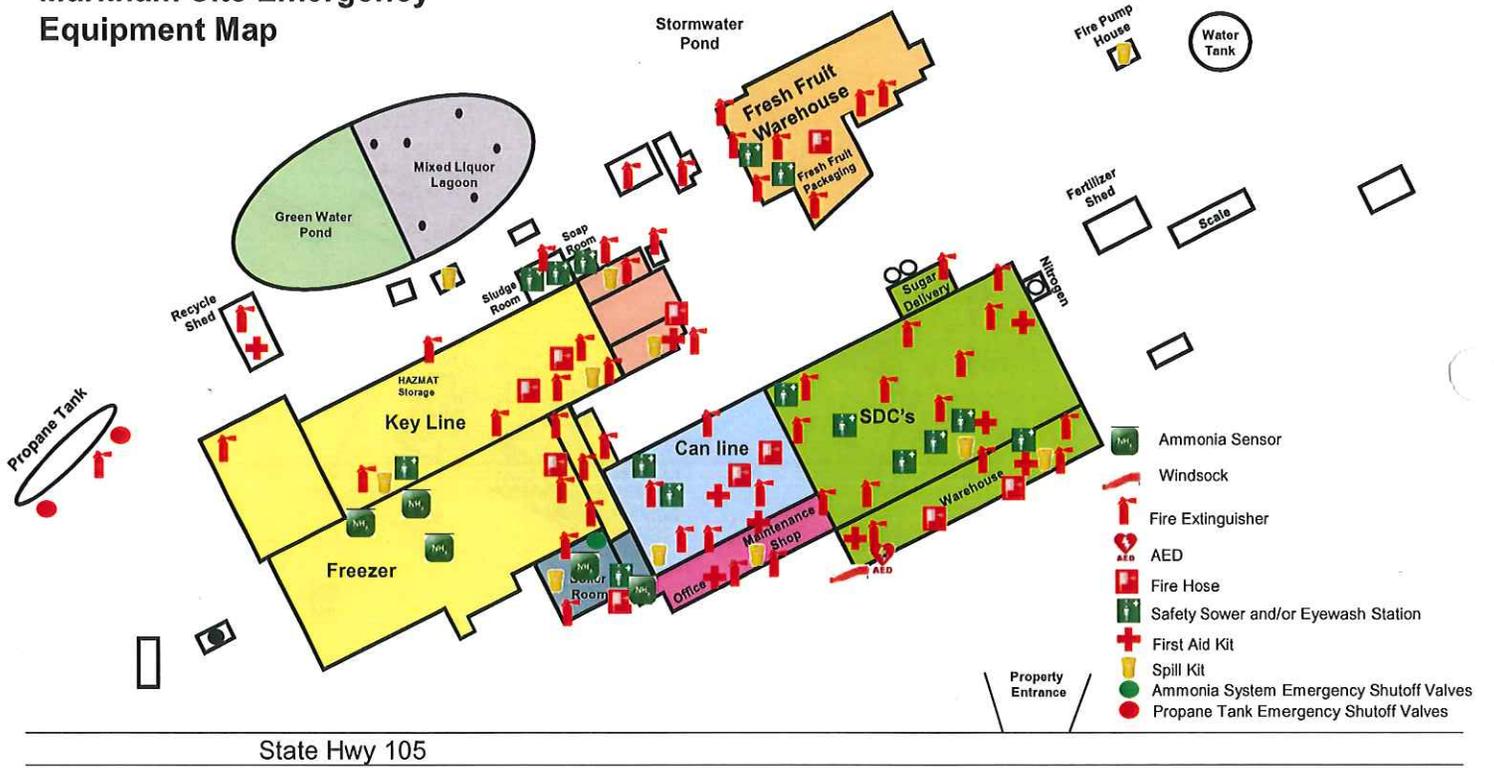
The **Plant Director** shall be the only person authorized to make official statements to the news media. In the event the **Plant Director** is not available he/she may designate the **Operations Manager** or **HR Manager** to make official statements to the news media. Any other employee approached by the media for comment should refer the media to speak to the **Plant Director**.

# Markham Site Evacuation Plan

Appendix 1



# Markham Site Emergency Equipment Map



State Hwy 105

# Shelter in Place

The purpose of this fact sheet is to give a general explanation of what "Shelter in Place" means and to tell you what we are doing about it here at Ocean Spray Cranberries, Inc. - Markham. More specific procedures for implementing Shelter in Place will be part of the Emergency Response Plan.

## What does Shelter in Place mean?

In some types of emergencies, such as a building fire, the right response is to evacuate the building. For other types of emergencies, such as one involving hazardous chemicals, or a bad storm such as tornados, water spouts, high winds, floods, etc., the safest response is often to stay put within the building you're in. This procedure is called Shelter in Place.

## Where do I Shelter in Place?

Whether you are at home or at work, you should have an area designated as your Shelter in Place, where you can stay inside and close all heating and air conditioning vents. Here at the Markham facility, we have designated areas in each major building for Shelter in Place, for a total of 5 areas to shelter all employees. These are listed on the next page.

## How will I know when to Shelter in Place?

Most often, if there is a chemical accident in the area, such as a truck accident or a storm warning, local authorities will issue warnings on the radio or by patrol car. If the company determines there is an emergency that calls for Shelter in Place, you will be notified by announcements over the plant paging system.

## What should I have with me when I Shelter in Place?

It is a good idea to bring a cell phone if you have one, and a two-way radio for in-plant communications. In addition, most emergency management agencies say you should have a supply kit containing at least a battery-operated radio, flashlight and extra batteries, duct tape, scissors, coverings for any vents or other openings, a first aid kit, water, and towels. **The Security Team has assembled a supply kit with all of these items, plus a few others, for each of the 5 designated Shelter areas here. These will be in stored in labeled containers and easily accessible.**

## What should I do after reporting to the shelter area?

The same steps should be taken whether at work or at home. Turn off heaters and air conditioners, and seal off any vent openings and spaces around doors and windows. Turn on the radio and listen for information. Do not call 911 for information; only call if there is an injury or other immediate emergency. Stay in the shelter until you are given the all-clear over the radio, over the plant two-way radios, or over the plant paging system.

# **Shelter in Place - Designated Areas**

## **Ocean Spray Cranberries, Inc. - Markham**

- 1. Supervisors Office located in SDC – SDC Processing, SDC Packaging, Warehouse, and Maintenance employees**
- 2. Quality Lab located in SDC – SDC Processing, SDC Packaging, Warehouse, and Maintenance employees**
- 3. Restrooms located behind the SDC Quality Lab – SDC Processing, SDC Packaging, Warehouse, and Maintenance employees**
- 4. Main break room**
- 5. Restrooms located in the front office – Office employees**

### **Shelter in Place Announcement:**

To be given over the plant-wide public address system in the event that there is a need to shelter in place.

**“Attention please. Please turn off all equipment and report to your Shelter in Place location immediately. Repeat – Please turn off equipment and report to your Shelter in Place location immediately.”**

**BOMB THREAT CHECKLIST**  
**Instructions: Listen, do not interrupt the caller!**

Name of Operator: \_\_\_\_\_ Time: \_\_\_\_\_ Date: \_\_\_\_\_

Caller's Sex: \_\_\_\_\_ Male \_\_\_\_\_ Female Approximate \_\_\_\_\_ Years Old  
 Identity: Age: \_\_\_\_\_

Origin of Call  
 \_\_\_\_\_ Local \_\_\_\_\_ Long Distance \_\_\_\_\_ Internal (from inside the building)

**VOICE CHARACTERISTICS**

\_\_\_\_\_ Loud \_\_\_\_\_ Soft  
 \_\_\_\_\_ High Pitch \_\_\_\_\_ Deep  
 \_\_\_\_\_ Raspy \_\_\_\_\_ Pleasant  
 \_\_\_\_\_ Intoxicated \_\_\_\_\_ Other

**SPEECH**

\_\_\_\_\_ Fast \_\_\_\_\_ Slow  
 \_\_\_\_\_ Distinct \_\_\_\_\_ Distorted  
 \_\_\_\_\_ Stutter \_\_\_\_\_ Nasal  
 \_\_\_\_\_ Slurred \_\_\_\_\_ Other

**LANGUAGE**

\_\_\_\_\_ Excellent \_\_\_\_\_ Good  
 \_\_\_\_\_ Fair \_\_\_\_\_ Poor  
 \_\_\_\_\_ Foul \_\_\_\_\_ Other

**ACCENT**

\_\_\_\_\_ Local \_\_\_\_\_ Not Local  
 \_\_\_\_\_ Foreign \_\_\_\_\_ Caucasian  
 \_\_\_\_\_ Race \_\_\_\_\_ Religion

**MANNER**

\_\_\_\_\_ Calm \_\_\_\_\_ Angry  
 \_\_\_\_\_ Rational \_\_\_\_\_ Irrational  
 \_\_\_\_\_ Coherent \_\_\_\_\_ Incoherent  
 \_\_\_\_\_ Deliberate \_\_\_\_\_ Emotional  
 \_\_\_\_\_ Righteous \_\_\_\_\_ Laughing

**BACKGROUND NOISES**

\_\_\_\_\_ Animals \_\_\_\_\_ Music  
 \_\_\_\_\_ Bedlam \_\_\_\_\_ Voices  
 \_\_\_\_\_ Quiet \_\_\_\_\_ Mixed  
 \_\_\_\_\_ Airplanes \_\_\_\_\_ Train  
 \_\_\_\_\_ Party \_\_\_\_\_ Traffic  
 \_\_\_\_\_ Office Machines  
 \_\_\_\_\_ Factory Machines

**BOMB FACTS**

Keep Caller Talking

If caller seems agreeable to further conversation, ask questions like:

When will it go off? Certain Hour: \_\_\_\_\_ Time Remaining: \_\_\_\_\_

Where is it planted? Building: \_\_\_\_\_ Area: \_\_\_\_\_

What kind of bomb? Where are you now? How do you know so much about the bomb?

What is your name and address? Hold on while I notify my supervisor.

Did the caller appear familiar with plant or building by his description of the bomb location?

Write out the message in its entirety and any other comments on reverse side of this form.

**ACTION TO TAKE IMMEDIATELY AFTER CALL**

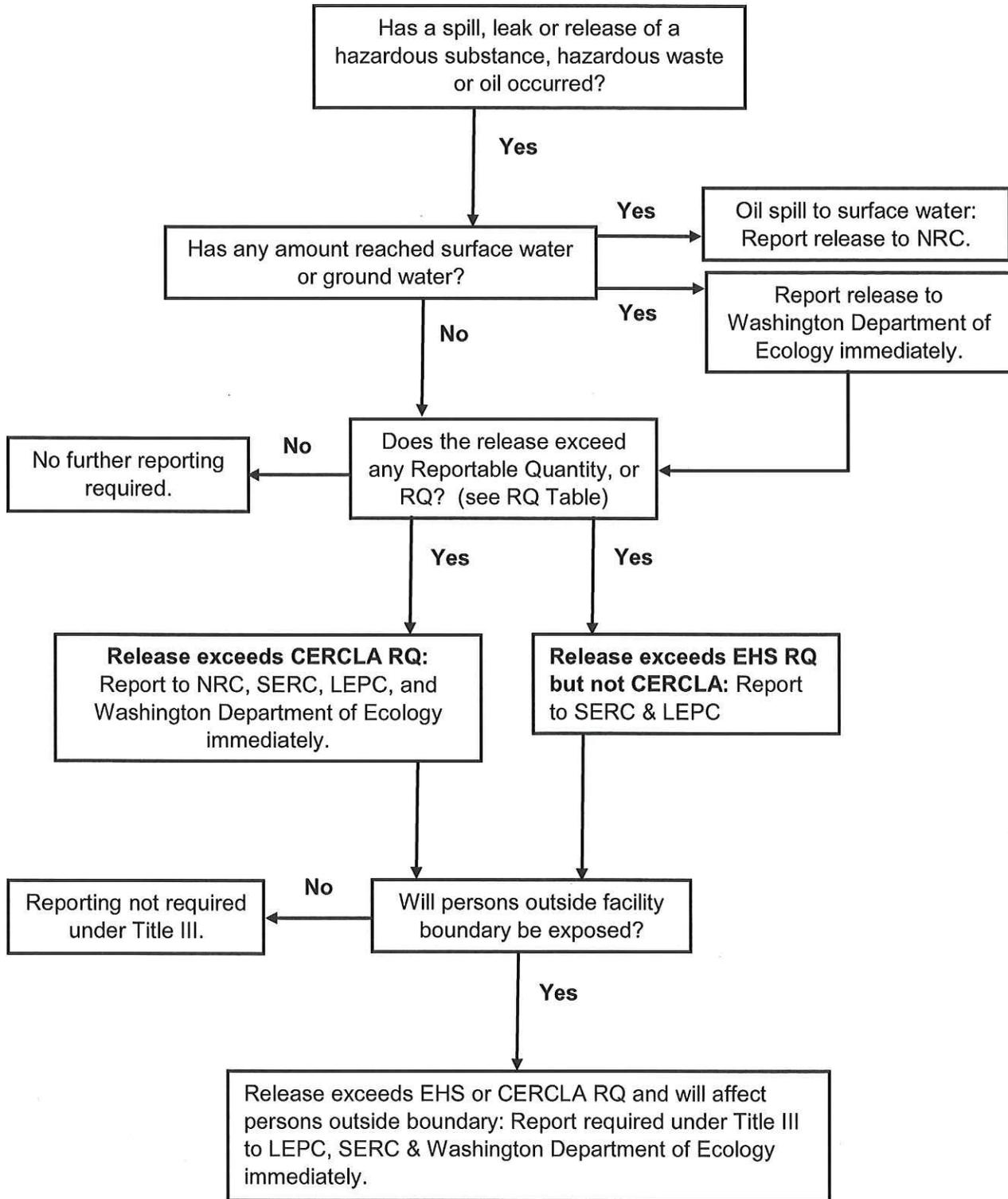
1. Notify immediate supervisor.
2. Immediate supervisor will notify the following personnel in order given:

NAME	OFFICE	CELL
Brett Insland	Plant Manager	360-648-2513
Trevor Williams	Operations Manager	903-335-0929
Cristian Dumitrescu	EHS Manager	360-648-2558
Rachel Taber	HR Manager	360-648-2541
		360-589-0222
		360-591-9324

Dial 911, state type of emergency, remain on line with 911 operator.

# SPILL / RELEASE REPORTING – DECISION FLOWCHART FEDERAL, STATE, AND LOCAL REQUIREMENTS

Appendix 4A



TELEPHONE NUMBERS AND FULL NAMES OF AGENCIES ARE PROVIDED ON NOTIFICATION LIST.

**Hazardous Material Reportable Quantities (RQ)**  
**Ocean Spray Cranberries, Inc. Markham, WA Plant**

**Appendix 4B**

Hazardous Material	CAS#	Maximum Amount Stored	Type of Container	Locations	CERCLA RQ (lbs)	EHS RQ (lbs)	Other
Ammonia (anhydrous)	7664-41-7	7700 pounds	Tank in building	Ammonia compressor room, Ammonia skids, Ammonia piping	100	100	TCPA
Fuel Oil No. 2	68476-30-2	14,500 gallons	Tank	10,000-gallon tank in secondary containment outside boiler room	Any amt. to surface water	None	
Hydrogen Peroxide (27% in Oxonia, and 35% - in Oxy-Pak)	7722-84-1	<200 gallons (in Oxonia) 1200 gallons (Oxy-Pak)	Drum- plastic	Oxonia - Chemical Storage, SDC Oxy-Pak - DC Chem Storage Area	None	1,000 (= 300 gallons Oxy-Pak).	
Methanol	67-56-1	<50 gallons (in Videojet inks)	1-quart bottle, 5-gal. pail	Maintenance Stockroom,	5,000	None	(313), U154
Methyl Ethyl Ketone	78-93-3	<50 gallons (in Videojet inks)	1-quart bottle, 5-gal. pail	Maintenance Stockroom,	5,000	None	(313), U159
Nitrogen	7727-37-9		Cylinder	Packaging	None	None	
Oils (hydraulic, lubricating)	Various	<1000 gallons	Drums	Maintenance storage shed, IPP waste storage area, Ammonia compressor room	Any amt. to surface water	None	
Potassium Hydroxide	1310-58-3	(in Quorum Amber)	Drum - plastic	Chemical Dispensing Room in old Berry Room	1,000 (about 1000 gallons Q. Amber)	None	
Propane	74-98-6	50 cylinders	Pressure Cylinder	Outdoor propane tanks and on forklift trucks	None	None	
Propylene Glycol		Approx. 1200 gallons	In Mech. Rm. and rooftop equipment	In mechanical room and rooftop equipment	None	None	
Sodium Hydroxide	1310-73-2	1,000-10,000 lbs (in Benefit), (boiler treatment)	Drum - plastic	Chemical Dispensing Room; Wastewater and Boiler Room	1,000	None	

**Hazardous Material Reportable Quantities (RQ)**  
**Ocean Spray Cranberries, Inc. Markham, WA Plant**

**Appendix 4B**

Hazardous Material	CAS#	Maximum Amount Stored	Type of Container	Locations	CERCLA RQ (lbs)	EHS RQ (lbs)	Other
Sodium Hypochlorite	7681-52-9	55-gallon drums, 500-gallon tank	Drum - plastic Tank	Chemical storage and wastewater	100	None	
Urea	57-13-6	10,000-50,000 lbs.	Bag	IPP Chemical Storage Room	None	None	

**Chemical Release Report**  
**First Call to Washington Department of Ecology**  
**(Within 15 minutes of discovery of release)**

Appendix 4C

**Call 1-800-258-5990**

1. This is **Ocean Spray Cranberries, Inc.**, 1480 WA-105, Aberdeen, Washington.
2. My name is **(name of person making the report)**.
3. I am **(your position at facility)** and my phone number is 360-648-2201, **(extension)**.
4. I am calling to report a **(chemical release of - name the chemical)**.
5. This incident occurred at **(time/date)** and **(has/has not)** been contained as of this moment. If not contained, it is expected to be contained/halted at **(estimate time event will be contained)**.
6. This is a **(choose one of the following)**:  
  
**SITE EMERGENCY**            (e.g., a chemical release has occurred that will probably **not** have an off-site impact.)  
  
**GENERAL EMERGENCY**    (e.g., a chemical release has occurred that will probably have an off-site impact.)
7. The estimated quantity of **(name of chemical)** released is **(give quantity or unknown)**.
8. The current weather conditions, as measured at the plant, are a wind speed of **(wind speed)** in a **(give direction)** direction.
9. We have **(number)** injured persons who **(will/will not)** require medical assistance.
10. We **(need/do not need)** your assistance at this time **(describe current needs)**.
11. Do you have any questions at this point?
12. Record case number if given by WDE: \_\_\_\_\_

**Chemical Release Report**  
**Follow-up Call to Washington Department of Ecology**  
**(When more information on the release is known)**

Appendix 4C

**Call 1-800-258-5990**

1. This is **Ocean Spray Cranberries, Inc.**, 1480 WA-105, Aberdeen, Washington.
2. My name is **(name and title of person making report)**.
3. I am **(your position at facility)**, and my phone number is 360-648-2201, **(extension)**.
4. I am calling with an update on an **(ammonia release / other release)** that has already been reported to the WDE at **(give time of initial notification and case number from earlier report if applicable)**.
5. The location of the ammonia **release / other release** is **(give location)**.
6. The release at this point is **(stopped/continuing)**.
7. The quantity released is estimate at **(quantity)**.
8. The measures taken to stop the release and neutralize its effects are **(provide BRIEF description if known. Do not make up response -- if you don't know, say so)!**
9. The current weather conditions, as measured at the plant, are a wind speed of **(speed)** in a **(give wind direction such as northeast, north, etc.)** direction.
10. The off-site impact has been **(provide assessment of off-site impact, e.g. odors, complaints, hospitalizations if known, etc.**

**Assessment of Emergency Response Form**  
**Ocean Spray Cranberries, Inc. - Markham Washington**

**Appendix 5**

Nature of emergency (i.e. ammonia release, propane release, other chemical release, fire, etc.)

\_\_\_\_\_ Incident \_\_\_\_\_ Drill \_\_\_\_\_

Date and time of emergency response: \_\_\_\_\_

Name of person who declared emergency: \_\_\_\_\_

Title: \_\_\_\_\_

Time of call to outside agencies, if applicable:

	Time Called		Time Called
Westport/Ocosta Fire Dept.		USEPA Region 10	
Washington State Patrol		Olympic Region Clean Air Agency	
Grays Harbor County Sheriff Dept.		Washington State Dept. of Ecology	
National Response Center		Local Emergency Planning Committee (LEPC)	
Coast Guard		Washington Department of Labor & Industries Division of Occupational Safety <b>L&amp;I</b>	

Comments and observations on emergency response plan elements:

1. The overall adequacy of the plan: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

2. The quality of plan implementation: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

3. The performance of site personnel, including the site emergency response team: \_\_\_\_\_

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4. The adequacy of emergency medical treatment procedures (if implemented): \_\_\_\_\_

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5. The adequacy of on-site and off-site communication procedures: \_\_\_\_\_

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6. The adequacy of emergency equipment, including PPE, and monitoring equipment:

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7. The adequacy of emergency power and lighting systems: \_\_\_\_\_

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## FIRE PROTECTION SYSTEM IMPAIRMENT PROCEDURE

### 1. PURPOSE:

A fire protection system impairment is any condition which affects the ability of fixed fire protection equipment to detect, control, or suppress a fire in the way it was designed or intended. If fires occur when these detection or suppression systems are impaired, the results can be catastrophic. The destruction may cause loss of life, property, and the ability to serve our customers. Even if fully ensured, some loss costs may not be recoverable.

The purpose of the impairment program is to ensure that all necessary fire precaution measures have been taken when a fire protection system becomes either intentionally or unintentionally impaired; and that the system is returned to service as soon as possible.

### 2. SCOPE:

- A. This procedure applies to the **Ocean Spray Cranberries, Inc. – Markham Facility**.
- B. The following procedures outline good practice and establish minimum standards that must be met or exceeded.

### 3. RESPONSIBILITIES:

The Plant Director is responsible to ensure this procedure is followed. The site Engineering Manager is responsible to implement this procedure whenever an impairment occurs. The EHS Manager (See **Appendix 6B**, which is posted on all sprinkler standpipes/risers) must be contacted regarding any fire protection impairment and is responsible to contact the Property and Loss Prevention Insurance provider of all impairments.

### 4. PROCEDURE

Impairments occur when any fire protection system or any piece of equipment from a fire protection system, is removed from service, either partially or completely. Fire protection systems, or equipment, are any part of the plant protection or detection systems and can include fire pumps, sprinkler or fixed protection systems, underground mains, system control panels, water supplies, fire alarms and detection devices.

Causes and Types of Impairments: An impairment may occur for a number of reasons including construction, renovations, system maintenance and testing, equipment failure, or simply human error in forgetting to activate, reset or restore a device. Impairments can be generally classified as **Planned, Emergency, or Concealed**.

#### A. **Planned Impairment**

A planned impairment is one that is scheduled and thus can be managed and organized in advance. It is typically the result of building construction and renovation or from testing, maintenance, or modification of existing protection systems. Replacing sprinkler heads, valves, or piping, adding a fire hydrant or performing dry pipe sprinkler system testing are examples of planned impairments. All replacement parts should be on hand before the

system is shut down. The work should be scheduled to occur continuously once the job has started. This will allow the opportunity to maximize the effort and minimize the amount of time to restore the fire protection system.

## **B. Emergency Impairment**

An emergency impairment occurs when an unexpected event impairs the normal function of the fire protection system. This could be the result of a frozen sprinkler pipe bursting, an industrial truck striking a sprinkler head, fire loop system hydrant struck by a vehicle, or a control failure of a fire pump during testing. Since the emergency impairment usually includes an element of urgency and confusion it is important that all key employees be familiar with the impairment program. When an emergency impairment is discovered, it is important to identify and correct the cause of the "emergency", and secure the areas and systems affected as quickly as possible.

## **C. Concealed Impairment**

A concealed impairment is an unknown impairment. It can occur when an employee or contractor fails to restore a system after testing or maintenance, when a valve is not opened all the way, or a system is taken out of service by an unauthorized person. Unfortunately, many concealed impairments are discovered only when the affected system fails to operate during a fire situation. That is why it is important to have a formal inspection and testing program for fire protection equipment and alarm systems. Locking and/or supervision of control valves can also reduce the potential for concealed impairments. To protect unattended operation of all fire system valves, fire pumps, etc., the **Ocean Spray Cranberries, Inc. – Markham Facility** has installed padlocks on these system devices. All maintenance personnel have access to the keys to these padlocks.

The key to impairment management is minimizing the time the system is impaired. This is most easily accomplished with planned impairments. If sprinkler protection is involved, as many systems as possible should be maintained in service during the work. All work should be scheduled so that, as much as possible, protection can be restored at the end of the day.

For emergency impairments, it may be prudent for repair work to continue round-the-clock until completed.

Contractors are not allowed to impair the fire protection systems without authorization from either the Engineering Manager and/or the EHS Manager.

Additional precautions include, but not limited to, the following:

- Notify EHS Manager (**See Appendix 5B**)
- Notify appropriate department management
- Notify the Site Emergency Response Team
- Notify the site security company
- Notify the local fire department. Depending on the circumstances of the fire impairment, either the **Ocean Spray Cranberries, Inc. – Markham Facility** and/or the local fire department may request that fire department personnel and equipment be assigned at the site until the impairment is resolved and protection is restored.

- Notify the Property and Loss Prevention Insurance Provider
- Shutdown hazardous processes
- Discontinue use and transfer of flammable liquids in areas where the sprinkler system is out of service
- Prohibit torch cutting, welding, grinding, and any hot work activities
- Provide extra portable fire extinguishers
- Provide a fire watch as necessary
- Implement the “Red Tag System” provided by the Property and Loss Prevention Insurance Provider. Complete the appropriate tag and place it on the affected fire protection equipment

#### D. Impairment Notification

When a planned impairment is scheduled, an emergency impairment occurs, or a concealed impairment that cannot be immediately restored is found, the **Ocean Spray Cranberries, Inc. – Markham Facility** is required to promptly notify online by following this link <https://www.fmglobal.com/report-contact-page/report-an-impairment> or by phone following the procedure outlined below:

**FM Global (425-637-2368).**

During normal business hours, the caller will be asked specific details about the impairment. After hours, when prompted, the caller should record the following information:

- Name of the caller and company
- Physical address of the plant
- Call back number
- Type of impairment and what is affected
- Estimate time until restoration
- Precautions that have been taken

The phone is available 24 hours per day and 7 days per week.

#### E. Impairment Restoration

After all work is completed, the following steps should be completed and verified by the individual who authorized the impairment:

- Fully open all valves and restore all equipment
- Conduct 2” drain test on sprinkler systems (**NOTE:** if resulting pressure drop is greater than normal, there may be a restriction or partially closed valve).
- Ensure that all fire equipment is in the “automatic” or “open” mode
- Restore all detection devices and alarm systems
- Secure appropriate valves and PIV’s with chains/padlocks
- Notify appropriate department management
- Notify the Site Emergency Response Team
- Notify the site security company
- Notify the local fire department
- Remove impairment tag(s)
- Notify the Property and Loss Prevention Insurance provider

- Retain the bottom half of the impairment tag for review by the Property and Loss Prevention Insurance provider representative and/or the corporate EHS Audit representative when requested

**F. Training**

The Engineering Manager, Operations Manager, EHS Manager, and all maintenance employees must receive training on this procedure initially upon assignment and every two years thereafter.

**G. Record Retention**

All completed impairment tags and training documentation must be retained for the previous year and the current year.

## Standpipe/Riser Information Label

**WARNING:** Do not remove this Fire Protection Equipment from service without notifying the following individual:

Name:

Company: **Ocean Spray Cranberries, Inc. - Markham**

Work Phone:

Cell Phone:

Home Phone:

Precautions as contained in the Loss Prevention Insurance Company's Impairment Card must be followed, including tagging this equipment and notifying the insurance company when removed from service.

Complete the label above, laminate, and place on all sprinkler standpipes, or risers.

## Plant Staff Phone Numbers

<b>PlantStaff</b>	<b>Mobile Number</b>	<b>Business Phone</b>
Bridges, Tara	360-591-1480	X553
Correia, Chace	508-717-4257	X584
Church, Richard	360-591-1586	x564
Dumitrescu, Cristian	360-589-0222	x541
Eng, Ann	774-419-6129	X531
Forrest, Grant	360-581-5538	x553
Godfrey, Nita	360-591-1689	X516
Hinman, Dee	360-581-4291	X566
Greenland, Denise	360-591-8483	X563
Harris, Kathy	360-470-3500	x592
Heath, Vicki	360-591-8881	X536
Imsland, Brett	903-335-0929	X513
Jacobson, Carla	360-581-4441	x531
Krans, Dan	360-591-1545	x535
McCallum, Ashley		X517
McFate, Scott	360-580-9638	X531
Meehan, Sarah	360-310-3655	x533
Perrette, Lani	360-581-5597	x530
Piehl, Glen	360-581-4499	X552
Quality Techs		x519
Sanchez, Phillip	360-589-4029	X515
Stolen, Zach	360-581-7990	x526
Taber, Rachel	360-591-9324	X524
Tisdale, Tara	360-591-1480	x553
Williams, Trevor	360-589-4384	X558

# Ferrellgas Material Safety Data Sheet - Propane

Ferrellgas

One Liberty Plaza

Liberty, MO 64068

## Section 1: Emergency Information

**24 Hour Emergency Number** Call 1-800-424-9300 (Chemtrec) in case of emergencies involving propane.

**Warning!** Extremely flammable compressed gas.

- Asphyxiant in high concentrations.
- Skin contact with liquid causes burns similar to frostbite.
- Ethyl mercaptan used as a warning agent may not be entirely effective in all situations. Read the warnings in section 9.

**NFPA hazard rating** Hazard ratings are in the following table

Health hazard = 1  
Fire hazard = 4  
Reactivity = 0



Where:  
0 = Least                      3 = High  
1 = Slight                     4 = Extreme  
2 = Moderate

**General MSDS assistance** Call 816-792-1600 and ask to speak with the Safety Department for general assistance with questions about this MSDS.

## Section 2: Hazardous Components/Identity Information

**Product** Propane (odorized)

**Chemical name** Propane

**Chemical family** Liquefied Petroleum Gas (Paraffinic Hydrocarbons)

**Hazardous components** Propane may contain various percentages of these hazardous components, depending on the source of supply.

Component	CAS Number	Percentage
Propane	74-98-6	85 - 100
Propylene	115-07-1	0 - 15
Butane and heavier	106-97-8	0 - 2.5
Ethane	74-84-0	0 - 5
Ethyl Mercaptan (Odorant)	75-08-1	<0.0025

**Section 3: Health Information**

**Purpose** The health effects are consistent with requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Eye contact** Direct contact with liquid propane can result in eye burns.

**Skin contact** Direct contact with liquid propane can result in skin burns (frostbite).

**Inhalation** This product is classified as a simple asphyxiant.  
High vapor concentrations may produce a reversible central nervous system depression (anesthesia).  
Higher concentrations may produce asphyxiation.

**Ingestion** Ingestion is not likely.

**Signs and symptoms** Eye or skin burns (frostbite) as noted previously.  
Early to moderate central nervous system depression may be evidenced by giddiness, headache, dizziness and nausea. In extreme cases, unconsciousness may occur.  
Asphyxiation may be noted by a sudden loss of consciousness. Death may quickly follow.

**Aggravated medical conditions** Caution is recommended for personnel with pre-existing central nervous system or chronic respiratory diseases.

**Acute toxicity data** Acute toxicity data is not applicable to this product.

**Carcinogenicity** This product is not classified as a carcinogen.

**Occupational exposure limits** Use this table to determine the allowable exposure limits for personnel.

OSHA		ACGIH	
PEL/TWA	PEL/Ceiling	TLV/TWA	TLV/STEL
Propane: 1,000 PPM	Not established	Butane: 800 PPM	Not established
Butane: 800 PPM			

**Cardiac effects** While there is no evidence that exposure to industrially acceptable levels of hydrocarbons have produced cardiac effects in humans, animal studies have shown that inhalation of high vapor levels of the components of this product have produced cardiac sensitization. Such sensitization may cause fatal changes in heart rhythms. This latter effect was shown to be enhanced by hypoxia or the injection of adrenaline-like agents.

**Effects of propylene** Laboratory animals exposed to high levels of propylene for prolonged periods of time showed evidence of effects in the liver, kidneys, and nasal cavity.

#### Section 4: Emergency and First Aid Procedures

<b>Purpose</b>	Follow these procedures in case of personal injuries resulting from use of this product.
<b>Eye contact with liquid</b>	Flush eyes with water. Get medical attention.
<b>Skin contact with liquid</b>	Flush with water. If frostbite or burn occurs, get medical attention.
<b>Inhalation</b>	Remove victim to fresh air and provide oxygen if breathing is difficult. Seek immediate medical attention if victim is not breathing. Give artificial respiration.
<b>Ingestion</b>	Not applicable to this product.

#### Section 5: Physical Data

**Physical properties** Refer to this table for the physical properties of this product.

Property	Value
Appearance and odor	Colorless gas, liquid under pressure. Mercaptan "rotten cabbage" odor
Boiling point	-44 degrees F.
Evaporation rate (Butyl Acetate = 1)	<1 (diffuses readily)
Flash point	-156 degrees F.
Liquid to vapor expansion ratio	1:270
Molecular weight	44.096
Solubility in water	Slight
Specific gravity (liquid)	0.500 - 0.510 (Water = 1)
Specific gravity (vapor)	1.52 (Air = 1)
Vapor pressure (maximum)	208 PSIG @ 100 degrees F.

#### Section 6: Fire and Explosion Hazards

<b>Flammability limits</b>	Flammability limits by volume in air. <ul style="list-style-type: none"><li>• Lower 2.15 percent</li><li>• Upper 9.6 percent</li></ul>
<b>Ignition temperature</b>	Auto Ignition temperature is 940 degrees, F.
<b>Extinguishing media</b>	Allow product to burn if source cannot be shut off safely. <ul style="list-style-type: none"><li>• Class B-C or A-B-C dry chemical or halon extinguishers can be used on small fires.</li><li>• Apply water from a safe distance to cool containers, surrounding equipment, and structures.</li></ul>

*Continued on next page*

**Section 6: Fire and Explosion Hazards, Continued**

**Special fire fighting procedures and precautions**      Extremely flammable. Containers may explode if not sufficiently cooled with water spray. Evacuate surrounding area of unprotected personnel and isolate. Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coats, gloves, and rubber boots) and a positive pressure NIOSH approved self-contained breathing apparatus.

**Section 7: Reactivity**

**Stability and hazardous polymerization**      This product is stable. Hazardous polymerization will not occur.

**Conditions and materials to avoid**      Avoid heat, sparks, flame and contact with strong oxidizing agents. Avoid buildups of static electricity.  
• Prevent vapor accumulation.

**Hazardous decomposition products**      Carbon monoxide and unidentified organic products may be formed during combustion.

**Section 8: Employee Protection**

**Respiratory protection**      Use a NIOSH approved respirator as required when airborne exposure limits are exceeded.  
• In accord with 29 CFR 1910.134, use either an atmosphere supplying respirator or an air purifying respirator for organic vapors.

**Protective clothing**      Avoid liquid contact with eyes or skin.  
• Wear safety glasses or goggles as appropriate.  
• Wear protective clothing as appropriate.

**Additional protective measures**      Use explosion-proof ventilation as required to control vapor concentrations.

**Section 9: Precautions For Safe Handling and Use**

**Release, spill or leak procedures**      **Warning!** Extremely flammable.  
• Eliminate sources of ignition.  
• Isolate hazard area and deny entry to unnecessary or unprotected personnel.  
• Stay upwind and keep out of low areas.  
• Notify local fire department.  
• Disperse vapor clouds with water spray.  
• Shut off source of leak only if it can be done safely.

*Continued on next page*

## Section 9: Precautions For Safe Handling and Use, Continued

<b>Training</b>	Train all personnel involved in handling propane in proper handling and operating procedures. <ul style="list-style-type: none"><li>• Document all training.</li></ul>
<b>Handling and storing</b>	Handle and store propane in accordance with NFPA 58 and local fire codes. <ul style="list-style-type: none"><li>• Keep containers away from heat sources or temperatures exceeding 130 degrees F.</li><li>• Do not drop or roll any container.</li><li>• Store and transport containers with relief valves in vapor space.</li><li>• Keep all container valves closed when not in use.</li><li>• Keep protective caps (if applicable) on containers when not in use.</li></ul>
<b>DOT cylinders</b>	Take these precautions when using DOT cylinders. <ul style="list-style-type: none"><li>• Periodically inspect and requalify DOT cylinders in accordance with DOT and NFPA 58 codes and Compressed Gas Association Pamphlets C-6 and C-6a.</li><li>• Store and use cylinders with valves off and the relief valves in the container vapor space.</li><li>• Shut all valves and follow recommended procedures before exchanging cylinders.</li></ul>
<b>Special precautions</b>	Containers, even those that have been emptied, can contain explosive vapors. <ul style="list-style-type: none"><li>• Do not cut, drill, grind, weld or perform similar operations on or near containers.</li></ul>
<b>Propane odorization</b>	<p><b>Warning!</b> Any smell of odorant, even a faint one, may indicate a dangerous situation.</p> <p>Ethyl mercaptan is the preferred warning agent for propane. Although ethyl mercaptan has excellent warning properties, "It is recognized that no odorant will be completely effective as a warning agent in every circumstance" (NFPA 58 A-1-4.1, 1992 edition).</p> <p>Instances in which odorants may lose their effectiveness include, but are not limited to:</p> <ul style="list-style-type: none"><li>• Odor may fade due to chemical oxidation in improperly prepared new tanks and cylinders or from rust, air, and water in used containers that have been allowed to stand open to the atmosphere.</li><li>• Odor may be absorbed and adsorbed by the walls of containers and distribution systems.</li><li>• Odor in the gas escaping from underground leaks may be absorbed by certain types of soils.</li><li>• Effectiveness of the odorant may be reduced by cold temperatures.</li><li>• Other odors, such as from cooking or from a musty basement, may mask or cover up the mercaptan odor in propane.</li><li>• Exposure to the mercaptan odor of propane for extended periods of time may affect a person's ability to detect the odorant.</li><li>• Physical disabilities or the use of alcohol, tobacco, or drugs may decrease a person's ability to detect the odorant.</li></ul>

## Section 10: Transportation Requirements

<b>DOT shipping name</b>	Liquefied Petroleum Gas
<b>DOT classification</b>	Division 2.1 (Flammable Gas)
<b>Other transportation requirements</b>	UN 1075, Hazardous Materials Guide Number 115. North American Industrial Classification System (NAICS) Number 454312

**Section 11: Other Regulatory Controls**

**EPA/TSCA** The components of this product are listed on the EPA/TSCA inventory of chemical substances.

**EPA Hazard Classification** This product is classified by 40 CFR 372 (SARA Section 313) as:

Acute Hazard	Chronic Hazard	Fire Hazard	Pressure Hazard	Reactive Hazard
XXX		XXX	XXX	

**Ozone depleting substances** This product does not contain, nor was it directly manufactured with, any class I or class II ozone depleting substances.

**RCRA Information** This product is not subject to 40CFR 268.30 ban on the disposal of hazardous wastes. If this product becomes a waste material, it would be an ignitable hazardous waste, having a waste code number D0001. Refer to latest EPA or state regulations regarding proper disposal. Under EPA-RCRA, containers are considered hazardous unless depressurized to a pressure approaching atmospheric. Depressurize containers at a controlled rate to a flare.

**State regulatory information** The ingredients in this product are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements.  
• Contact the appropriate agency in your state for details on your regulatory requirements.

**California Proposition 65 warning** Chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm are created by the combustion of propane.

**Section 12: Supplemental Information**

**Disclaimer of liability** The information in this MSDS was obtained from sources which we believe are reliable. **However, the information is provided without any warranty, express or implied, regarding its correctness.**

The conditions or methods of handling, storage, use and disposal of this product are beyond our control and may be beyond our knowledge. **For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the handling, storage, use, or disposal of this product.**

**Issue information** This MSDS supersedes all previous editions.  
• Issued July, 2008  
• Issued by: Scott Fenimore, Manager of Safety  
Ferrellgas  
One Liberty Plaza  
Liberty, MO 64068

Standard Operating Procedure (SOP)			
 Markham, WA	Spill Response Procedure for Minor Spills	SOP #:	MKM-EHS-041
		Rev #: 1	Rev Date: 11/20/2020
		Supersedes: 11/2/2016	
EHS	Approving Manager: Cristian Dumitrescu	Page 1 of 6	Author: Rhandi Weston

## PURPOSE

The following procedures should be used as a guide to for effective **Minor** spill control procedures in the facility.

## SCOPE

In the event of a spill involving the release of a type or quantity of a chemical which does not pose an immediate risk to health and does not involve chemical contamination to the body.

## SAFETY

A spill kit should include heavy-duty gloves made of nitrile or neoprene, chemical resistant safety glasses (goggles for areas where chemicals that may irritate eyes are used such as acids), and a disposable coat or apron. For areas where larger spills could potentially occur, a disposable protective suit and boot covers (e.g. Tyvek) should be included. Other protective equipment based on the specific facility conditions may also be necessary.

## RESPONSIBILITIES

All Facility employees.

## FREQUENCY

As required.

## SPECIAL TOOLS/EQUIPMENT

PPE: goggles, face shield, heavy neoprene or nitrile gloves, disposable coat/corrosives apron, plastic vinyl boots (disposable), and a dust mask or properly filtered respirator.  
 Emergency Response Spill Kit.

## SPILL KIT MANAGEMENT

- A container to hold spill clean-up debris. This could be a five-gallon pail with sealable lid or thick plastic bags. For larger spills, the facility should have spare 55-gallon drums and drum over-packs available.
- Granular absorbent, absorbent pads and boom, as appropriate.
- Plastic dust pan and broom for sweeping up granular absorbent. For flammable materials, ensure the dust pan is a spark-free tool.
- For larger spills, a pump to empty leaking drums as well as plugs and patching materials for drums will be available.
- Labels (e.g., Hazardous waste stickers) to properly mark containers of spill clean-up debris are available in Waste Water Treatment.
- Forceps, tongs, or other tools to pick-up contaminated debris or broken glass (if you have glass bottles of chemicals).
- Chemical Spill kit procedures.
- Basic First Aid kit (band-aids, bandages, sterile pads, medical tape, triple antibiotic ointment).

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 OCEAN SPRAY CRANBERRIES INC. – CONFIDENTIAL

**Warning: This is a controlled document, if you are reading this in printed format it might be outdated.**

SOP Title: Spill Response Procedure for Minor Spills		SOP #: MKM-EHS-041
Rev #: New	Date: 03/24/2016	Page 2 of 6

While the contents of a spill kit do not have to be stored in a single container, it should be kept together in one location. For small spill kits, five-gallon pails are often used, and for larger kits, a 55-gallon drum or over-pack may be used to contain the kit. These containers may then be used to contain spill clean-up debris.

### How to pack a spill kit?

Spill kits should be packaged in the order of when materials will be needed. Personal Protective Equipment (PPE) should be stored on the top so that it is easily accessible and reminds employees to don the PPE prior to commencing spill clean-up. Absorbent materials and other equipment needed to clean up the materials should be under the PPE. Finally, plastic bags and other materials to contain the spill debris, such as pan and broom, should be in the bottom of the kit. **See Appendix 1 for a list of proper neutralizers and absorbents.**

### Chemical Spill Kit Requirements:

Every chemical storage location that uses chemicals must have access to a spill control kit. Locate spill kits strategically near work areas so they are easily accessible in an emergency; and assure each includes containment and cleanup materials appropriate to the chemicals used in the lab. The Safety Data Sheet (SDS) for the particular chemical spilled is a preferable reference and will take precedence over this reference, if different.

### Absorbents:

- Spill socks, pillows or pads in sufficient quantity to contain a spill and keep it away from any floor drains
- Universal spill absorbent – sodium universal spill absorbent bicarbonate, and sand. This all-purpose absorbent is good for most chemical spills including solvents, acids (not good for hydrofluoric acid), and bases.
- Acid spill neutralizer – sodium bicarbonate, sodium carbonate, or calcium carbonate.
- Alkali (base) spill neutralizer – sodium bisulfate.
- Solvents – inert absorbents such as vermiculite, clay, sand, and Oil-Dri.
- Bromine neutralizer – 5% solution of sodium thiosulfate and inert absorbent.

### Clean Up Material:

- Broom, plastic dust pan and scoop.
- Plastic bags (30 Gallon, 4 mil thickness) for contaminated PPE.
- One plastic bucket (5 gallon polyethylene) with lid for spill and absorbent residues.
- Hazmat bags (chemical, biological, and / or radiological (as appropriate)).

### Other:

- Dry sand or a Class "D" fire extinguisher for spills involving alkali metals.
- Oil Dri, Zorb-All, or dry sand for acid chlorides.
- pH paper.
- Tongs.

**PROCEDURE**

1. Locate Spill Kit.
2. Notify Supervisor and / or TC of the incident immediately.
3. Isolate the area and evacuate the immediate area if necessary.
4. Remove ignition sources and unplug nearby electrical equipment.
5. Establish exhaust ventilation. Vent vapors to outside of building only (open windows and doors where applicable).
6. Choose appropriate personal protective equipment (goggles, face shield, impervious gloves, impervious coat, apron, etc.).
7. Confine and contain spill.

**Note: Contact EHS Manager Cell: (360) 589-0222 or ext.541**

8. Cover with appropriate absorbent material.
  - 8.1. Acid base spills should be neutralized prior to cleanup.
  - 8.2. Sweep solid materials into a plastic dust pan or shovel and place into a sealed 5 gallon container.
9. Wet mop spill area (Be sure to decontaminate broom, shovel, dustpan etc.
10. Put all contaminated items (gloves, clothing, etc.) into a sealed 5 gallon container or plastic bag.
11. Contain all waste in a secured remote area and contact EHS Manager for proper disposal procedures.

**CORRECTIVE ACTIONS**

Contact the EHS Manager immediately if the spill cannot be cleaned up.

**DOCUMENTATION**

Spill Kit Audit Verification Sheet.

**REFERENCES**

Spill Prevention Control and Counter measure Training  
SDS

**REVISION HISTORY**

1. Superseded Revision #: New
2. Nature of Current Revision: Enter a brief description of what changed in this revision.
3. Revision History Table (Last 2 Revisions):

Date of Rev.	Rev. #	Reviewer	Description of Change
MM.DD.YYYY	X	Name	Add brief description of change, i.e. (Updated equipment specification from X to Y)
11.02.2016	1	Dumitrescu	Changed EHS Manager phone numbers

**Appendix**

**Picture 1: List of Chemical Neutralizers, Absorbents, or Spill Containment**

<b>Chemical</b>	<b>Neutralizer, Absorbent, or Spill Containment</b>
<b>Acids</b>	<i>Sodium bicarbonate, sodium carbonate, or calcium carbonate</i>
<b>Acid Chlorides</b>	<i>Dry sand or other inert absorbent DO NOT use water or sodium bicarbonate</i>
<b>Alkali Metals (Lithium, Sodium, Magnesium, Potassium)</b>	<i>Dry sand or contents from a Class "D" fire extinguisher DO NOT use water</i>
<b>Bases</b>	<i>Sodium bisulfate</i>
<b>Bromine</b>	<i>5% solution of sodium thiosulfate or other inert material</i>
<b>Flammables</b>	<i>Activated charcoal, sand or non-combustible absorbent pads</i>
<b>Hydrofluoric Acid</b>	<i>Neutralize with soda ash or lime (or absorb with special HF spill pillow - standard spill pads will NOT work)</i>
<b>Mercury</b>	<i>Mercury amalgamate powder, such as Merc-sorb</i>
<b>Oil</b>	<i>Granular absorbent or oil-specific absorbent pads (especially important if a spill is on water; oil-specific absorbents will only absorb the oil)</i>
<b>Oxidizers</b>	<i>non-combustible absorbent pads</i>
<b>Solvents (organic)</b>	<i>Inert absorbent material</i>
<b>Thiols/Mercaptans</b>	<i>The odor of thiols and mercaptans may be removed with activated charcoal</i>
<b>White or Yellow Phosphorus</b>	<i>Cover with wet sand or wet absorbent</i>

**Picture 2: Auditing the Spill Kit**

**AUDITING SPILL KIT**

- |  |   |
|--|---|
| Spill kit # _____  | Date Audited _____  |
| <input type="checkbox"/> 15 - 15 x 20 Absorbent Pads _____             | <input type="checkbox"/> 1 - pkg Goggles, Gloves _____        |
| <input type="checkbox"/> 2 - 3" x 48 Pig Socks _____                   | <input type="checkbox"/> 2 - Disposable Aprons _____          |
| <input type="checkbox"/> 3 - 3" x 8' Pig Socks _____                   | <input type="checkbox"/> 10 - Bag Labels (Tamper Proof) _____ |
| <input type="checkbox"/> 4 - 9" x 9" Pillows _____                     | <input type="checkbox"/> 10 - Electrical Ties _____           |
| <input type="checkbox"/> 7 - 4ml Disposal Bag (must be 4ml min.) _____ | <input type="checkbox"/> 1 - Dust Pan _____                   |
| <input type="checkbox"/> 1 - Hand Broom _____                          | <input type="checkbox"/> 1 - SOP/Usage Guide _____            |

**When auditing indicate the actual quantity of each item on the \_\_\_\_\_ line next to the description**

Each kit should be audited at the time of usage, and a minimum of Quarterly. Each audit must be enclosed in the spill kit container and a copy to EHS for ordering purposes.

SOP Title: Spill Response Procedure for Minor Spills		SOP #: MKM-EHS-041
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**Picture 3: Spill Kit Audit Verification Sheet**

Spill Kit Audit Verification

This kit # \_\_\_\_\_

- Was last used on \_\_\_\_\_
- Was last audited on \_\_\_\_\_
- Signed: \_\_\_\_\_

Complete Form and leave in spill kit

Standard Operating Procedure (SOP)			
 Markham, WA	Spill Response Procedure for Major Spills	SOP #:	MKM-EHS-042
		Rev #: New	Rev Date: 11/20/2020
		Supersedes: 11/2/2016	
EHS	Approving Manager: Cristian Dumitrescu	Page 1 of 6	Author: Rhandi Weston

## PURPOSE

The following procedures should be used as a guide to for effective **MAJOR** spill control procedures in the facility.

## SCOPE

In the event of a spill involving the release of a type or quantity of a chemical that poses an **immediate** risk to health.

## SAFETY

- Strict adherence to all safety guidelines and procedures.

## RESPONSIBILITIES

- Major spills are to be cleaned by trained contractors only!

**NOTE: TRAINING – Personnel must be sufficiently trained in all aspects of handling major spills, uncontrolled fires, and explosions. Persons not suitable for this procedure must evacuate immediately.**

## FREQUENCY

As required.

## SPECIAL TOOLS/EQUIPMENT

- PPE: goggles, face shield, heavy neoprene or nitrile gloves, disposable coat/corrosives apron, plastic vinyl boots (disposable), and a dust mask or properly filtered respirator.
- Emergency Response Spill Kit.

## SPILL KIT MANAGEMENT

- A container to hold spill clean-up debris. This could be a five-gallon pail with sealable lid or thick plastic bags. For larger spills, you should have spare 55-gallon drums and drum over-packs available.
- Granular absorbent, absorbent pads and boom, as appropriate.
- Plastic dust pan and broom for sweeping up granular absorbent. For flammable materials, ensure the dust pan is a spark-free tool.
- For larger spills, you may want to have a pump to empty leaking drums as well as plugs and patching materials for drums.
- Labels (e.g., Hazardous waste stickers) to properly mark containers of spill clean-up debris.
- Forceps, tongs, or other tools to pick-up contaminated debris or broken glass (if you have glass bottles of chemicals).
- Chemical Spill kit procedures.
- Basic First Aid kit (band-aids, bandages, sterile pads, medical tape, triple antibiotic ointment).

While the contents of a spill kit do not have to be stored in a single container, it should be kept together in one location. For small spill kits, five-gallon pails are often used, and for larger kits, a 55-gallon drum or over-pack may be used to contain the kit. These containers may then be used to contain spill clean-up debris.

SOP Title: Spill Response Procedure for Major Spills		SOP #: MKM-EHS-042
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### How to pack a spill kit?

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### Chemical Spill Kit Requirements:

Every chemical storage location that uses chemicals must have access to a spill control kit. Locate spill kits strategically near work areas so they are easily accessible in an emergency; and assure each includes containment and cleanup materials appropriate to the chemicals used in the lab. The Material Safety Data Sheet (MSDS) for the particular chemical spilled is a preferable reference and will take precedence over this reference, if different.

### Absorbents:

- Spill socks, pillows or pads in sufficient quantity to contain a spill and keep it away from any floor drains
- Universal spill absorbent- sodium universal spill absorbent bicarbonate and sand. This all-purpose absorbent is good for most chemical spills including solvents, acids (not good for hydrofluoric acid), and bases.
- Acid spill neutralizer - sodium bicarbonate, sodium carbonate, or calcium carbonate
- Alkali (base) spill neutralizer - sodium bisulfate
- Solvents - inert absorbents such as vermiculite, clay, sand, and Oil-Dri.
- Bromine neutralizer - 5% solution of sodium thiosulfate and inert absorbent

### Clean Up Material:

- Broom, plastic dust pan and scoop
- Plastic bags (30 Gallon, 4 mil thickness) for contaminated PPE
- One plastic bucket (5 gallon polyethylene) with lid for spill and absorbent residues
- Hazmat bags (chemical, biological, and / or radiological (as appropriate).

### Other:

- Dry sand or a Class "D" fire extinguisher for spills involving alkali metals
- Oil Dri, Zorb-All, or dry sand for acid chlorides.
- pH paper
- Tongs

### PROCEDURE

1. Evacuate the building by activating the nearest fire alarm.
2. Shut off spill source if possible.
3. Contact EHS Manager (360) 589-0222 or ext. 541 to determine if the spill is considered Minor or Major. If spill is considered Major, contact Cowlitz Clean Sweep, Inc. to 360-532-4309 or 1-888-423-6316 (24 hr.) to request a clean-up crew.

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4. If the accident involves personal injury or personal chemical contamination:
- 4.1. Call **9-1-1** and give details of the accident including:
    - 3.1.1 Location.
    - 3.1.2 Hazardous materials involved.
    - 3.1.3 Whether there is personal injury.
    - 3.1.4 Control measures already taken.
    - 3.1.5 Your name and phone number.
    - 3.1.6 How you can be identified when emergency personnel arrive at the scene.
  - 4.2. Move the victim from the immediate area (providing it can be done without self-injury).
  - 4.3. Remove any contaminated clothing from the victim.
  - 4.4. Flush all areas of the body contacted by chemical with water. Minimum 15 minutes.
  - 4.5. Administer first aid (if required) and seek medical attention.

**DOCUMENTATION**

Spill Kit Audit Verification Sheet.

**REFERENCES**

Spill Prevention Control and Counter measure Training  
SDS

**REVISION HISTORY**

1. Superseded Revision #: New
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Date of Rev.	Rev. #	Reviewer	Description of Change
MM.DD.YYYY	X	Name	Add brief description of change, i.e. (Updated equipment specification from X to Y)
MM.DD.YYYY	1	Dumitrescu	Added phone numbers for EHS Manager. Added requirement to contact EHS Manager for spill type determination. Added requirement to contact Cowlitz Clean Sweep, Inc. for major spills clean-ups. Changed clean-up responsibility to trained contractors only.

**Appendix**

**Picture 1: List of Chemical Neutralizers, Absorbents, or Spill Containment**

<b>Chemical</b>	<b>Neutralizer, Absorbent, or Spill Containment</b>
<b>Acids</b>	<i>Sodium bicarbonate, sodium carbonate, or calcium carbonate</i>
<b>Acid Chlorides</b>	<i>Dry sand or other inert absorbent DO NOT use water or sodium bicarbonate</i>
<b>Alkali Metals (Lithium, Sodium, Magnesium, Potassium)</b>	<i>Dry sand or contents from a Class "D" fire extinguisher DO NOT use water</i>
<b>Bases</b>	<i>Sodium bisulfate</i>
<b>Bromine</b>	<i>5% solution of sodium thiosulfate or other inert material</i>
<b>Flammables</b>	<i>Activated charcoal, sand or non-combustible absorbent pads</i>
<b>Hydrofluoric Acid</b>	<i>Neutralize with soda ash or lime (or absorb with special HF spill pillow - standard spill pads will NOT work)</i>
<b>Mercury</b>	<i>Mercury amalgamate powder, such as Merc-sorb</i>
<b>Oil</b>	<i>Granular absorbent or oil-specific absorbent pads (especially important if a spill is on water; oil-specific absorbents will only absorb the oil)</i>
<b>Oxidizers</b>	<i>non-combustible absorbent pads</i>
<b>Solvents (organic)</b>	<i>Inert absorbent material</i>
<b>Thiols/Mercaptans</b>	<i>The odor of thiols and mercaptans may be removed with activated charcoal</i>
<b>White or Yellow Phosphorus</b>	<i>Cover with wet sand or wet absorbent</i>

**Picture 2: Auditing the Spill Kit**

**AUDITING SPILL KIT**

- |  |   |
|--|---|
| Spill kit # _____  | Date Audited _____  |
| <input type="checkbox"/> 15 - 15 x 20 Absorbent Pads _____             | <input type="checkbox"/> 1 - pkg Goggles, Gloves _____        |
| <input type="checkbox"/> 2 - 3" x 48 Pig Socks _____                   | <input type="checkbox"/> 2 - Disposable Aprons _____          |
| <input type="checkbox"/> 3 - 3" x 8' Pig Socks _____                   | <input type="checkbox"/> 10 - Bag Labels (Tamper Proof) _____ |
| <input type="checkbox"/> 4 - 9" x 9" Pillows _____                     | <input type="checkbox"/> 10 - Electrical Ties _____           |
| <input type="checkbox"/> 7 - 4ml Disposal Bag (must be 4ml min.) _____ | <input type="checkbox"/> 1 - Dust Pan _____                   |
| <input type="checkbox"/> 1 - Hand Broom _____                          | <input type="checkbox"/> 1 - SOP/Usage Guide _____            |

**When auditing indicate the actual quantity of each item on the \_\_\_\_\_ line next to the description**

Each kit should be audited at the time of usage, and a minimum of Quarterly. Each audit must be enclosed in the spill kit container and a copy to EHS for ordering purposes.

SOP Title: Spill Response Procedure for Major Spills		SOP #: MKM-EHS-042
Rev #: New	Date: 03/24/2016	Page 6 of 6

**Picture 3: Spill Kit Audit Verification Sheet**

Spill Kit Audit Verification

This kit # \_\_\_\_\_

- Was last used on \_\_\_\_\_
- Was last audited on \_\_\_\_\_
- Signed: \_\_\_\_\_

 Lakeville, MA	Fire Prevention Policy	DOC #:	2-26 Fire Prevention
		Rev #: Original	Date: 12/4/2018
		Supersedes: N/A	
EHS	Approving VP: Earl Larson	1 of 11	Author: Carter Fahy

## Cover Sheet

### REVISION HISTORY

1. Superseded Revision #: N/A
2. Nature of Current Revision: Original
3. Revision History Table:

Date of Rev.	Rev. #	Description of Change
December, 2018	Original	N/A

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## PURPOSE

The purpose of the fire prevention policy is to ensure that all Ocean Spray facilities implement a fire prevention plan in accordance with OSHA Standard 29 CFR 1910.39/WAC 296-24-567. Implementation of this policy helps to prevent fires in the workplace and control hazards that may lead to a fire.

## SCOPE

This policy details the minimum requirements that must be met or exceeded for Ocean Spray corporate office, plants and receiving stations to meet the requirements of 29 CFR 1910.39/WAC 296-24-567. Those requirements are as follows:

A written fire prevention plan must be in writing, be kept in the workplace, and be made available to employees for review. The minimum elements of a fire prevention plan include:

1. A list of all major fire hazards, proper handling and storage procedures for hazardous materials, potential ignition sources and their control, and the type of fire protection equipment necessary to control each major hazard;
2. Procedures to control accumulations of flammable and combustible waste materials;
3. Procedures for regular maintenance of safeguards installed on heat-producing equipment to prevent the accidental ignition of combustible materials;
4. The name or job title of employees responsible for maintaining equipment to prevent or control sources of ignition or fires; and
5. The name or job title of employees responsible for the control of fuel source hazards.

Ocean Spray must inform employees upon initial assignment to a job of the fire hazards to which they are exposed, and review with each employee those parts of the fire prevention plan necessary for self-protection.

## REFERENCE

The scope of the Fire Prevention Plan includes by reference, Ocean Spray's Propane Management Policy (EHS 2-02), Electrical Safety Policy (EHS 2-05), Hazardous and Universal Waste Policy (EHS 2-07), Hotwork Policy (EHS 2-13), Powered Industrial Truck Policy (EHS 2-14), Fire Protection Systems Policy (EHS 2-23), Red Tag Permit Policy (EHS 2-24), and Transfer of Flammable Ingredients SOP. Conformance and Implementation of each of these documents help to ensure the prevention of fires at each location.

## RESPONSIBILITIES

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1. **Corporate Office Director, Plant/Receiving Station Manager.** Responsible for providing sufficient resources (i.e. time and budget) and allocating proper authority to ensure proper management of this policy.
2. **Senior Leadership Team.** Responsible for ensuring that their Fire Prevention program meets or exceeds all applicable regulations, and is established and maintained for the protection of all personnel and assets at the plant/receiving station.
3. **EHS Manager.** Responsible for the implementation and ongoing success of this policy. The EHS manager is responsible for assigning and coordinating with the program owner to ensure continued compliance with the policy.
4. **Fire Prevention Program Owner.** The Fire Prevention Program Owner is responsible for:
  - 4.1. Coordinating the proper *implementation* of the program; this includes ensuring that roles and responsibilities have been appropriately defined for the facility's program and are communicated to the applicable individuals;
  - 4.2. Being aware and familiar with applicable NFPA, local, state, and federal rules, and the local authority having jurisdiction for fire protection.
  - 4.3. Ensuring individuals charged with executing the requirements of this Program are properly trained to do so; and
  - 4.4. Updating the Fire Prevention information (Appendix A) when conditions and/or procedures change.
5. **Contractors.** Responsible for complying with all aspects of the policy.

## EVALUATION PROCEDURE

The effectiveness of this policy will be evaluated by observing its implementation at the corporate office, plants and receiving stations, including conformity with training requirements and adherence to the allowances, restrictions, and required actions stipulated herein. A formal evaluation will be done by the EHS Network periodically as needed, but no less than every three years.

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## **POLICY**

A written Fire Prevention Plan is a requirement for all Ocean Spray facilities. The required content of a written Fire Prevention Plan is listed below and should be outlined in Appendix A for each location. Example information for each section of the written Fire Prevention Plan is detailed in Appendix B of this policy.

- A list of all major fire hazards, proper handling and storage procedures for hazardous materials, potential ignition sources and their control, and the type of fire protection equipment necessary to control each major hazard;
- Procedures to control accumulations of flammable and combustible waste materials;
- Procedures for regular maintenance of safeguards installed on heat-producing equipment to prevent the accidental ignition of combustible materials;
- The name or job title of employees responsible for maintaining equipment to prevent or control sources of ignition or fires; and
- The name or job title of employees responsible for the control of fuel source hazards.
- Fire Prevention training program.

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## Appendix A

### Required Location-Specific Program Elements

- The name or job title of employees responsible for maintaining equipment to prevent or control sources of ignition or fires
  - Program Owner: EHS Manager - Cristian Dumitrescu
  - Program Co-owner: Quality Manager – Sarah Meehan
    - Employees responsible for maintaining equipment: Maintenance Manager (Richard Church); Maintenance Planner (vacant); Tech Services Manager (Glen Piehl); Electrician; Mechanics; Electro-mechanics.
  
- The name or job title of employees responsible for the control of fuel source hazards;
  - Wastewater operators (haz waste/non-haz waste); boiler mechanics; all trained forklift operators; fire pump mechanics.
  
- A list of all major fire hazards, proper handling and storage procedures for hazardous materials, potential ignition sources and their control, and the type of fire protection equipment necessary to control each major hazard (See appendix B);
  
- Procedures to control accumulations of flammable and combustible waste materials (see appendix B);
  
- Procedures for regular maintenance of safeguards installed on heat-producing equipment to prevent the accidental ignition of combustible materials (see Appendix B); and
  
- Fire Prevention training program (See appendix B).

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## Appendix B

### Elements for Location-Specific Fire Prevention Plan

*The name or job title of employees responsible for maintaining equipment to prevent or control sources of ignition or fires:*

- Fire Prevention Plan Program Owner (EHS Manager):
  - Coordinate monthly and annual inspections of fire extinguishers and hoses.
  - Ensure the conformance and proper implementation of the policies listed in the REFERENCES Section.
  - Conduct monthly inspections of hazardous, universal and solid waste storage locations and ensure proper housekeeping.
  - Schedule proper disposal of wastes in order to prevent accumulation.
  - Ensure all required training is performed and documented.
  
- Department Managers:
  - The Operations Manager shall ensure cleanliness of Production Areas/Equipment including accumulation of solid waste and corrugate-related dust.
  - The Maintenance Supervisor shall ensure cleanliness of maintenance shop, adherence to the policies referenced in the REFERENCES Section, coordinate maintenance activities to ensure wipe-down of equipment, removing excess grease and oil, and sweeping up dust and debris.
  - The Engineering/Technical Services Manager will ensure the maintenance of fixed fire suppression systems and related alarms.
  
- Shift Team Coordinators/Shift Supervisors:
  - Perform pre-shift meeting (hand-off meeting) with prior shift's Team Lead/Supervisor to determine what if any safety or housekeeping issues exist.
  - Coordinate with employees on shift to correct any housekeeping issues or deviations as they occur (paper/corrugate/dust build-up).
  
- Powered Industrial Truck Drivers:
  - Shall ensure proper procedures are followed when replacing propane tanks, and when refilling batteries for electric powered industrial trucks.
  - Shall clean trucks of dust and debris as observed.

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- Maintenance Planner:
  - Schedule inspection and preventative maintenance tasks on heat-producing equipment.
  - Develop and assign PMs that include procedures for regular maintenance of safeguards installed on heat producing equipment to prevent the accidental ignition of combustible materials. Procedures will include inspection and cleaning of safeguards and initiating repairs of any hazards or concerns.
  
- Maintenance Technicians:
  - Ensure welding and heat-producing equipment and safeguards are in proper working order prior to starting work.
  - Ensure lid to parts washer tub remains closed when not in use (if other than aqueous solution is used).
  - Perform maintenance tasks (servicing, lubrication, welding, etc.) per policies referenced in the REFERENCES Section in order to ensure proper operation and prevent friction or ignition.
  - Conduct proactive and preventative procedures to reduce friction, sparking, or anything that can generate heat.
  - Ensure maintenance of equipment and safeguards of heat-producing equipment includes wiping down equipment of chemicals or lubricants.
  
- Operators:
  - Shall be attentive to the accumulation/buildup of combustible solid waste (corrugate), which should be removed from the production floor and placed in the accumulation bins located outside and along the south side of the Plant/Station Building.

Major fire hazards:

- Portable propane tanks used on the Plant forklifts. These tanks are on propane-powered forklifts.
- Boiler burner
- Oil used and stored in the Foklift Shop. These are properly managed, stored, and used in accordance with the Safety Data Sheet.

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- Solvents (Methyl ethyl ketone, Acetone) used on the Production Floor (inkjet printer, labeler) and Hexane in the SDC lab. These are properly managed, stored, and used in accordance with the Safety Data Sheet.
- Used Oil/Solvents located in the Hazardous Waste Storage Shed. These are managed in accordance with the Plant's Hazardous Waste Policy.
- Tray Corrugate in Warehouse/Production Floor. Storage/Accumulation is avoided through housekeeping/oversight of Shift Supervisor.
- Temporary storage of Used Corrugate in Warehouse. Storage/Accumulation is avoided through housekeeping/oversight of Shift Supervisor.
- Potential combustible corrugate debris accumulation in Box Formers. Storage/Accumulation is avoided through housekeeping/oversight of Shift Supervisor.
- Waste Corrugate (recycle) in the recycle shed or the cored dock on south side of key line. Storage/Accumulation is avoided through oversight of WW treatment operator who handles shipment of carboard bales.
- Waste corrugate in the baler area. This risk is reduced by good housekeeping practices.
- Storage of Knock Down berry totes in the south side of the plant. Smoking is prohibited everywhere in the facility. Hot work permit is required when conducting hot work outside of the maintenance shop.
- Proper handling and storage procedures for hazardous materials:
  - Authorized employees (Wastewater Operators) are trained on the proper handling and storage procedures for hazardous materials prior to be assigned full responsibilities for these tasks.
- Potential ignition sources and their control:
  - Welding and spark-producing activities will be conducted in the designated hotwork area in the Maintenance Shop. When welding or spark-producing

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activities are necessary in an area other than the designated area, a hot work permit will be used. Welders will inspect welding equipment prior to each use.

- Forklift trucks. Pre-shift inspections are conducted (Shockwatch) and routine maintenance of the truck is performed per an outside contractor (Brodie-Toyota).
- Friction from operating machine parts. A lubrication program is in place and inspections and cleaning occur frequently per Maximo and Operator CILs (Clean, Inspect, and Lubricate).
- Electrical cabinets remain closed and latched to prevent internal dust build-up during normal machine operation. Proper electrical safeguards are conducted when working with an open electrical cabinet to minimize a fire hazard.
- Combustibles, such as waste liquids, raw materials (corrugate), and solid waste (corrugate debris), are stored separately from heat-producing equipment, and its accumulation is controlled by off-site removal by contractors.
- A floor sweeper is used frequently to clean floor surfaces and prevent the build-up of dust and debris.
- Fire Protection Equipment:
  - Overhead building sprinklers are in place to control fires in select open areas (SDC).
  - Water hoses are available to control incipient stage fires in select open areas (old sauce line, key line).
  - Fire extinguishers are available throughout the facility to control smaller incipient stage fires.
  - Welding blankets, curtains and other protective equipment is available to minimize risk of hotwork activities.

*Procedures to control accumulations of flammable and combustible waste materials:*

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- Corrugate solid waste (corrugate), should be removed from the production floor/warehouse and placed in the key line dock covered area after it has been baled. Cardboard bales can also be stored in the recycle shed.
- Flammable liquids should be stored in flammable cabinets when not in use. Cabinets filled to capacity should be inspected to ensure expired/chemicals no longer used are properly shipped off-site.
- Propane tanks are stored in a metal cage in the maintenance shop.
- All chemical and flammable cabinets are to be labeled with the appropriate warnings to notify employees (Flammable—Keep Fire Away).
- Monthly inspections are conducted in the universal and hazardous waste storage areas to ensure proper storage requirements, waste collection, and housekeeping.
- The used oil tank located in the forklift shop is emptied by a licensed transporter prior to being overfilled.
- The solvent tank in the maintenance shop will be serviced by a licensed contractor (Safety Kleen).
- Combustible corrugate debris, which may accumulate in the tray packers will primarily be cleaned by sweeping or wiping down equipment. Debris will be removed and disposed of, reducing the likelihood of hazard exposure.
- Required PPE will be used to minimize risk of exposure.
- No storage of combustibles or flammables is allowed under stairways.

*Procedures for regular maintenance of safeguards installed on heat-producing equipment to prevent the accidental ignition of combustible materials:*

- Cleaning/maintenance of equipment shall be done in a manner and schedule per manufacturing instructions that is laid out in the Plant's Maximo Maintenance Plan

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*Fire Prevention training program:*

The Fire Prevention Program Owner shall train employees upon initial assignment to a job of the fire hazards to which they are exposed, and measures for self-protection. This specific training requirement is accomplished by the Plant through execution of other programmatic training requirements that involve fire prevention:

- Electrical Safety Policy (EHS 2-05)
- Hazardous and Universal Waste Policy (EHS 2-07)
- Hotwork Policy (EHS 2-13)
- Powered Industrial Truck Policy (EHS 2-14) (as needed)
- Housekeeping
- Red Tag Permit Policy (EHS 2-24) (as needed)

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**EMERGENCY RESPONSE PLAN (ERP)  
Ammonia Refrigeration**



**Ocean Spray Cranberries Inc.  
1480 State Rte. 105  
Markham, WA 98520**

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Appendices

A: Ammonia MSDS

B: External Emergency Notification List

C: Site Evacuation and Emergency Equipment Maps

D: Ammonia Alarm System Training

E: Ammonia System Shutdown Procedures

F: Ammonia System Piping Schematic

## **1.0 Introduction**

The purpose of the Emergency Response Plan (ERP) is to protect the employees of Ocean Spray Cranberries – Markham Facility by responding to an uncontrolled release of ammonia in a safe and timely manner. It identifies the response actions and responsibilities of this facility in accordance with Chapter 296-824 Washington Administrative Code (WAC) and Federal OSHA Emergency Response provision in 29 CFR 1910.120(q).

The Ocean Spray Cranberries – Markham Facility Emergency Response Plan includes a description of the following:

- Pre-emergency planning and coordination with outside parties
- Personnel roles, lines of authority, training and communication
- Emergency recognition and prevention
- Safe distances and places of refuge
- Site security and control
- Evacuation routes and procedures
- Decontamination
- Emergency medical treatment and first aid
- Emergency alerting and response procedures
- Critique of response and follow-up
- Personal protective equipment (PPE) and emergency equipment

This Ammonia ERP is integrated and supported by the following Ocean Spray-Markham plans:

- Site Emergency Response Plan
- Business Continuity Policy
- Food Defense and Security Policy
- Ammonia Refrigeration Management Program (ARM)

## 2.0 Ammonia Description

Ammonia is a colorless gas with a characteristic strong suffocating odor. Anhydrous ammonia will bond readily with water, either in the air or on skin, to form caustic aqueous ammonia which may readily cause severe burns and tissue damage. The odor threshold for ammonia is approximately 15 ppm, which is substantially below the level considered Immediately Dangerous to Life and Health (IDLH), and employees will, therefore, likely detect any ammonia before it may cause adverse health effects. For additional information regarding ammonia, see the attached MSDS (Appendix A).

<b>Property</b>	<b>Ammonia (anhydrous)</b>	<b>Aqueous Ammonia</b>
Odor Threshold	1-15 ppm	2-50 ppm
pH	11.6	14
Color and Odor	Colorless, pungent odor	Colorless, pungent/suffocating odor
Physical State	Gas	Liquid
TLV - TWA	25 ppm	25 ppm
STEL	35 ppm	35 ppm
IDLH	300 ppm	300 ppm

TLV-TWA (Threshold Limit Value – Time Weighted Average): The concentration for a normal 8 hour workday and a 40 hour work week, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.

STEL (Short Term Exposure Limit): The maximum concentration to which someone can safely be exposed for a period of up to 15 minutes – with a maximum of four periods per day.

IDLH (Immediately Dangerous to Life and Health): Any atmospheric condition that would cause an immediate threat to life OR cause permanent or delayed damage health effects OR interfere with an employee's ability to escape.

### 3.0 Site Description

**Company Name: Ocean Spray Cranberries**

**Address: 1480 State Route 105, Aberdeen, WA 98520**

**Company Contact Person: Cristian Dumitrescu, EHS Manager**

**Phone Numbers: Cell 360-589-0222; Desk 360-648-2541**

A map of the facility indicating the specific locations of the following can be found in Appendix C:

- Exits and doorways
- Ammonia sensors and ammonia remote displays
- Hazardous material storage
- Designated Safe Areas (Shelter-in-Place Procedure)
- Designated Assembly Areas
- Windsocks
- Emergency showers and eyewash stations

An ammonia system piping and valve diagram can be found in Appendix F and it is part of the site's Ammonia Refrigeration Management Program (ARM) which is maintained by the site engineering group. A hard copy of the ARM is located in the Engineering and Technical Services Manager office. An electronic copy of the ARM is located on the site's public shared drive P:\Engineering\ARM Program.

Adjacent land use includes:

- Light Industrial
- Other (wetlands, Grays Harbor Bay)

## **4.0 Pre-Emergency Planning**

### **4.1 Coordination with Employees**

In the event of an emergency, communication with employees will follow the Incident Command System. All communications shall take place through the *Emergency Coordinator*. Pre-emergency planning for facility personnel will include the appropriate training and drills to ensure that all employees know how to proceed should an emergency situation arise.

### **4.2 Coordination with Outside Parties**

Outside parties involved in the emergency response, such as Fire Departments and HAZMAT teams, will be invited to participate in pre-emergency planning, including drills, company safety events and facility tours. All expected roles, responsibilities, lines of authority and communications will be reviewed.

### **4.3 Drills**

Mock emergency drills will be held annually to ensure that all employees are familiar with their particular response actions. In addition, any plan elements requiring improvement will be identified. Drill records shall be maintained by the EHS Manager.

### **4.4 Plan Maintenance**

The following plan shall be maintained and updated, along with its supporting plans and operating procedures, as required. Following emergency response drills, amendments to the plan may be made in order to improve its effectiveness. If the list of emergency contacts or equipment/facility changes in design, the emergency response plan shall be immediately amended. The EHS Manager is responsible for publishing and distributing this ERP and will issue changes as required.

Diagrams indicating the location of the ammonia refrigeration equipment, the location of the ammonia refrigeration electrical equipment and a USGS topographic map showing the facility and surrounding area can be found in the Ammonia Refrigeration Management (ARM) Program which is maintained by the site engineering group. A hard copy of the ARM is located in the Engineering and Technical Services Manager office. An electronic copy of the ARM is located on the site's public shared drive P:\Engineering\ARM Program.

## **5.0 Personnel Roles, Lines of Authority, Training & Communication**

### **5.1 Incident Command System (ICS) Role Summaries**

#### **5.1.1 Emergency Coordinator**

- Senior emergency response official in charge of the site-specific incident. All emergency responders and their communications shall be coordinated and controlled through this individual.
- Initially the *Emergency Coordinator* will be the senior officer of the site, and with subsequent arrival of other senior plant or fire department officials (i.e. battalion chief, fire chief, site coordinator, etc.) the role will be passed up the line of authority as pre-established by this ERP.
- Have the ultimate responsibility for direction, control and coordination of the response effort
- Will assume control of the incident beyond the *First Responder Awareness Level*
- The Emergency Coordinator must be able to:
  - Implement the appropriate emergency operations
  - Ensure that the appropriate personal protective equipment (PPE) is worn for the hazards
  - Limit the number of emergency response personnel at the emergency site to those who are actively participating in emergency operations
  - Implement the appropriate decontamination procedures

#### **5.1.2 Hazardous Materials Technician (Offensive Response)**

- Enters the release area in accordance to this ERP
- Knowledge of PPE use and equipment available for HAZMAT response
- Knowledge of cleanup and decontamination procedures
- Understanding of chemical and toxicological properties of ammonia
- Responds to release or potential release, with the intent of stopping the release
- Are trained to approach the point of release offensively in order to either plug, patch or stop the release using other methods

#### **5.1.3 First Responder Operations Level (Defensive Response)**

- Approaches and assess ammonia releases using a full-face respirator and portable ammonia detector
- Knows how to distinguish between incidental and uncontrolled releases
- Can control a release from a safe distance
- Understands the limitations of the available tools and equipment
- Knows how to protect persons and property near the incident

- Respond to actual or potential releases in order to protect nearby persons, property, and/or the environment from the effects of the release
- Are trained to respond defensively, without trying to stop the release
- May try to confine the release from a safe distance, keep it from spreading and/or protect others from hazardous exposures
- Know basic hazard and risk assessment techniques
- Can select and use appropriate PPE
- Understand basic hazardous materials terms
- Can perform basic control, containment and/or confinement operations within the capabilities of the resources and PPE available
- Can implement decontamination procedures to their level training
- Understand relevant standard operating and termination procedures

#### **5.1.4 First Responder Awareness Level**

- Are likely to witness or discover a hazardous substance release
- Are trained to initiate an emergency response by notifying the proper authorities of the release
- Take no further action beyond notifying the authorities
- Understand what hazardous substances are and their associated risks
- Recognize the presence of hazardous substances in an emergency
- Understand the potential consequences of hazardous substances in an emergency

#### **5.1.5 Specialist Employee**

- Are a technical, medical, environmental, or other type of expert
- May be present at the scene or assist from an off-site location
- May represent a hazardous substance manufacturer, shipper or a government agency
- Regularly work with specific hazardous substances
- Are trained in the hazards of specific substances
- Are expected to give technical advice or assistance to the *Emergency Coordinator* when requested

**Table 2: Ocean Spray Cranberries Markham Plant Incident Command System**

	<b>Name</b>	<b>Plant #</b>	<b>Cell #</b>	<b>Home #</b>
<b>Emergency Coordinator #1</b>	Brett Insland, Plant Director	360-648-2513	903-335-0929	NA
<b>Emergency Coordinator #2</b>	Cristian Dumitrescu, EHS Manager	360-648-2541	360-589-0222	NA
<b>Emergency Coordinator #3</b>	Trevor Williams, Operations/Supply Chain Manager	360-648-2558	360-589-4384	NA
First Responder Awareness Level	All employees			
First Responder Operations Level	Engineering and Tech Services Manager  Qualified Trained Maintenance and Engineering Employees			
Response Team	Westport Fire Department  Cowlitz Clean Sweep, Inc.  Permacold Engineering	911  888-423-6316  425-678-8905		
Special Advisor	Permacold Engineering	425-678-8905		

## **5.2 Training**

### **5.2.1 New Employee Training**

All employees shall be trained on the duties and functions required for their assigned response position before they are permitted to participate in emergency operations. All new employees shall receive *First Responder – Awareness Level* training as part of their orientation.

The *First Responder – Awareness Level* training will consist of a minimum duration of 1 hour. The trainee will objectively demonstrate the competencies required by 1910.120(q)(6).

### **5.2.2 Initial Emergency Response Training**

Initial emergency response training shall consist of a minimum duration of 24 hours for the *Emergency Coordinator* and *Hazardous Materials Technician*, as well as 8 hours for the *First Responder – Operations Level*. Training duration also needs to be sufficient to provide the required competencies for *First Responder – Awareness Level*.

Any employees who may assist an outside party in the event of an emergency response shall undergo additional training. Additional training will include pre-emergency planning with the outside parties, as well as coordination with these parties during annual drills and any training events.

### **5.2.3 Refresher Training**

Annual refresher training shall be provided to all employees to ensure that they are able to maintain their competencies. Competency may be verified through exams, drills and/or demonstrations.

### **5.2.4 Ammonia Alarm Training**

Ocean Spray Markham has developed an in-house Ammonia Alarm System training. Appendix D is the training for the Ammonia System Alarm. All employees on site shall be trained upon hire and training shall be documented.

### **5.2.5 Training Records**

All training records shall be maintained by the EHS Manager. Documentation indicating the employee name, the type and duration of the training received, as well as how the level of understanding was verified shall be kept.

## 6.0 Emergency Recognition and Prevention

An ammonia release may be recognized by any one of the following manners:

- Automatic alarm sensors
- Portable ammonia monitors
- Verbal notification from facility personnel
- Characteristic odor or a visible cloud

### 6.1 Ammonia Alarm System

The ammonia alarm system control panel is located in the boiler room.

Signals from the ammonia alarm system will notify the following:

- Protection 1 (24 hour monitoring station)

TABLE 3: Ammonia Sensing Element Summary						
Channel	Sensor Location	Sensor Type & Model	Warn Set point	Warn Relay Output	Alarm Set point	Alarm Relay Output
1	PRV Vent Line	GG-VL-NH3	NA	NA	500 ppm	Supervisory Alarm to Fire Panel
2	Compressor Room	GG-NH3	NA	NA	25 ppm	Blue Strobe, Horn  Supervisory Alarm to Fire Panel
3	Compressor Room	GG-NH3	25 ppm	Exhaust Fan On	300 ppm	De-energize Solenoid Queen Valve
4	Compressor Room	GG-NH3-2%	NA	NA	500 ppm	Engine Room Equipment Shutdown  Trigger Evacuation Alarm

<b>TABLE 3: Ammonia Sensing Element Summary</b>						
5	Cooler	GG-NH3	NA	NA	25 ppm	Blue Strobe Horn Supervisory Alarm to Fire Panel
6	Third floor tank area	GG-NH3	NA	NA	25 ppm	Blue Strobe Horn Supervisory Alarm to Fire Panel
7	Freezer North end of Catwalk	GG-NH3	NA	NA	25 ppm	Blue Strobe Horn Supervisory Alarm to Fire Panel
8	Freezer South end of Catwalk	GG-NH3	NA	NA	25 ppm	Blue Strobe Horn Supervisory Alarm to Fire Panel

The ammonia alarm system is tested every six months; completion records will be retained by the Technical Services Manager.

## **6.2 Assessment**

Initial assessment of the ammonia release by the designated *First Responder - Operations Level*, equipped with a full-face respirator and portable ammonia monitor, will provide appropriate characteristics in order to determine whether the ammonia leak is found to be an emergency. A leak may be termed either an incidental release or an uncontrolled release (emergency):

### **6.2.1 Incidental Release**

An incidental release is a release that can be safely controlled at the time of the release and doesn't have the potential to become an uncontrolled release.

### **6.2.2 Uncontrolled Release**

An uncontrolled release is a release where significant safety and health risks could be created. Releases of hazardous substances that are either incidental or could not create a safety of health hazard (i.e. fire, explosion or chemical exposure) are not considered to be uncontrolled releases. Examples of conditions that could create a significant safety and health risk:

- Large quantity releases
- Small releases that could be highly toxic
- Potentially contaminated individuals arriving at hospitals
- Exposures that could exceed a concentration of 250ppm of ammonia
- Employees who aren't adequately trained or equipped to control the release.

## 7.0 Evacuation

### 7.1 Procedures

In case of an automatic or verbal ammonia alarm, the following evacuation procedures will be followed:

1. Evacuate the immediate area of the suspected leak and proceed to the primary assembly area (see Section 7.4) by following the safest and most appropriate emergency evacuation route (See Section 7.3), unless weather and release conditions prohibit doing so (see Shelter-in-Place, Section 7.5). **NOTE: Never enter a cloud or fog of ammonia.**
2. Immediately notify the **BOILER OPERATOR** on duty via the plant radio system or the plant paging system from any plant phone.
3. Notify the *Emergency Coordinator* if you have not already done so, and follow his/her subsequent instructions. The *Emergency Coordinator* will issue the facility wide evacuation if necessary.
4. Upon issuance of the evacuation warning, all employees will secure their work stations, turn off the lights, close doors and immediately proceed to the indicated assembly area.
5. Personnel shall report to their supervisor at the assembly area for accountability.
6. Isolate and deny site entry - exception of authorized emergency personnel.

### 7.2 Evacuation Notification

Notification to evacuate will be made by the following methods:

- The plant paging PA system allows for provision of detailed instructions, i.e. a "Shelter-in-Place" (assemble indoors) instruction or evacuate to the assembly areas outside.
- Activating the fire alarm system via pull station alerts all personnel to evacuate to the primary assembly area for their section of the facility.

### 7.3 Evacuation Routes

1. The main evacuation route is through the main hallway in the front office building.
2. The secondary evacuation routes are to the north and south of the facility, around the buildings.

NOTE: Employees should evacuate through the closest safe exit.

#### **7.4 Assembly Areas**

1. Front parking lot flagpole.
2. North gravel parking lot.
3. The *Emergency Coordinator* may appoint an appropriate alternative assembly area based on the emergency conditions, as well as wind and weather conditions. The assembly area should be away from and upwind of the release area.

A Markham Site Evacuation Plan can be found in Appendix C.

#### **7.5 Shelter-in-Place**

If it is determined by the *Emergency Coordinator* that it is safer for the employees to shelter-in-place, they will be directed by the *Emergency Coordinator* to proceed as follows:

1. Stay indoors and proceed to the closest designated safe room/area
2. Close all windows and doors, seal with duct tape or wet towels
3. Shut off furnace, exhaust fans and air conditioners, as well as any additional potential ignition sources
4. Wait for and follow advice from local police or authorities
5. If smell is very strong, breathe through a wet cloth

Pre-Designated Shelter-in-Place Areas:

1. Front office building.
2. Phillips Conference Room and adjacent offices.

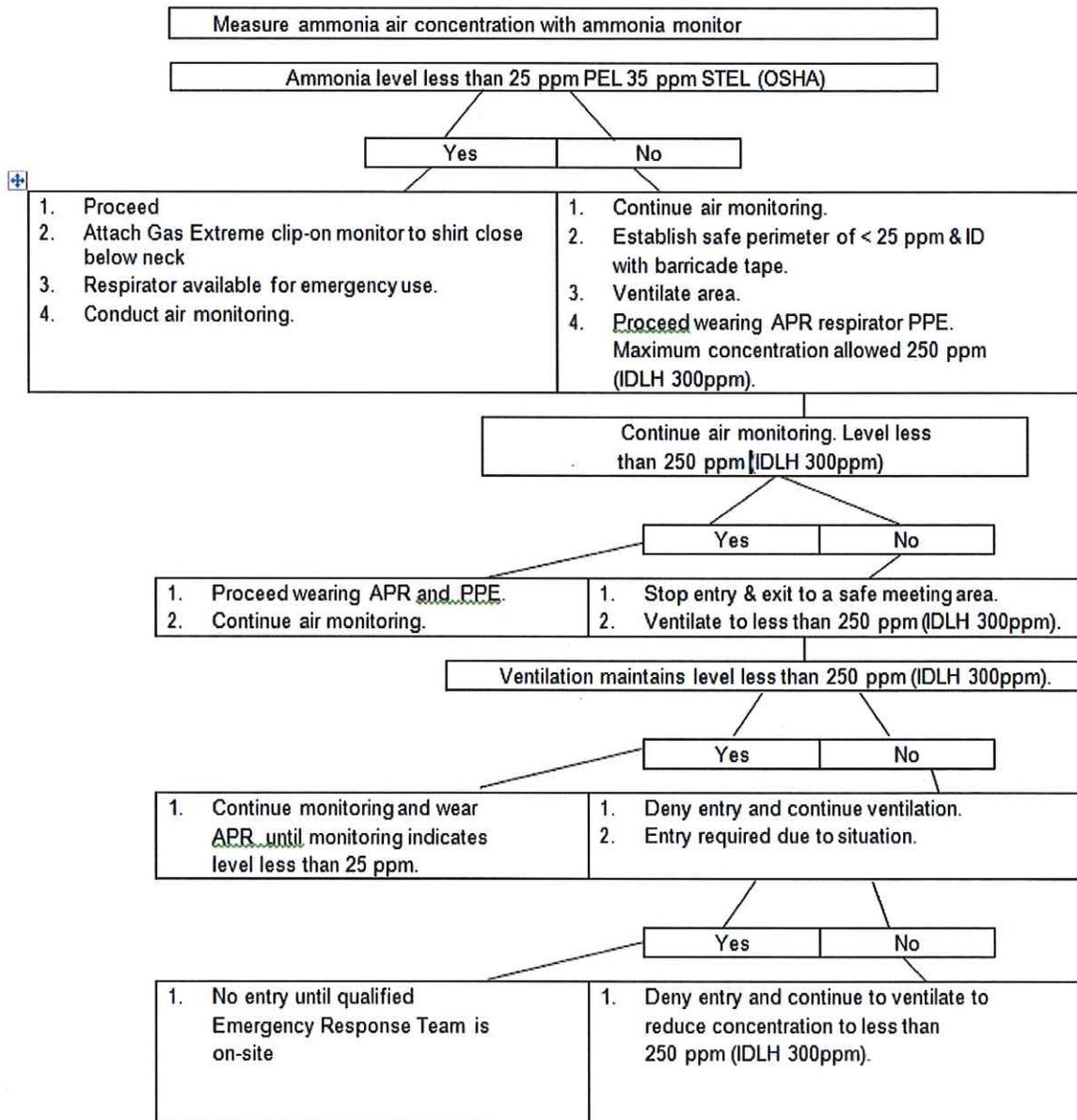
## 8.0 Active Response

Active response to ammonia leaks shall only be initiated if the individual may do so safely and can do so within the capabilities of their training. All efforts should be made to mitigate the release from outside of the affected space whenever possible. Ventilation will also be used to reduce inside ammonia concentrations. **All response activities shall be coordinated through the *Emergency Coordinator*.**

1. Account for all personnel.
2. Following the buddy system, a pair of *First Responders - Operations Level* will approach and assess the ammonia release equipped with a full face respirator with ammonia cartridges, ammonia resistant gloves, radio, an ammonia detector and tools necessary for mitigating a release. **NOTE: Ammonia readings should be taken en route to the reported area of release. If concentrations are found to be > 150ppm (at any time) and cannot be controlled through ventilation or other means of concentration reduction, the *First Responder - Operations Level* must immediately vacate the area and initiate the Uncontrolled Release Procedure.**
3. If the ammonia leak is determined to be an uncontrolled release or there is a potential for significant liquid contact, the **Uncontrolled Release Procedure** will be followed – see Section 8.2.

If the ammonia leak is determined to be an incidental release and the situation can be treated as a repair, the **Incidental Release Procedure** will be followed – see Section 8.1.

## GUIDELINES FOR ENTRY INTO KNOWN AMMONIA ENVIRONMENTS



**Table 4: Guidelines for entry into known ammonia environments**

## 8.1 Incidental Release Procedure

**NOTE: An incidental release is NOT an emergency response and does NOT activate the Emergency Response Plan.**

In the event of an incidental release the following procedures shall take place:

1. Ensure that the immediate release area has been evacuated, as per **Evacuation Procedures**. If the release exceeds an airborne concentration of ammonia of 150ppm, the entire facility shall additionally be evacuated.
2. Identify the source of the leak
3. Attempt to isolate the leak, as appropriate, by:
  - a. Closing valves to isolate smaller sections
  - b. Ventilating the area
  - c. Shutting down compressors, evaporators, or closing the King Valve

### **High Side (Liquid) Leaks**

1. Close closest upstream valve that can be accessed safely. If it cannot be accessed quickly, proceed to step 2.
2. Close King Valve
3. Shut down system
4. Consider securing ignition sources and/or ventilate the area

### **Low Side Leaks**

1. Ventilate the area
  2. Stop the supply of ammonia to the leak point. In most cases it would also be appropriate to stop the flow of liquid from the high-pressure receivers.
4. Water fog may be used to suppress airborne vapors from the leak or spill. **NOTE: Water should NOT be directed into spilled liquid as this may cause greater gasification.**
  5. After the leak has been controlled, decontamination procedures shall be followed and run-off water contained for later treatment.

### **Ammonia System Shut-Down procedures**

- Ocean Spray Cranberries, Inc. has established the following shutdown procedures. These procedures are maintained with the Ammonia Refrigeration Management (ARM) Program. These procedures can also be found in Appendix E of this plan.
  - SOP 8 Normal System Shutdown.
  - SOP 9 Long-Term Shutdown.

- SOP 10 System Emergency Shutdown
- After assessing conditions, establish safe places of refuge.
- To the extent possible, ensure plant is shut down and placed in a safe condition.

## **8.2 Uncontrolled Release**

**NOTE: All actions performed during an emergency response should be clearly documented on the Incident Summary Form (see attached).**

In the event of an uncontrolled release:

1. Call 911 (if you have not already done so) and notify any required additional parties.
2. Defensive actions, such as closing valves or pushing the emergency stop button to shut down Machine Room equipment, to mitigate or control the release that may be performed **outside** of the release area should be taken.
3. Await the arrival of the emergency response team and assist them as needed. The role of Emergency Coordinator shall be passed immediately upon their arrival.

## **8.3 Restoration**

Decontamination procedures shall consist of an initial water drench of contaminated equipment. The water drench should be performed in a contained area so that potentially contaminated water is controlled. Personnel performing the decontamination procedures should be equipped with a full-face respirator and gloves to avoid potential contact with residual ammonia. The decontamination shall be performed by a First Responder Operations Level (or above) trained employee. Additional washing and neutralization may be performed in order to prevent corrosion of equipment. Evaluation and proper disposal of any materials that might be hazardous waste, such as ammonia-saturated water, will also take place.

## **8.4 Critique of Response & Follow-Up**

Following an emergency response, the emergency response team shall meet to discuss their actions along with any recommendations for improving performance. A copy of the completed investigation report shall be reviewed at this time.

## 9.0 First Aid Measures

First aid assistance is to be provided as required by First Aid/CPR trained facility personnel or professional responders. Additional information can be found in the attached Safety Data Sheet for anhydrous ammonia (Appendix A).

First aid providers should wear approved full-face respirators with ammonia cartridges and gloves if there is any potential for contact with anhydrous ammonia while administering first aid.

Type of Exposure	Immediate Actions	Secondary Actions
Inhalation	Move victim to fresh air. Provide artificial respiration if breathing fails until victim regains consciousness. Oxygen may be administered by trained personnel.	Summon medical help. Keep victim quiet and maintain body temperature. Treat victim for shock. Perform CPR if there is no pulse.
Eyes	Immediately flush eyes with large amounts of water for more than 15-30 minutes. Hold eyelids while flushing. Remove contact lenses.	Summon medical help. Keep victim quiet and maintain body temperature. Treat victim for shock. Perform CPR if necessary.
Skin	Immediately flush skin with large amounts of running water for at least 15 minutes. Remove contaminated clothing and shoes. NOTE: Clothing may be frozen to skin. Clothing must be thoroughly thawed with water before removing. DO NOT use any burn creams. DO NOT bandage tightly.	Summon medical help. Keep victim quiet and maintain body temperature. Treat victim for shock. Perform CPR if necessary.
Ingestion	Seek medical attention immediately.	Summon medical help. Keep victim quiet and maintain body temperature. Treat victim for shock. Perform CPR if necessary.

A Site Emergency Equipment Map containing the location of all emergency eyewash and/or safety shower as well as first aid kits and AED locations can be found in Appendix C.

## 10.0 Medical Surveillance

Medical surveillance by a licensed practitioner shall be provided at no cost to the following employees:

- Any hazardous materials (HAZMAT) team members or hazardous materials specialists.
- Any emergency responder who shows immediate or delayed signs or symptoms possibly resulting from exposure to hazardous substances during an incident.
- Any employee who:
  - o May be injured.
  - o Shows immediate or delayed signs or symptoms possibly resulting from exposure to hazardous substances during an incident.
  - o May have been exposed to hazardous substances at concentrations above the permissible exposure limits (PELs) or the published exposure levels without PPE.

Standard medical surveillance will be provided as soon as possible following an incident or the development of symptoms of possible overexposure, as well as every twelve months thereafter unless a shorter or longer time frame is recommended by the physician. In addition, hazardous material team members or specialists shall receive a baseline physical examination prior to their initial assignment. Medical surveillance will also be provided at the termination of employment, unless the employee has been examined within the prior six months.

All medical surveillance records shall be maintained by the HR Department. Documentation indicating the employee name and social security number, physician's written opinions, recommended limitations, and results of examinations and tests, any employee medical complaints regarding hazardous substance exposures, as well as a copy of all information given to the examining physician shall be kept.

## **11.0 Personal Protective Equipment (PPE)**

The following section addresses general PPE requirements for dealing with an ammonia release. Separate PPE requirements for Respiratory Protection and Line Breaking are also addressed in the Respiratory Protection Program and Line Breaking Program.

### **11.1 Gloves & Clothing**

Skin contact with ammonia should be avoided. Protective gloves and chemical resistant clothing, including boots, pants, a protective slicker and a jacket made of rubber or another material that cannot be penetrated by ammonia should be worn. Clothing should be kept clean and free of oils and spills.

### **11.2 Eye Protection**

Safety glasses are worn when handling cylinders. During change-out or when exposure to gas is a risk, vapor-proof goggles and a face shield shall be worn. Contact lenses should not be worn by any employee when handling anhydrous ammonia.

### **11.3 Respiratory Protection**

Under routine exposures where the ambient concentration of ammonia exceeds 35 ppm, a NIOSH approved air purifying full-face respirator equipped with chemical cartridges appropriate for ammonia is required. For exposures of unknown concentrations of ammonia, such as uncontrolled releases, or those exceeding 250 ppm, only a positive pressure (pressure-demand) supplied air respirator with escape self-contained breathing apparatus (SCBA) is appropriate. Respirator use must be limited to individuals who have been medically cleared, adequately trained and fitted for the respirator face piece. Ocean Spray employees will evacuate any area with an ammonia concentration greater than 150ppm.

**NOTE: For large releases under emergency conditions, where contact with liquid anhydrous ammonia or high concentration gas is probable, chemical resistant, gastight totally encapsulating suits with 60 minute positive pressure SCBA are required.**

## 11.4 Emergency Response Equipment

Item	Location
Ammonia Cartridges, spare	EHS Office
Ammonia Monitor, Handheld	Boiler room
Batteries, D Cell	Parts Room
Eye Wash Bottles	Parts Room
Fans, Electric 110 V	Electricians Office – Confined Space Cart
Fans, Electric centrifugal w/ expandable ducting	Electricians Office – Confined Space Cart
Flashlight, sealed beam, D cell	Electricians Office – Confined Space Cart
Gloves, Rubber	Parts Room
Radios, FM frequency	All Maintenance, Supervisors, Select Operations employees
Raingear	Parts Room
Respirator, Full-Face, Ammonia Cartridges	Maintenance Supervisor Office
Safety Banner Tape	Maintenance Department
Saws, Hack	Parts Room
Straps, tie down	Electricians Office – Confined Space Cart
Tag Ropes	Electricians Office – Confined Space Cart
Tape, Duct	Maintenance Department
Wrenches, Crescent 8", 12"	Maintenance Department

# Ammonia, anhydrous

## Safety Data Sheet P-4562

according to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1981    Revision date: 03/23/2015    Supersedes: 01/06/2015

### SECTION 1: Product and company identification

#### 1.1. Product identifier

Product form : Substance  
 Name : Ammonia, anhydrous  
 CAS No : 7664-41-7  
 Formula : NH<sub>3</sub>

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Industrial use. Use as directed.

#### 1.3. Details of the supplier of the safety data sheet

Praxair, Inc.  
 39 Old Ridgebury Road  
 Danbury, CT 06810-5113 - USA  
 T 1-800-772-9247 (1-800-PRAXAIR) - F 1-716-879-2146  
[www.praxair.com](http://www.praxair.com)

#### 1.4. Emergency telephone number

Emergency number : Onsite Emergency: 1-800-645-4633

CHEMTREC, 24hr/day 7days/week — Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887 (collect calls accepted, Contract 17729)

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

##### Classification (GHS-US)

Liquefied gas H280  
 Acute Tox. 3 (Inhalation) H331  
 Skin Corr. 1B H314

#### 2.2. Label elements

##### GHS-US labeling

Hazard pictograms (GHS-US) :



Signal word (GHS-US) :

DANGER

Hazard statements (GHS-US) :

H221 - FLAMMABLE GAS  
 H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED  
 H331 - TOXIC IF INHALED  
 H314 - CAUSES SEVERE SKIN BURNS AND EYE DAMAGE  
 H400 - VERY TOXIC TO AQUATIC LIFE  
 CGA-HG22 - CORROSIVE TO THE RESPIRATORY TRACT

Precautionary statements (GHS-US) :

P202 - Do not handle until all safety precautions have been read and understood  
 P210 - Keep away from Heat, Open flames, Sparks, Hot surfaces. - No smoking  
 P260 - Do not breathe gas  
 P262 - Do not get in eyes, on skin, or on clothing.  
 P271+P403 - Use and store only outdoors or in a well-ventilated place.  
 P273 - Avoid release to the environment.  
 P280 - Wear protective gloves, protective clothing, eye protection, face protection  
 P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely  
 P381 - Eliminate all ignition sources if safe to do so  
 P501 - Dispose of contents/container in accordance with container supplier/owner instructions  
 CGA-PG05 - Use a back flow preventive device in the piping.

# Ammonia, anhydrous

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CGA-PG20+CGA-PG10 - Use only with equipment of compatible materials of construction and rated for cylinder pressure.

CGA-PG12 - Do not open valve until connected to equipment prepared for use.

CGA-PG06 - Close valve after each use and when empty.

CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F).

### 2.3. Other hazards

Other hazards not contributing to the classification : Contact with liquid may cause cold burns/frostbite.

### 2.4. Unknown acute toxicity (GHS US)

No data available

## SECTION 3: Composition/information on ingredients

### 3.1. Substance

Name	Product identifier	%
Ammonia, anhydrous (Main constituent)	(CAS No) 7664-41-7	100

### 3.2. Mixture

Not applicable

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

- First-aid measures after inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
- First-aid measures after skin contact : In case of contact, immediately flush affected areas with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before reuse. Discard contaminated shoes.
- First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately. Get immediate medical attention.
- First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

### 4.2. Most important symptoms and effects, both acute and delayed

No additional information available

### 4.3. Indication of any immediate medical attention and special treatment needed

Treat with corticosteroid spray as soon as possible after inhalation. Obtain medical assistance.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media : Carbon dioxide, Dry chemical, Water spray or fog.

### 5.2. Special hazards arising from the substance or mixture

Reactivity : No reactivity hazard other than the effects described in sub-sections below.

### 5.3. Advice for firefighters

- Firefighting instructions : Take care not to extinguish flames. If flames are accidentally extinguished, explosive re-ignition may occur. Allow fire to burn out.
- Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.
- Protection during firefighting : Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen.
- Special protective equipment for fire fighters : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus. Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.

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### Other information

: Heat of fire can build pressure in cylinder and cause it to rupture. No part of a cylinder should be subjected to a temperature higher than 125°F (52°C). Cylinders are equipped with a pressure-relief device. (Exceptions may exist where authorized by DOT, in this case where cylinders contain less than 165 pounds of product.) If leaking or spilled product catches fire, do not extinguish flames. Flammable and toxic vapors may spread from leak and could explode if reignited. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering area, especially confined areas, check atmosphere with an appropriate device. Reverse flow into cylinder may cause rupture. To protect persons from cylinder fragments and toxic fumes if a rupture occurs, totally evacuate the area if the fire cannot be brought under immediate control.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

#### General measures

: Evacuate personnel to a safe area. Appropriate self-contained breathing apparatus may be required. Approach suspected leak area with caution. Remove all sources of ignition. If safe to do so. Reverse flow into cylinder may cause rupture. Reduce gas with fog or fine water spray. Stop flow of product if safe to do so. Ventilate area or move container to a well-ventilated area. Flammable gas may spread from leak. Before entering the area, especially a confined area, check the atmosphere with an appropriate device.

#### 6.1.1. For non-emergency personnel

No additional information available

#### 6.1.2. For emergency responders

No additional information available

### 6.2. Environmental precautions

Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

### 6.3. Methods and material for containment and cleaning up

No additional information available

### 6.4. Reference to other sections

See also sections 8 and 13.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

#### Precautions for safe handling

: Do not breathe gas/vapor. Avoid all contact with skin, eyes, or clothing. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only non-sparking tools. Use only explosion-proof equipment.

Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

# Ammonia, anhydrous

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### 7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a cool, well-ventilated place. Store and use with adequate ventilation. Store only where temperature will not exceed 125°F (52°C). Firmly secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods.

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

### 7.3. Specific end use(s)

None.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

Ammonia, anhydrous (7664-41-7)		
ACGIH	ACGIH TLV-TWA (ppm)	25 ppm
ACGIH	ACGIH TLV-STEL (ppm)	35 ppm
USA OSHA	OSHA PEL (TWA) (mg/m <sup>3</sup> )	35 mg/m <sup>3</sup>
USA OSHA	OSHA PEL (TWA) (ppm)	50 ppm

### 8.2. Exposure controls

Appropriate engineering controls : Use a local exhaust system, if necessary, to prevent oxygen deficiency and to keep hazardous fumes and gases below all applicable limits in the worker's breathing zone. **MECHANICAL ENGINEERING CONTROLS:** Not recommended as a primary ventilation system to control worker's exposure. **USE ONLY IN A CLOSED SYSTEM.** An explosion-proof, corrosion-resistant, forced-draft fume hood is preferred.

Personal protective equipment : Wear metatarsal shoes and work gloves for cylinder handling, and protective clothing where needed. Wear appropriate chemical gloves (e.g. neoprene, nitrile, etc.) during cylinder changeout or wherever contact with product is possible. Select per OSHA 29 CFR 1910.132, 1910.136, and 1910.138.

Eye protection : Wear safety glasses when handling cylinders; vapor-proof goggles and a face shield during cylinder changeout or whenever contact with product is possible. Select eye protection in accordance with OSHA 29 CFR 1910.133.

Skin and body protection : Wear metatarsal shoes and work gloves for cylinder handling, and protective clothing where needed. Wear appropriate chemical gloves (e.g. neoprene, nitrile, etc.) during cylinder changeout or wherever contact with product is possible. Select per OSHA 29 CFR 1910.132, 1910.136, and 1910.138.

Respiratory protection : When workplace conditions warrant respirator use, follow a respiratory protection program that meets OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable). Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure (e.g., an organic vapor cartridge). For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

Thermal hazard protection : Wear cold insulating gloves when transfilling or breaking transfer connections.

Environmental exposure controls : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

Other information : Keep suitable chemically resistant protective clothing readily available for emergency use. Wear leather safety gloves and safety shoes when handling cylinders.

# Ammonia, anhydrous

## Safety Data Sheet P-4562

according to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1981    Revision date: 03/23/2015    Supersedes: 01/06/2015

### SECTION 9: Physical and chemical properties

#### 9.1. Information on basic physical and chemical properties

Physical state	: Gas
Appearance	: Colorless gas. Liquid under pressure.
Molecular mass	: 17 g/mol
Color	: Colorless.
Odor	: Ammoniacal.
Odor threshold	: No data available
pH	: Not applicable.
Relative evaporation rate (butyl acetate=1)	: No data available
Relative evaporation rate (ether=1)	: Not applicable.
Melting point	: -77.7 °C
Freezing point	: No data available
Boiling point	: -33 °C
Flash point	: No data available
Critical temperature	: 132 °C
Auto-ignition temperature	: 650 °C
Decomposition temperature	: No data available
Flammability (solid, gas)	: ≥ 16 vol % 25
Vapor pressure	: 860 kPa
Critical pressure	: 11350 kPa
Relative vapor density at 20 °C	: No data available
Relative density	: 0.7
Density	: 0.682 g/cm <sup>3</sup> (at -33 °C)
Relative gas density	: 0.6
Solubility	: Water: 517000 mg/l
Log Pow	: Not applicable.
Log Kow	: Not applicable.
Viscosity, kinematic	: Not applicable.
Viscosity, dynamic	: Not applicable.
Explosive properties	: Not applicable.
Oxidizing properties	: None.
Explosion limits	: No data available

#### 9.2. Other information

Gas group	: Liquefied gas
Additional information	: None.

### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

#### 10.2. Chemical stability

Stable under normal conditions.

#### 10.3. Possibility of hazardous reactions

Hazardous reactions may occur on contact with certain chemicals. (Refer to the list of incompatible materials section 10: "Stability-Reactivity").

#### 10.4. Conditions to avoid

Avoid moisture in installation systems.

# Ammonia, anhydrous

## Safety Data Sheet P-4562

according to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1981 Revision date: 03/23/2015 Supersedes: 01/06/2015

### 10.5. Incompatible materials

Gold, silver, mercury, Oxidizing agents, Halogens, Halogenated compounds, Acids, Copper, Zinc, Copper/Zinc alloys (Brass), Chlorates.

### 10.6. Hazardous decomposition products

The normal products of combustion are nitrogen and water. Hydrogen may be formed at temperatures above 1,544°F (840°C).

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity : Inhalation: TOXIC IF INHALED.

Ammonia, anhydrous ( 7664-41-7)	
LC50 inhalation rat (ppm)	7338 ppm/1h
ATE US (gases)	700.000 ppmV/4h
ATE US (vapors)	3.000 mg/l/4h
ATE US (dust, mist)	0.500 mg/l/4h

Skin corrosion/irritation : CAUSES SEVERE SKIN BURNS AND EYE DAMAGE.

pH: Not applicable.

Serious eye damage/irritation : Not classified

pH: Not applicable.

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

## SECTION 12: Ecological information

### 12.1. Toxicity

Ecology - general : VERY TOXIC TO AQUATIC LIFE. No ecological damage caused by this product.

Ammonia, anhydrous (7664-41-7)	
LC50 fish 1	0.44 mg/l (Exposure time: 96 h - Species: Cyprinus carpio)
EC50 Daphnia 1	25.4 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC50 fish 2	0.26 - 4.6 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus)

### 12.2. Persistence and degradability

Ammonia, anhydrous (7664-41-7)	
Persistence and degradability	The substance is biodegradable. Unlikely to persist.

### 12.3. Bioaccumulative potential

Ammonia, anhydrous (7664-41-7)	
Log Pow	Not applicable.
Log Kow	Not applicable.
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.

### 12.4. Mobility in soil

Ammonia, anhydrous (7664-41-7)	
Mobility in soil	No data available.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

# Ammonia, anhydrous

## Safety Data Sheet P-4562

according to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

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### 12.5. Other adverse effects

- Other adverse effects : May cause pH changes in aqueous ecological systems.
- Effect on ozone layer : None.
- Effect on the global warming : No known effects from this product.

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

- Waste disposal recommendations : Do not attempt to dispose of residual or unused quantities. Return container to supplier.

## SECTION 14: Transport information

In accordance with DOT

- Transport document description : UN1005 Ammonia, anhydrous, 2.2
- UN-No.(DOT) : UN1005
- Proper Shipping Name (DOT) : Ammonia, anhydrous
- Department of Transportation (DOT) Hazard Classes : 2.2 - Class 2.2 - Non-flammable compressed gas 49 CFR 173.115
- Hazard labels (DOT) : 2.2 - Non-flammable gas



- DOT Symbols : D - Proper shipping name for domestic use only, or to and from Canada
- DOT Special Provisions (49 CFR 172.102) : 13 - The words Inhalation Hazard shall be entered on each shipping paper in association with the shipping description, shall be marked on each non-bulk package in association with the proper shipping name and identification number, and shall be marked on two opposing sides of each bulk package. Size of marking on bulk package must conform to 172.302(b) of this subchapter. The requirements of 172.203(m) and 172.505 of this subchapter do not apply. T50 - When portable tank instruction T50 is referenced in Column (7) of the 172.101 Table, the applicable liquefied compressed gases are authorized to be transported in portable tanks in accordance with the requirements of 173.313 of this subchapter.
- Marine pollutant : Yes



### Additional information

- Emergency Response Guide (ERG) Number : 125 (UN1005);154 (UN2672)
- Other information : No supplementary information available.
- Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers:
  - Ensure there is adequate ventilation.
  - Ensure that containers are firmly secured.
  - Ensure cylinder valve is closed and not leaking.
  - Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
  - Ensure valve protection device (where provided) is correctly fitted.

### Transport by sea

- UN-No. (IMDG) : 1005
- Proper Shipping Name (IMDG) : AMMONIA, ANHYDROUS
- Class (IMDG) : 2 - Gases
- MFAG-No : 125



# Ammonia, anhydrous

## Safety Data Sheet P-4562

according to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

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### Air transport

UN-No.(IATA)	: 1005
Proper Shipping Name (IATA)	: Ammonia, anhydrous
Class (IATA)	: 2
Civil Aeronautics Law	: Gases under pressure/Gases toxic under pressure

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

Ammonia, anhydrous (7664-41-7)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory		
Listed on the United States SARA Section 302		
Listed on United States SARA Section 313		
SARA Section 302 Threshold Planning Quantity (TPQ)	500	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard Delayed (chronic) health hazard Sudden release of pressure hazard Fire hazard	
SARA Section 313 - Emission Reporting	1.0 % (includes anhydrous Ammonia and aqueous Ammonia from water dissociable Ammonium salts and other sources, 10% of total aqueous Ammonia is reportable under this listing)  Chemical(s) subject to the reporting requirements of Section 313 or Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372.	
Ammonia, anhydrous	CAS No 7664-41-7	100%

### 15.2. International regulations

#### CANADA

Ammonia, anhydrous (7664-41-7)
Listed on the Canadian DSL (Domestic Substances List)

#### EU-Regulations

Ammonia, anhydrous (7664-41-7)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

### 15.2.2. National regulations

Ammonia, anhydrous (7664-41-7)
Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Japanese Poisonous and Deleterious Substances Control Law
Listed on the Canadian IDL (Ingredient Disclosure List)

### 15.3. US State regulations

Ammonia, anhydrous(7664-41-7)	
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No

# Ammonia, anhydrous

## Safety Data Sheet P-4562

according to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

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Ammonia, anhydrous(7664-41-7)	
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List U.S. - Pennsylvania - RTK (Right to Know) List

California Proposition 65 - This product contains, or may contain, trace quantities of a substance(s) known to the state of California to cause cancer and/or reproductive toxicity

### SECTION 16: Other information

Revision date : 3/23/2015 12:00:00 AM

Other information : When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product.

Praxair asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.

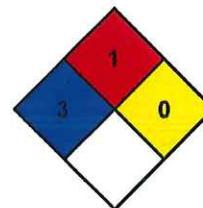
Praxair SDSs are furnished on sale or delivery by Praxair or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your Praxair sales representative, local distributor, or supplier, or download from [www.praxair.com](http://www.praxair.com). If you have questions regarding Praxair SDSs, would like the document number and date of the latest SDS, or would like the names of the Praxair suppliers in your area, phone or write the Praxair Call Center (Phone: 1-800-PRAXAIR/1-800-772-9247; Address: Praxair Call Center, Praxair, Inc., P.O. Box 44, Tonawanda, NY 14151-0044).

PRAXAIR and the Flowing Airstream design are trademarks or registered trademarks of Praxair Technology, Inc. in the United States and/or other countries.

NFPA health hazard : 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

NFPA fire hazard : 1 - Must be preheated before ignition can occur.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



### HMIS III Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

Flammability : 1 Slight Hazard

Physical : 2 Moderate Hazard

SDS US (GHS HazCom 2012) - Praxair

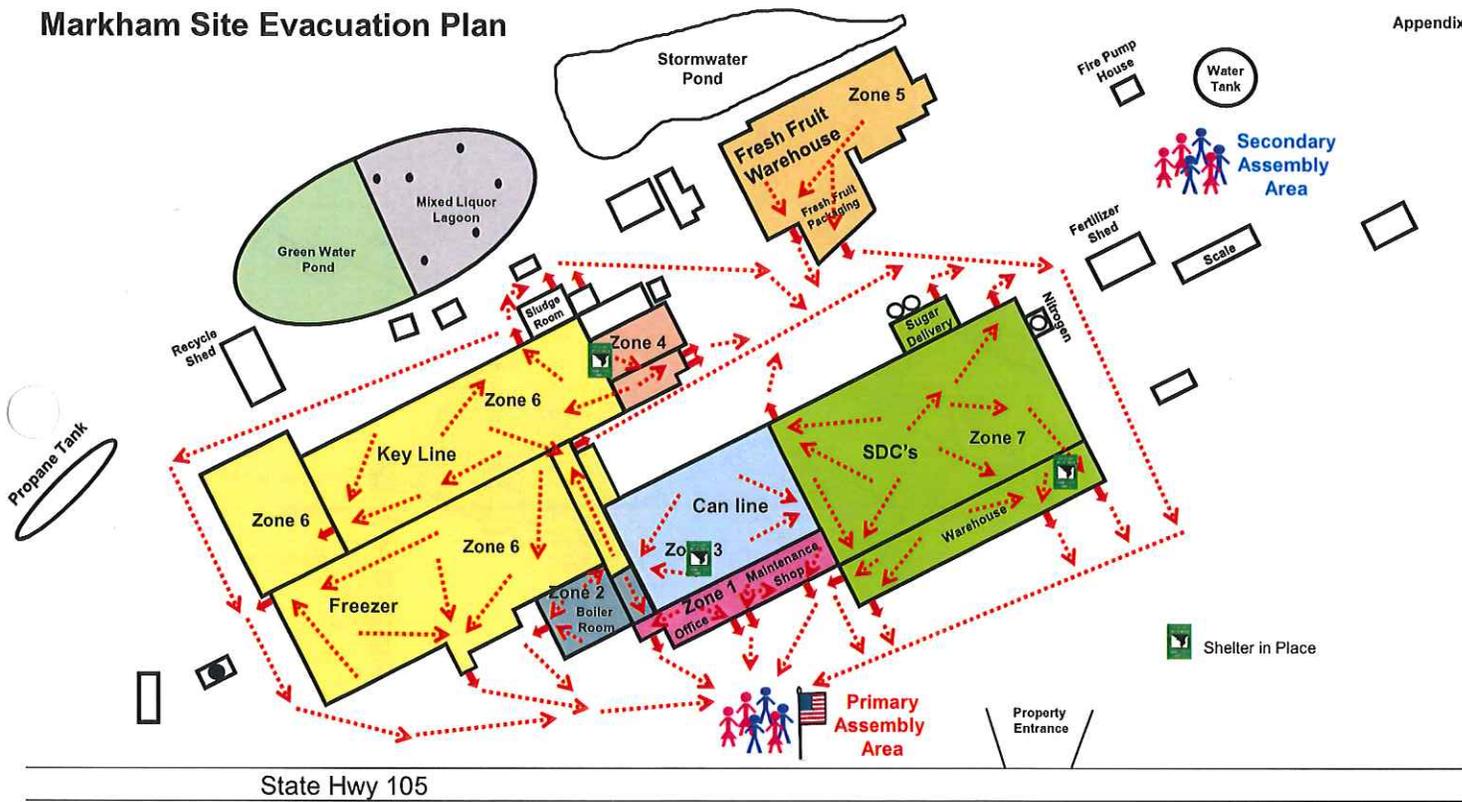
*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*

## Appendix B

<b>External Emergency Notification List</b>				
Organization	Criteria	Telephone	Night/Cell Phone	Time Contacted
<b>Local Law Enforcement</b>	Call to report any emergency or release with offsite consequences	<b>911</b>		
<b>Local Fire Department/Emergency Medical Services</b>	Call to report any emergency or release with offsite consequences	<b>911</b>		
<b>Washington Department of Labor &amp; Industries (DOSH)</b>	Call to report a death or hospitalization	<b>1-800-423-7233</b>		
<b>Washington Department of Ecology</b>	Call to report any release of ammonia into water or air	<b>1-800-424-8802 AND 1-800-258-5990</b>		
<b>Primary Agency Contact (Refrigeration Contractor)</b>	Permacold Engineering	425-678-8905		
<b>Hazmat Hotline</b>	Cowlitz Clean Sweep, Inc.	1-888-423-6316(24hr.)	360-532-4309	
<b>Required Notifications for Releases Over 100 pounds</b>				
<b>National Response Center (NRC)</b>	Call to report a release of over 100 lbs (Call within 15 mins of ensuring life/safety)	800-424-8802  202-267-2675		
<b>State Emergency Response Commission (SERC)</b>	Call to report a release of over 100 lbs (Call within 15 mins of ensuring life/safety)	360-407-6729		
<b>Local Emergency Planning Committee (LEPC)</b>	Call to report a release of over 100 lbs (Call within 15 minutes)	360-249-3911 ext 292		

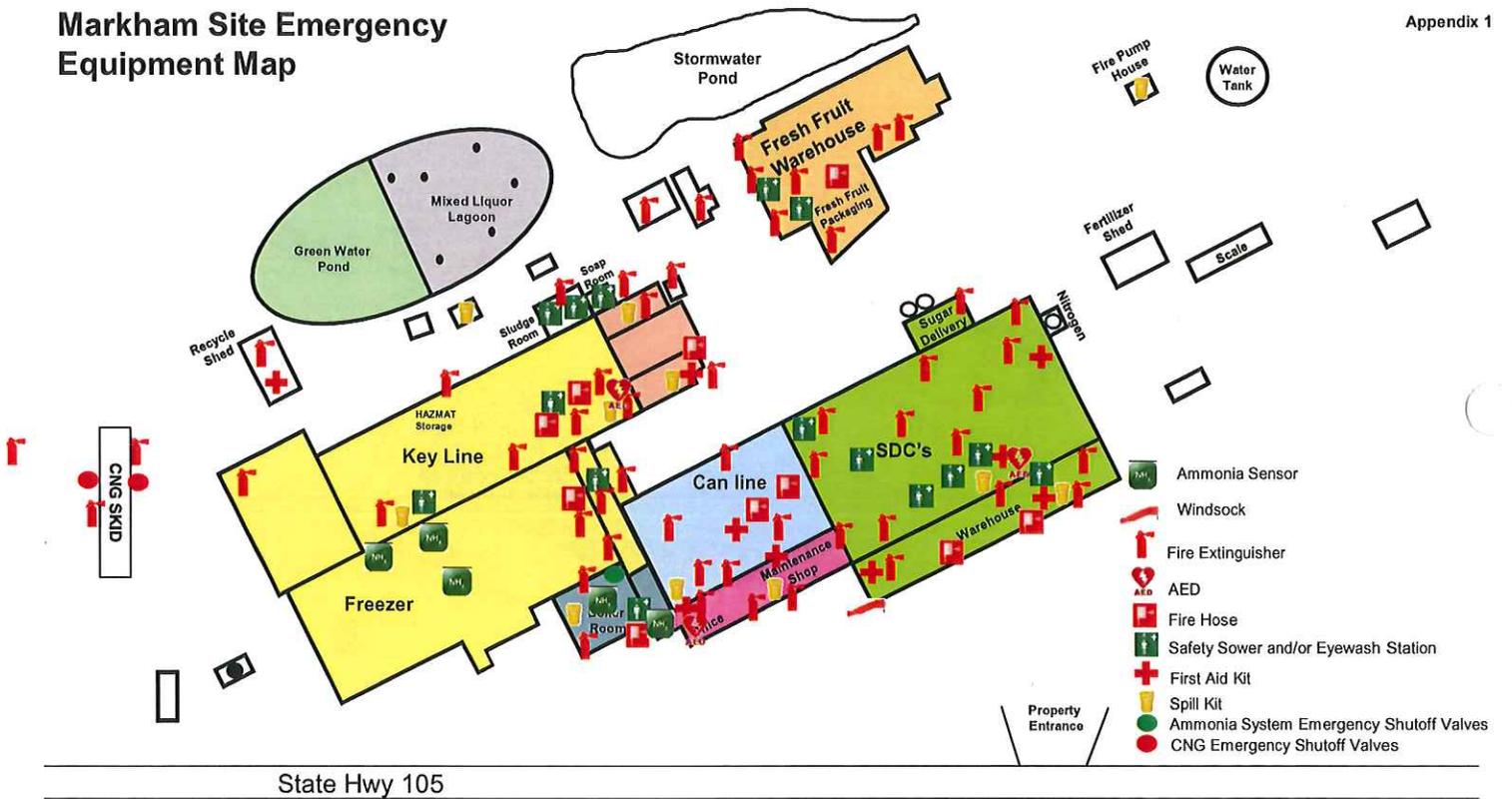
# Markham Site Evacuation Plan

Appendix 1



# Markham Site Emergency Equipment Map

Appendix 1



State Hwy 105

# Ammonia Alarm Awareness



**Anhydrous Ammonia**

**HEALTH HAZARD**

- 4: Deadly
- 3: Extreme Danger
- 2: Hazardous
- 1: Slightly Hazardous
- 0: Normal Material

**FIRE HAZARD Flash Points:**

- 4: Below 72° F
- 3: Below 100° F
- 2: Below 200° F
- 1: Above 200° F
- 0: Not Flammable

**SPECIFIC HAZARD**

- OX: Oxidizer
- AL: Alkali
- W: Water Reactive
- AC: Acid
- CC: Corrosive
- FC: Flammable Gas
- FL: Flammable Liquid
- PO: Poisonous
- SI: Simple Asphyxiant

**INSTABILITY**

- 1: May Detonate
- 2: May Be Detonated
- 3: May Be Detonated by Heat
- 4: May Be Detonated by Heat
- 0: Stable

**PROTECTIVE EQUIPMENT FOR HANDLING MATERIALS**

Aprons, Boots, Face Mask, Gloves, Goggles

**Precautionary Measures:**  
Avoid inhalation and exposure to skin. Keep container closed. Use only with adequate ventilation to maintain airborne concentration below hazardous levels. Wear appropriate gloves, goggles, and personal protective clothing.

**Emergency Overview:**  
Colorless gas/liquid with a strong, suffocating odor. Causes skin, eye and respiratory tract burns. May cause blindness. Exposure to high levels may be fatal. Potential explosion hazard in confined spaces. Use sufficient ventilation to prevent vapor build-up.

**First Aid Procedures:**  
Inhalation: Remove to fresh air. Ejection: Flush with fanning amounts of water for at least 15 min. Irrigation: Irrigation of gas is unlikely. For aqueous solutions, do not induce vomiting. If conscious, give large amounts of water to drink. If unconscious, do not give anything by mouth.

## Session Objectives

- You will be able to:
  - Understand the general hazards of ammonia
  - How we use ammonia at Ocean Spray's Markham Plant
  - Where alarms are located and how they look/sound at the Plant
  - What to do when you hear or see an alarm
  - Where to Evacuate in the event of an ammonia release or emergency



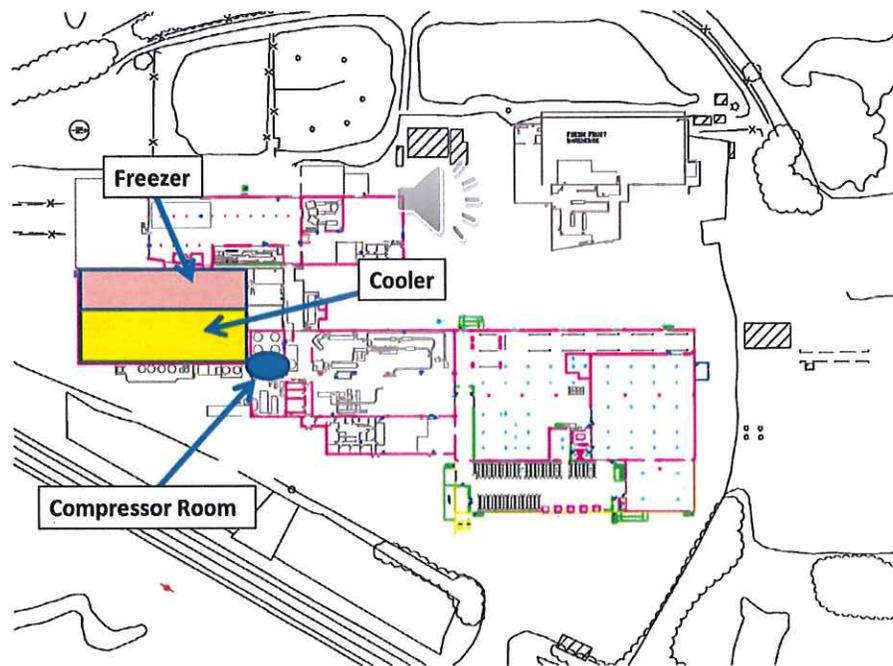
## Ammonia Hazard

- Ammonia is a colorless gas with a sharp, penetrating, intensely irritating odor (like cat urine)
- At high pressure it converts from a gas to a liquid
- Ammonia is able to be smelled at a concentration of between 1 to 20 parts per million (ppm)
- A 10-minute exposure to 30 ppm may be faintly irritating to some, while 50 ppm may be found to be moderately irritating by most.
- A 5-minute exposure of ~100 ppm will cause irritation of the nose and throat for most people.
- At 500 ppm, immediate and severe irritation of nose, and throat occurs.
- At concentrations of 1,500 ppm, loss of consciousness can occur

## Ammonia at Ocean Spray's Markham Plant

- Used as a Refrigerant to keep the binned cranberries preserved
- The ammonia system is designed to be a closed loop system:
  - Liquid ammonia flows from the compressor room to the cooler and freezer.
  - As it flows through the cooler and freezer in pipes, it absorbs the relatively warmer air around it, and changes from a liquid to a gas.
  - It then flows back to the compressor room where it is pressurized back into a liquid and process is repeated.
- When there is a leak in the closed loop system, ammonia escapes and an alarm will sound
- Do not step on ammonia pipes; do not lean ladders against ammonia pipes.

# Ammonia at Ocean Spray's Markham Plant



## Ammonia Warning Alarms/Lights

- Maintenance Warning Lights (no audible alarm)
- Located to the right of the inside door of the Ammonia Compressor Room
- Blinking Light
- As the sign indicates, if you see the light blinking, please call the maintenance supervisor (extension 535)



# Ammonia Warning Alarms/Lights



# Ammonia Gas Release Alarm #1

- Release of Ammonia Gas inside the Cooler or the Freezer
- Concentration exceeds 40 parts per million
- Blue blinking light and audible alarm above the door to the cooler, the doors to the freezer, and outside the door to the Sauce Lab
- Notify Maintenance Supervisor to investigate the leak.



Ammonia Alarm above the Cooler doorway



## Ammonia Gas Release Alarm #2



Ammonia  
Alarm



Ammonia  
Alarm above  
the left  
Freezer  
doorway



## Ammonia Gas Release Alarm #3



Ammonia  
Alarm



Ammonia  
Alarm to the  
left of the  
right Freezer  
doorway



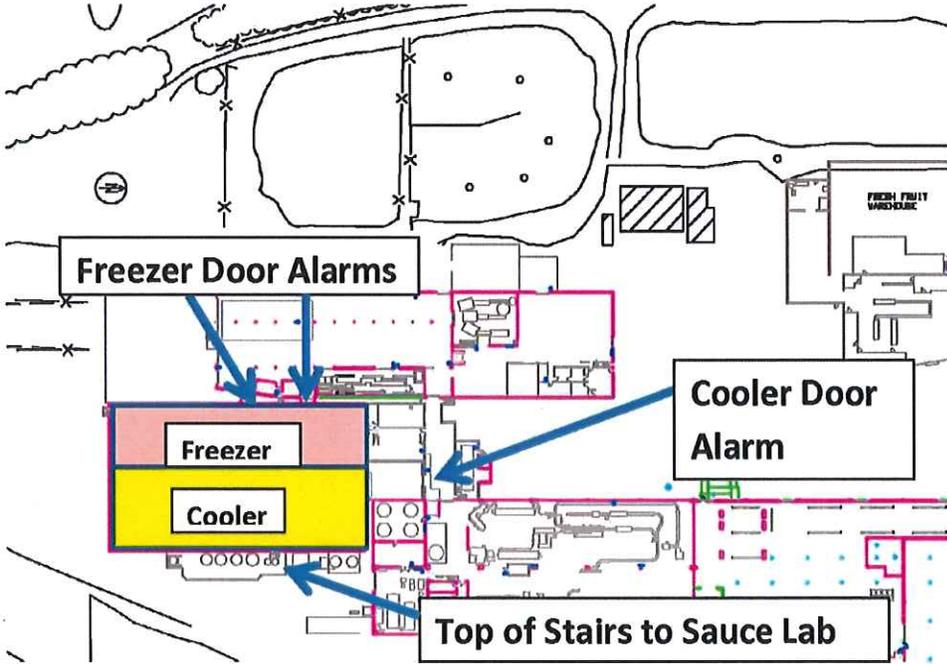
## Ammonia Gas Release Alarm #4



Ammonia  
Alarm

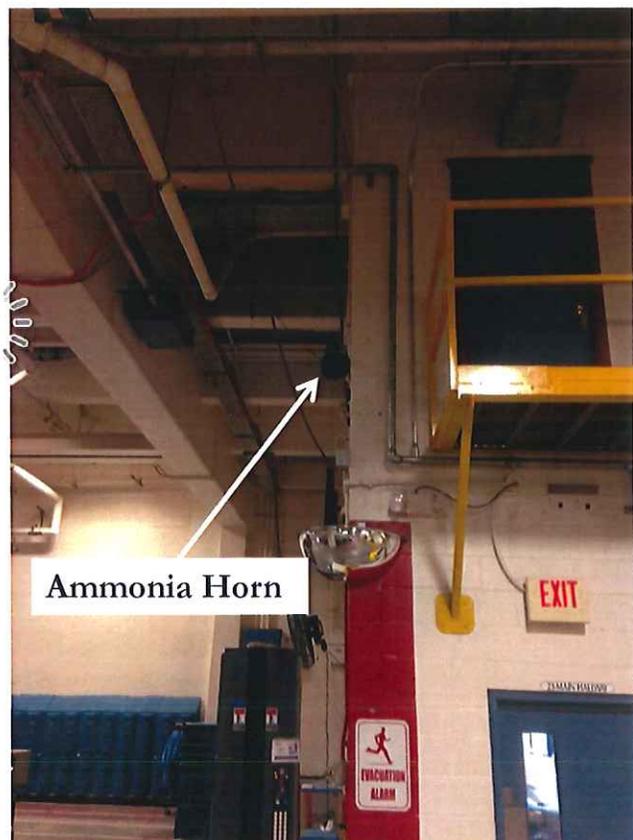
Ammonia Alarm at the top of  
the Stairs of the Sauce Lab

# Ammonia at Ocean Spray's Markham Plant

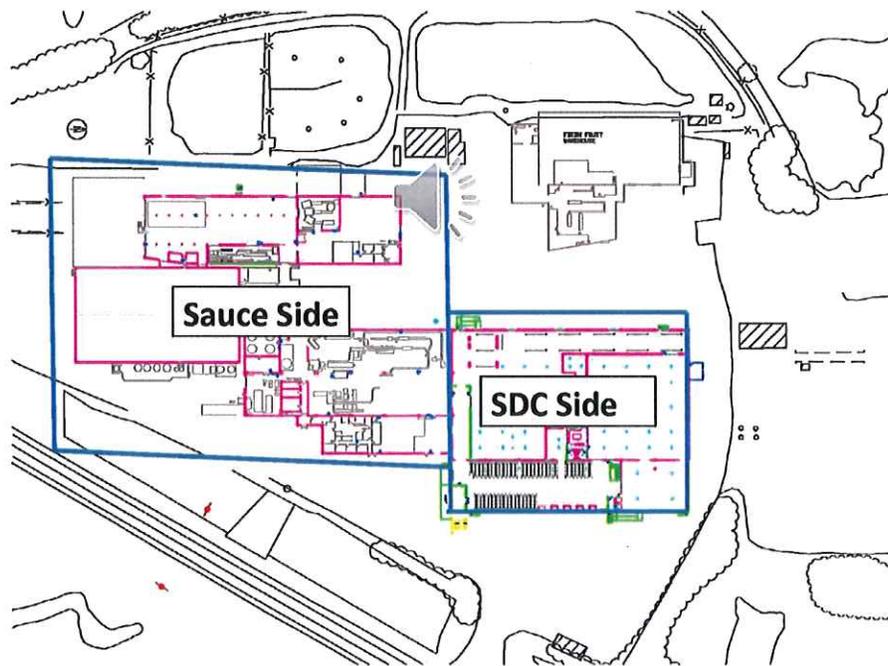


## Ammonia Gas Release Alarm

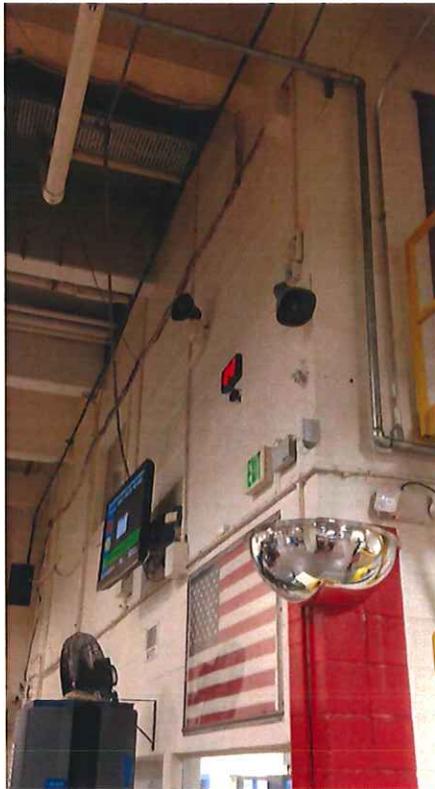
- Release of Ammonia Gas inside the Compressor Room
- Ammonia Concentration exceeds 150 parts per million
- Horn will Sound on the Sauce Side of the Plant
- Evacuation Required
- Maintenance Supervisor to set off Evacuation alarm on the SDC Side of the Plant and notify Wastewater personnel.



# Ammonia Alarms at Ocean Spray's Markham Plant



# Ammonia Gas Release Alarm



## Evacuation Alarm – SDC Side



# Evacuation Alarm – SDC Side



## Evacuation Alarm – SDC Side

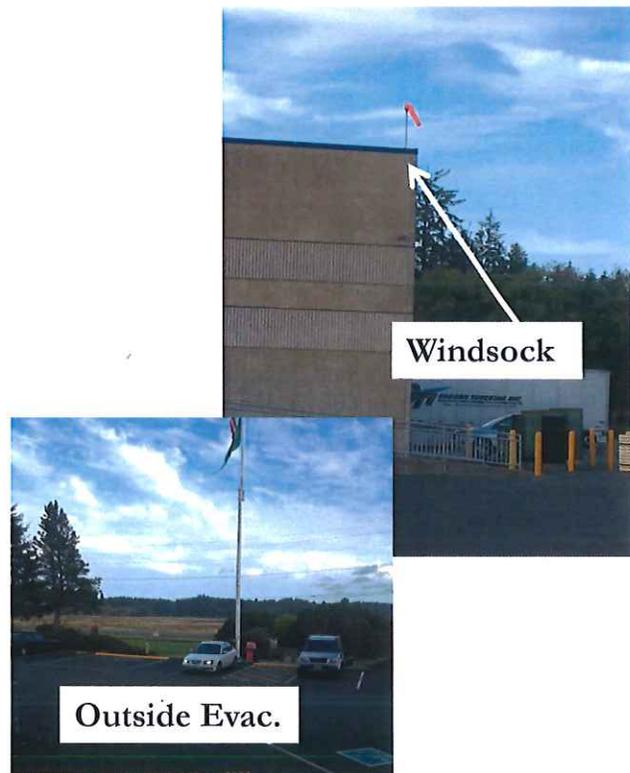


# Evacuation Alarm – SDC Side

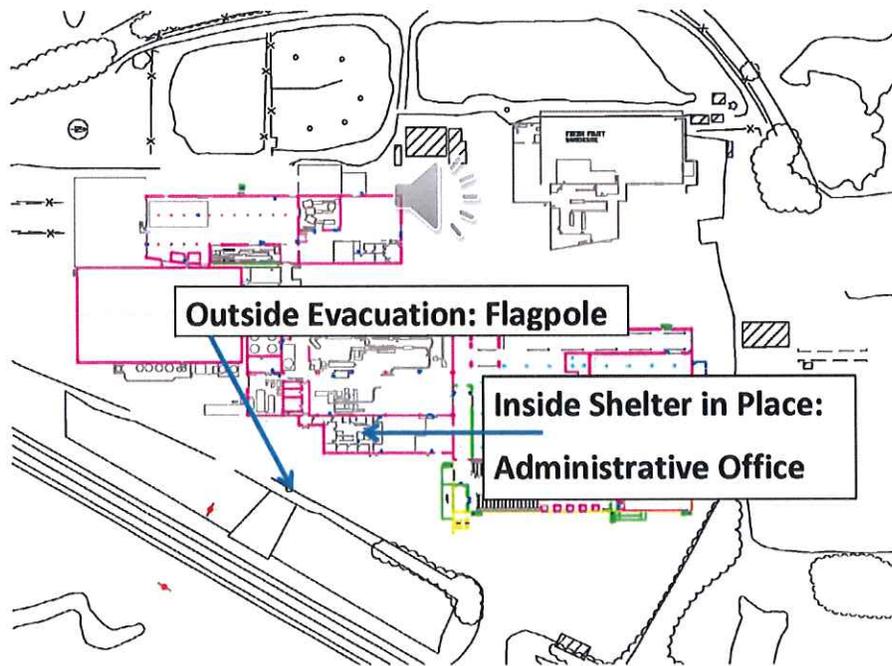


## Evacuation – to Where?

- The location of the release and the wind direction will dictate where to evacuate
- Windsocks are used at the Plant to indicate wind direction.
- Outside Evacuation Point: Normally the Flagpole
- Inside Evacuation Point: Administrative Office
- Await direction from your supervisor



# Evacuation Locations





**NORMAL SYSTEM SHUTDOWN**

**NOTICE**

Do not perform any procedure without full understanding of related components, associated hazards, and relevant system information. You may need to consult other sources such as system drawings, owner's manuals, cut sheets, schematics, etc., for information needed to safely complete the task. Only trained and authorized personnel may work on the system. Any non-routine task will be performed under the direct supervision of the Engineering Manager. **Shutdown should only be performed by a trained person very familiar with the operation of the system.**

**Normally the system is never shut down unless for major maintenance. Prior to shutdown, determine the reason for shutdown. This will dictate the shutdown procedures.**

**PREPARATION FOR SHUTDOWN**

- The High Pressure Receiver (HPR) may not be filled to over 80% of capacity in order to leave room for expansion during the shutdown.
- Monitor all pressures, temperatures, and levels while the system is shut down.
- Component specific shutdown procedures may be found in the manufacturer's operating manuals.

**PROCEDURES**

1. Note the liquid level in all pressure vessels.
2. Ensure the HPR has adequate room for liquid to be stored.
3. Freezer Air Units and the LPR are to remain in operation at all times unless long term shutdown occurs.

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**LONG-TERM SHUTDOWN**

**NOTICE**

Do not perform any procedure without full understanding of related components, associated hazards, and relevant system information. You may need to consult other sources such as system drawings, owner's manuals, cut sheets, schematics, etc., for information needed to safely complete the task. Only trained and authorized personnel may work on the system. Any non-routine task will be performed under the direct supervision of the Engineering Manager. **Long-term Shutdown should only be performed by a trained person very familiar with the operation of the system.**

**The only time a Long-term shutdown would occur would be if the plant was closing down. It is recommended that ammonia be removed from the system if it is going into long-term shutdown.**

**PREPARATION FOR SHUTDOWN**

- The High Pressure Receiver (HPR) may not be filled to over 80% of capacity in order to leave room for expansion during the shutdown. It may be necessary to temporarily store ammonia in portable ammonia cylinders, or to pump out ammonia that cannot be stored in the HPR to an ammonia truck in order to ensure a full pump down while not overfilling the HPR.
- Component specific shutdown procedures may be found in the manufacturer's operating manuals.
- Long-term shutdown only occurs under the direct supervision of the Engineering Manager.
- Monitor all pressures, temperatures, and levels during the procedure and while the system is shut down.

**PROCEDURES**

1. Note the liquid level in all pressure vessels.
2. Close the King Valve hand shut off valve and flag it as being out of its normal position.
3. Ensure the King Solenoid (by LPR) remains energized.
4. Allow as many evaporators as needed to remain on line to help burn off the remaining liquid that is in the HPL line.
5. Remaining liquid is burned off when the LPR pump starts to cycle on and off due to low liquid level.
6. Manually turn off the compressor that will not be used for the pump down.

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**LONG-TERM SHUTDOWN**

7. Shutdown the liquid supply to all of the HPL fed evaporators.
8. Change the suction pressure setting for the compressor that will be used for the pump down to 0 psig.
9. Allow the system to run with these settings. Do not turn off the liquid feed to the LPR until the pump down is complete.
10. Check the King Valve often to ensure it is tightly closed and no frost is forming across the valve. If frost is forming, adjust the valve as needed to ensure proper seating.
12. The compressor will cycle on and off as needed to maintain 0 psig as ammonia boils off from the low side of the system.
13. The pump down is complete when the system remains consistently at 0 psig, the compressor is cycling off for at least 10 minutes at a time, and there is no frost present at the Air Units in the Freezer, or on the piping to and from the Freezer.
14. Restore the compressor suction pressure setting from 0 psig to its normal setting.
15. Turn the compressor controls to "Manual Off."
16. Turn off power to the glycol pump.
17. Open all compressor main breakers.
18. Close all compressor suction valves and flag them as being out of their normal position.
19. Shut off power to the condenser pumps and fans.
20. Conduct a system round and log levels, pressures and temperatures at shutdown.
21. Establish an appropriate schedule to monitor system status while the system is shut down. The schedule may vary as needed based on facility experience, the judgment of the Engineering Manager, and the results of rounds.

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**SYSTEM EMERGENCY SHUTDOWN**

**NOTICE**

Do not perform any procedure without full understanding of related components, associated hazards, and relevant system information. You may need to consult other sources such as system drawings, owner's manuals, cut sheets, schematics, etc., for information needed to safely complete the task. Only trained and authorized personnel may work on the system. Any non-routine task will be performed under the direct supervision of the Engineering Manager.

**PARAMETERS**

This procedure shall be used when a large ammonia release occurs and it has been determined that it will be safer to shut down the system rather than to continue to operate it.

This procedure should be used in the following types of situations:

- The Ammonia Machinery Room cannot be accessed to adequately control system components locally at the panels.
- The leak cannot be controlled by isolating an individual component, but it can be controlled or minimized by shutting the system down.
- There is a major high side leak or major high side malfunction.

Keep in mind that once the system is shut down it cannot be used to help pump down ammonia from a leak on the low side. For a major high side leak it is important to quickly shut down the system. *For low side leaks, it is generally much better to leave the system running and use the system to reduce the amount ammonia released.*

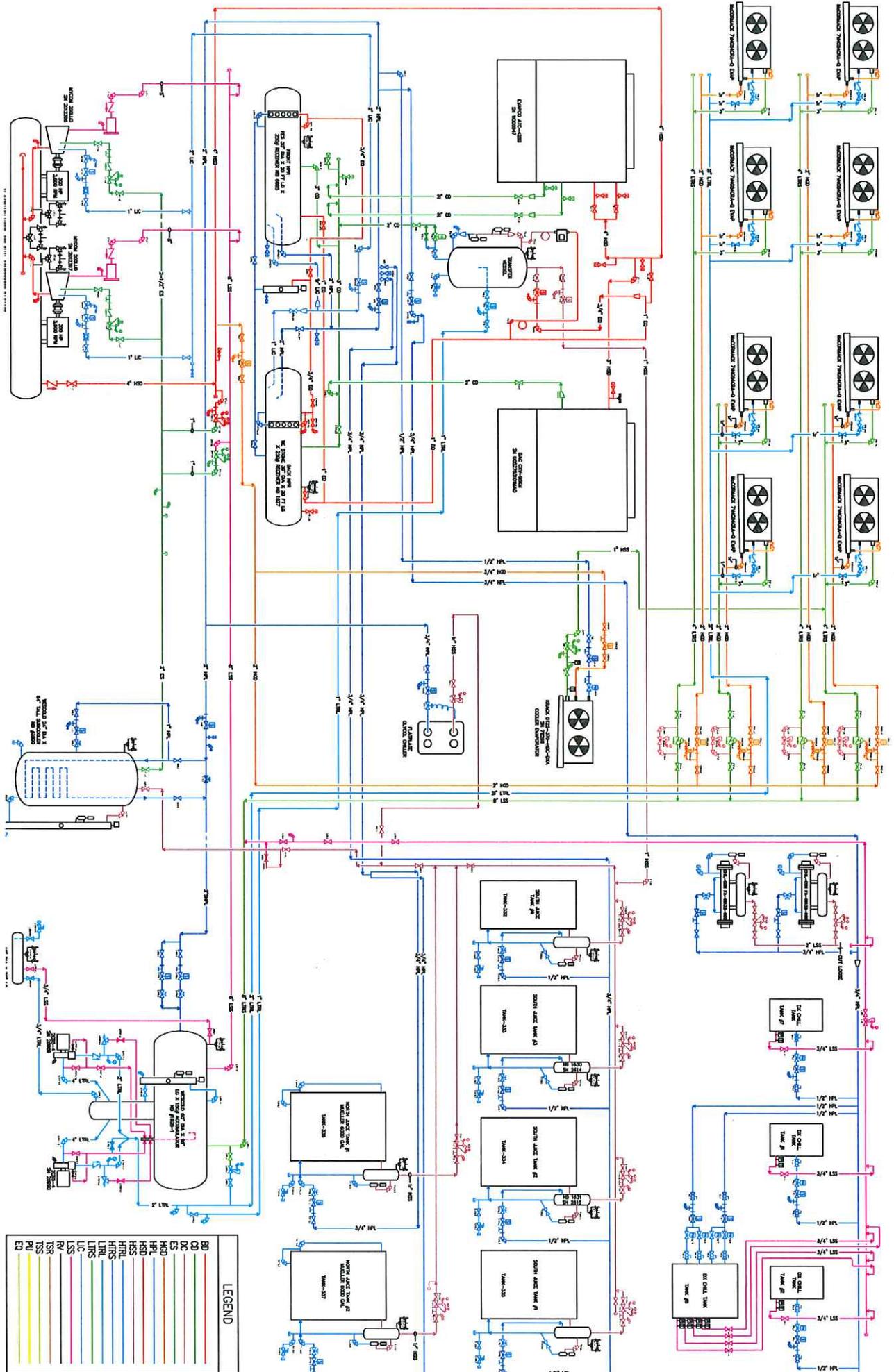
This procedure will result in the following actions:

1. Compressors and liquid pumps will shutdown.
2. King liquid and main hot gas defrost solenoids will close.

**PROCEDURE**

1. Push either emergency stop button. There is one button located outside of the ammonia machinery room main entrance and another button is located outside the boiler room main entrance.

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Approved By:	B. Pesch	© 2012 iWorkWise. For the exclusive use of Ocean Spray.		



**LEGEND**

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## **CONTINGENCY PLAN**

**Ocean Spray Cranberries, Inc. - Markham  
Aberdeen, WA**

November 2020

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## **Business Continuation Team Mission Statement**

Ocean Spray is a fair employer that treats its employees with dignity and respect. Ocean Spray management believes that it has a moral obligation to manage and grow the business entrusted to it by its growers in a way that provides its growers a return on their substantial investment. Management must accomplish this by satisfying the expectations of Ocean Spray's customers for high quality products and services at competitive prices. Achieving these worthy goals must be accomplished through good business practices, fair treatment of its loyal and dedicated employees and in accordance with the laws of the United States of America. When after good faith negotiations Ocean Spray management is unable to reach agreement with any or all segments of its work force it will fulfill its obligation to its customers, investors and employees by continuing to operate the business using all legal means available to protect its employees, customers, grower/owners property and good name.

## Ocean Spray Cranberries Inc.

### CONTINGENCY PLAN

#### I. Plan Organization

##### A. Introduction

In order to protect the business from any weather or crisis-related incidents that would interrupt plant operations, it is necessary to have a Business Contingency Plan for implementation in order that decisions, activities, and organization of people are assured. Therefore, this plan is developed in order to achieve the following:

1. Fulfill the needs of the business, while protecting all plant assets and employees.
2. Essential operations will continue in order to meet customer requirements including use of co-packers and backup resources as required to maintain the business.
3. Distribution of locally controlled physical inventories will continue from remote locations if necessary.
4. Plant facilities will be maintained and protected.
5. Normal production operations will be resumed as quickly as the situation allows.

##### B. Business Continuity Organization Team

This general responsibility for managing this plan the Business Continuation Team. The responsibility for maintaining protection of the employees and company assets is the responsibility of the Business Continuation Team. The following individuals are to be known the Business Continuation Team, and will aid the Human Resources Department in making policy and action decisions, recommending specific actions, ensuring integration of operations, etc. These individuals will solicit assistance from exempt personnel in carrying out their duties as described in this plan.

### Business Continuation Team

Name	Dept/Function	Office Phone	Pager/Cell	Home Phone
Brett Imsland	Plant Director	360-648-2513	903-335-0929	
Rachel Taber	HR	360-648-2524	360-591-9324	
Cristian Dumitrescu	Safety/Security	360-648-2541	360-589-0222	
	Building/Grounds	360-648-2589		
	Boilers/Ammonia	360-648-2516		
	Finance	360-648-2521		
Trevor Williams	Operations/Supply Chain	360-648-2558	360-589-4384	
Randy Harris	IT	360-648-2584	774-260-1750	
Sarah Meehan	Quality	360-648-2533	360-310-3655	
	Performance Excellence	360-648-2564		
Richard Church	Maintenance Manager	360-648-2589	360-591-1586	
Phillip Sanchez	Maintenance Supervisor	360-648-2535	360-589-4029	
Dan Krans	Maintenance Planner	360-648-2535		

C. Each of these activities have been identified for major areas of the business as follows:

- a. Communications
- b. Business Continuation and Transportation

## Overview of Contingency Plan Considerations & Assumptions

The Plan was developed with the following considerations and assumptions:

1. Plant production would not be available.
2. Third party distribution is the main source of Distribution.
3. Impact to business will be minimized as much as possible and as such the following preparatory planning will occur in Distribution.
  - a. Corporate demand planning and Markham Production Planning will determine the volume of product and product mix needed to fill orders during a plant outage.
  - b. Distribution will meet with Production Planning for the purpose of improving and augmenting warehouse inventory situations.
  - c. Production Planning will revise production schedule in an effort to have warehouse inventories as large and as balanced as possible as the situation dictates.
  - d. Corporate Demand Planning and Markham Production Planning will develop a strategy using sister plants and co-packers to support the Northwest area demand requirements.
4. Other administrative functions will continue including HR, IT, Finance, Customer Service, and Quality.
5. Facility security preservation must be maintained seven days a week 24 hours a day.
6. Production planning must include an orderly shutdown and start-up procedure in order to resume operations as soon as possible.
7. Communications to company, employees, vendors, local, state, and federal authorities must be included in the plan.

**Section: Communication**

This section includes outlines and development of communications to employees, local, state, and federal authorities, vendors and service suppliers. Also in this section is identification of back-up vendors and suppliers if required. This section will include phone trees to ensure all employees are communication to as required, up to and including re-start of normal business operations.

<b>Task</b>	<b>Point Person</b>
<b>Initial Business Interruption</b>	
<p><i>Develop a letter to outline wage/benefit information</i>            Benefit operation regarding payroll, insurance, and other benefits.            How do I make a loan payment            Can I use vacation/deferred holiday, casual day            How can I pay for insurance? Will insurance continue?            Can I get money out of the credit union?            If on layoff will I get unemployment?            Locker access            Tool access            Retirements            How will I know when to come back to work?            How do I pay for 401K/credit union loan?            How do I access my 401K?            How do I handle insurance questions?            How will garnishments be handled?            How will I get my last check?</p>	Rachel Taber
<p>Notification of local Aberdeen/Trade News Media            Contacts are to be made with local newspaper publishers and broadcasters including radio and TV            All releases are to be prepared and approved by public relations in Lakeville.            Identify who will prepare and approve press releases.            Establish communication link between corporate and local media.</p>	Corporate Communications Dept. 508-946-1000
<p><i>Notification of police and fire department</i>            Immediately preceding the first day of business outage, contact will be made to the local police and fire department.</p>	Cristian Dumitrescu/Brett Insland

**Section: Business Continuation and Transportation**

This section includes provisions to ensure continued distribution and shipment of physical inventory and processes to identify sources to produce product at sister plants or co-pack locations. The overall objective of this section is to insure business continuation and customer service. The means of transportation by which materials and finished goods are normally delivered to the plant are to be identified and listed. This includes the amount of material that would be received by truck, the availability of non-union trucking and alternate methods of delivering material. This section also includes handling of perishable raw materials.

<b>Task</b>	<b>Point Person</b>
<b>At the Beginning of the Business Outage</b>	
Identify items in high demand and begin transferring to outside storage if possible	Trevor Williams
Determine warehouse capability requirement placement options.	Trevor Williams
Develop a five to seven day plan to move product during the first week of the business interruption	Trevor Williams
Determine tools to use to monitor raw material (i.e. cooler, freezer) inbounds to redirect shipment. SAP truck log.	Trevor Williams
<b>During Business Outage</b>	
Monitor on-hand inventories should a business interruption occur	Trevor Williams
<b>After Business Outage</b>	
See Communications section.	
Notify all carriers and vendors to ramp back to normal operations.	Trevor Williams

**Section: Food Safety**

<b>Task</b>	<b>Point Person</b>
<b>At Beginning of Incident</b>	
Evaluate Food Safety/Food Quality risks to affected products	Sarah Meehan
Evaluate Food Safety/Food Quality risks to affected plant areas and equipment	Sarah Meehan
Evaluate Food Safety/Food Quality risks pertaining to personnel	Sarah Meehan
<b>During Incident</b>	
Implement Food Safety/Food Quality risk mitigation strategies	Sarah Meehan
Coordinate product holds associated with incident	Sarah Meehan
<b>After Incident</b>	
Develop Food Safety/Food Quality plan to support business resumption	Sarah Meehan
Implement any corrective actions related to the incident	Sarah Meehan

## **Notification of Officials**

### **Police Department**

Police Department 911

WA State Police 911

### **Fire Department**

Westport Fire Department 911

### **City Hall**

Mayor: Rob Bearden- Westport 360-268-0131  
Mayor: Erik Larson- Aberdeen 360-537-3227

### **News Media**

Corporate Communications is in charge of all media contacts  
508-946-1000



OCEAN SPRAY CRANBERRIES, INC.  
PANDEMIC PREPAREDNESS PLAN  
MARKHAM

Updated April 2011	Updated June 2012	Updated January 2013
Updated June 2013	Updated August 2015	Updated January 2017
Updated October 2017	Updated March 2018	Updated February 2019
Updated September 2019	Updated February 2020	Updated August 2020

## SUMMARY

In keeping with the corporate direction for influenza pandemic preparedness the Markham facility has responded by implementing a plan to respond to a potential pandemic outbreak. The goal of this plan is to ensure Markham business continuity and the wellbeing of its employees.

It is the intention of the Markham facility to continue to operate key functions during level one, two and three responses. This facility will be the central communication system for its employees. Phone tree, attendance line, monitors, and the website will be activated to notify personnel with updates and procedures.

The Markham facility is represented on the Local Area Emergency Planning Committee and will be actively involved in the planning, and executing of the Grays Harbor Community response to a pandemic. From this position Markham will be a part of the phone tree notification in the event of an outbreak.

In the event of an outbreak the Markham facility has identified EHS and HR that will coordinate the activities of the organization. The EHS/HR representatives and Plant Director may implement key disease containment strategies that may include social distancing, isolation, quarantine and fitness for duty. Medical screening and placing employees in 48 hour quarantine before starting shift may be implemented in a level three outbreak.

The Markham facility will work with local medical providers to care for ill employees. Employees with primary care physicians will be helped to make appointments as needed. Those employees without primary care physicians will be referred to the Emergency department.

In the event of a level three outbreak the supervisors with the assistance of EHS/HR will handle the phone scheduling, fitness for duty screening and attendance line review. EHS/HR will provide oversight guidance for minimal staffing based on the annual pandemic business continuity assessment.

The Markham business continuity assessment indicates that the plant is capable of a weeklong shutdown without critical system failures. However, the goal of Markham will be to continue business during a pandemic outbreak. Non-essential business functions may work from home. Payroll, HR, office personnel will function off site using phone and VPN connections. HR will provide the staff with ongoing health support such as available clinics, and benefit information. Operations and Supply Chain will provide ongoing communications with suppliers and vendors, and the Plant Director will provide the communication between the plant and corporate.

The Markham facility will maintain personal protective equipment to include gloves, safety glasses, and masks (N95). The facility will also have hand sanitizer located throughout the facility to be used in conjunction with proper hand washing procedures.

Annual training will include influenza prevention, hygiene and food handling procedures. Each subsequent year, risk assessment review will be conducted by the Pandemic team.

The emphasis will be placed on teaching employees home and work illness preventive measures. Vaccines when available will be offered without charge to Ocean Spray employees. Proper hygiene and food handling will be stressed in training. The facility will encourage a single use utensil and discourage sharing food. Training materials from the Homeland Security, Department of Health and Grays Harbor Health Department will be used.

For comments or additions to this plan please notify the planning committee. The members include: Cristian Dumitrescu, Glen Piehl, Trevor Williams, Rachel Taber, Sarah Meehan and Brett Imsland.

# **Ocean Spray Cranberries, Inc.**

## **Pandemic Preparedness Plan**

### **Introduction**

“Ocean Spray Cranberries has prepared a plan to protect the health of its employees and maintain critical business functions if a flu pandemic or similar crisis occurs” (Ocean Spray, Headquarters, 2006).

The issue that has Public Health experts and Ocean Spray Cranberries, Inc. concerned about is the possibility of another influenza pandemic. There is increasing concern that the next pandemic outbreak may occur. At this time there is no known cure and the outcome of an outbreak may have devastating results. It is anticipated that influenza may cause significant failures in our ability to operate. It is also believed that an outbreak that will come in six to eight week waves that will cause absenteeism rate of up to 40 percent.

The Markham facility has created a planning team to address the issues associated with a pandemic outbreak. In keeping with the corporate direction this facility has developed the following plan in response to a potential outbreak. The team includes;

Plant Director – Brett Imsland	Sarah Meehan – Quality Engineer
Human Resources – Rachel Taber	EHS – Cristian Dumitrescu

The goal of this plan is to ensure Markham business continuity and the wellbeing of its employees by addressing preparation and response procedures to a pandemic outbreak. Level one –Prevention emphasizes core preparedness measures. Level two-Response indicates that a pandemic has been declared, but not yet affecting the region and Level three declares an outbreak of pandemic influenza in the region.

In the event of an outbreak, notification will be issued to the Local Emergency Planning Committee (LEPC) of Grays Harbor in which Markham is an active participant. The committee will activate the phone tree to notify local emergency personnel and businesses.

The Ocean Spray Markham facility will provide the central communication system for its employees. It will notify personnel as needed with updates and procedures. It is the intention to continue to operate key functions during level one and two responses.

## **Level One: Prevention**

### **Training:**

Education and procedures will be implemented by the planning committee. Annual training will include influenza prevention, hygiene and food handling procedures. Each subsequent year risk assessment review will be conducted by the planning team.

Emphasis will be placed on educating employees on home and work preventive measures. Materials from the Department of Health and Grays Harbor Health Department will be used as training aids.

Training sessions will include hands on practice with PPE, hand washing and food handling procedures.

Department of Health Stay Healthy materials will be used as posters, handouts and subject outlines. Trainings will include but not be limited to the following;

- Cover your mouth & nose with disposable tissue or sleeve. Wash immediately.

- Avoid eating, drinking, smoking; apply lip balm or contacts before washing hands

- Hand washing –Apply 3-5cc liquid soap Rub hands at least 15 seconds. Turn faucets with paper towel.

- Hand washing – sanitizer gel rub hands, get fingernails until dry.

- Stay home with fever

- Call health care provider as soon as symptomatic

- Face masks may be used for coughs – surgical masks & N95

- Don't share towels, foods etc.

- Make personal emergency plans

- Have home emergency kits

- Cleaning surfaces 1/3C bleach to 1 gallon water (Attachment)

Department of Health Video – Preparing for a pandemic 11 minute video from Spokane County is training resource for plant meetings.

### **Fitness for Duty and Medical Readiness**

Vaccines will be offered at no charge to Ocean Spray employees if available. Immunization schedules will be posted and covered in the plant trainings. Employees may elect not to receive the pro-offered immunization. All employees will receive training in the self assessment, fitness for duty screening in level two or greater outbreak.

### **Hygiene & Sanitation –**

The Markham facility will train employees in proper hand washing using both soap and sanitizer procedures. The facility will encourage a single use utensil and discourage sharing food. In the event of a level two, outbreak EHS/HR may stress the importance of avoiding the sharing of food.

Equipment exposed to possible contamination should be disinfected daily. Examples would include; telephones, keyboards, door handles, and light switches. They should be wiped daily with disinfectant or a bleach solution.

Food Preparation should include storing foods in separate containers, refrigerate foods clean and disinfect counters.

## **Level Two: Response**

### **Influenza Reporting Procedures**

In the event of Pandemic Outbreak which could endanger human health the responsibilities are:

#### **Initial Notification**

Call received will advise a pandemic outbreak and alert the company to ongoing information. Call received should be reported to the EHS/HR.

Radio advisory, health department LEPC notification shall be reported to the EHS/HR.

CDC/flu.gov will be monitored and reported by EHS/HR to employees.

#### **Supervisors**

Supervisors of each department will monitor attendance line for incoming calls and notify EHS/HR if unusual activity occurs.

Supervisors will implement medical screening/fitness for duty, advise ill employees to seek medical attention and refer to EHS/HR for ongoing assistance.

Clearance for work will be determined by EHS/HR and fever free for 24 hours.

The maintenance supervisor will account for all contractors and visitors that are on site and advise of level two or greater outbreak. Contractors will be dismissed until pandemic concern is passed. If a contractor appears sick upon arrival for work the supervisor will dismiss the work until symptoms are free 24 hours.

If an employee becomes sick while on duty a call to EHS/HR for determination should ensue.

#### **EHS**

Assume incident/medical Command until relieved by Public Health Fire/Police. The Command will direct all activities until relieved.

Directs medical and contingency activities.

Ensure supervisor roll call or attendance screening procedures are in effect. Ensures preparedness packs and medical supplies are available.

Gather information from the rescue/medical team about the on site illnesses.

Ensure that all outside medical or community services are called if necessary.

Determine whether site evacuation is needed and direct such if necessary.

Notify the Plant Director, if not on site.

Make preparedness level notifications as necessary.

Implement containment strategies.

Determines timeline for release from level response based on CDC guidelines

#### **Human Resources**

Works interchangeable with EHS to provide the latest Health Department information.

Provides benefit support, community resources and medical providers as needed.

### Plant Director

The Plant Director will attend to the public relations, external communications and corporate notification. In a level two or greater the Plant Director will maintain communications with the community and corporate to determine business continuity next steps.

Specific pandemic protection and response strategies to be implemented by the Plant Director, EHS/HR will have varied implications and efficacy. All are necessary health strategies to limit social interactions and disease spread; thus reducing illness and death and mitigating the direct economic impacts. Key disease containment strategies include:

**Isolation:** This separates people with specific infectious illnesses in their homes, in hospitals, or in designated healthcare facilities. Isolation at Markham may include keeping employees in designated work areas, or extended stays in the facility.

**Quarantine:** Separation and restriction of the movement, usually of a group of people, who, while not yet ill, have potentially been exposed to an infectious agent. Markham employees who may be exposed will be required to remain home or seek medical attention. Release to duty forms may be instituted.

**Social Distancing:** Within the workplace, social distancing measures could take the form of: modifying the frequency and type of face-to-face employee encounters (e.g., placing moratoriums on hand-shaking, substituting teleconferences for face-to-face meetings, staggering breaks, posting infection control guidelines); establishing flexible work hours or worksite, (e.g., telecommuting); promoting social distancing between employees and customers to maintain three-foot spatial separation between individuals; and implementing strategies that request and enable employees with influenza to stay home at the first sign of symptoms.

**Voluntary Distancing/Isolation:** of assembly areas. Encouraging the voluntary avoidance of public places, including churches, schools, and theaters.

The Markham facility will post information on the intranet, monitors and boards. They will have key personnel knowledgeable in helping employees seek community services, medical assistance and benefit support. All employees are encouraged to keep in touch with the facility for the latest update. [www.oceanspray.com](http://www.oceanspray.com) website will be activated in the event of a crisis as well.

**Hygiene & Sanitation** – In level two or greater response to an outbreak increased hygiene and sanitation measure will be implemented. Masks, gloves, and eye protection may be issued. If directed by the IC, PPE will be worn in all environments of the facility until released by the IC.

Immediate disinfecting procedures will be instituted. Available employees will don PPE and assist in the sanitation of the facility. Facility sanitation may increase to hourly sweeps if necessary.

Single use utensils will be implemented with the banning of shared food.

### **Business Continuity**

Staffing may become an issue in a level two or greater outbreak of influenza. Supervisors will monitor scheduling and attendance line if staffing becomes difficult. Consultation with HR will prompt the execution of the business continuity plan. This continuity plan includes an annual risk assessment of key personnel and processes loss exposures. This plan when executed moves non essential business functions to offsite work using access cards and laptops to communicate with the business. Payroll requires backup for the payroll data entry and will need access to the time clock.

Each department will submit their plan for key personnel coverage in the event of an emergency. Loss of staffing in a pandemic will be covered by cross trained individuals. In the event that the facility is no longer able to operate due to pandemic a controlled shutdown may be instituted by Operations. (see specific business continuity plan in the EHS)

The Markham facility has determined it can shut down for one week without severe complication. In the event of a shutdown off site work may commence using cell phone, computer/VPN. (see emergency shutdown procedures in EHS).

Medical screening and placing employees in 48 hour quarantine before starting shift may be implemented in a level three outbreak.

Communications with suppliers ensuring their participation in Pandemic planning each year will assist the planning committee to prepare secondary measures in the event of an interruption of services.

In a level two or greater outbreak the pandemic team will implement a communications plan for operations to discuss with suppliers emergency plans. Inbound and outbound suppliers may experience a change in their ability to provide services in an outbreak and Markham will contact the second tier suppliers should the need arise.

**Business Continuity Matrix**

<b>Department</b>	<b>Activity/Equip</b>	<b>Key Personnel</b>	<b>Replacement</b>	<b>Criticality</b>
<b>Administration</b>		<b>Brett Imsland - Plant Manager</b>	<b>Trevor Williams</b>	<b>High</b>
<b>Finance</b>	<b>Payroll AP/AR Taxes Capital</b>	<b>Rachel Taber Brett Imsland</b>	<b>Glen Piehl</b>	<b>Low Risk Off line up to 30 days.</b>
<b>Processes</b>	<b>Computer</b>	<b>Payroll is web based with laptop backup</b>		<b>Low Risk</b>
	<b>Vendor notification</b>	<b>Maximo and Sap</b>	<b>Supply Chain</b>	<b>High Risk</b>
<b>Operations</b>	<b>SDC Sauce Maintenance Transportation Waste Water</b>	<b>Vicki Heath Supervision, Electrician, Mechanic, Boiler Mechanic</b>	<b>Supervision Additional Sup, Elect, Mechanic, Boiler Op Troy Gillespie</b>	<b>Med Risk – Able to shut down for 1 week</b>
<b>Processes</b>	<b>Controlled shutdowns or restarts</b>	<b>1 mechanic, 1 electrician, 1 WW op, 1 boiler op</b>	<b>King Valve ammonia, boiler, motor manual restarts, freezer door override, electrical circuits off.</b>	<b>High Risk Must follow steps</b>
	<b>Berries</b>	<b>Berries to freezer, juice to tanks</b>	<b>Operators written proceed</b>	<b>High Risk</b>
<b>HR/EHS</b>	<b>Medical Communications Benefits Security Environmental</b>	<b>Cristian Dumitrescu Rachel Taber Rachel Taber Glen Piehl Cristian Dumitrescu</b>	<b>First Aid Team Cristian Dumitrescu Glen Piehl</b>	<b>Low Risk off line up to 30 days</b>
<b>Facilities</b>	<b>Plant function</b>	<b>Glen Piehl</b>	<b>Glen Piehl</b>	<b>Med Risk Able to shut down for 1 week</b>

### **Level Three: Regional Outbreak**

Level Three pandemic outbreak will require the same steps as outlined in Level One and Two. In addition the Plant Director will be maintaining communications with the Community and Corporate Offices. Updated plans and procedures will be executed as directed by the Plant Director.

The Plant Director may opt to implement any core strategy that protects the Ocean Spray Cranberries business. Employees will be informed and updated through the Ocean Spray Cranberries website, and phone procedures.

## **Terms/Definitions**

Antibodies – After exposure an infected person may develop antibodies to protect against further infection of the same nature.

Antivirals – Medication used to treat the symptoms of Influenza. It also has prophylactic properties and may be recommended in an outbreak. Antiviral medications may be obtained at our local medical resource.

Business Continuity - is the ability of the organization to ensure continuity of service and support for its external customers.

Critical business functions – None

Non-Critical business functions - Office, Sauce, SDC and mechanical

Contagion – Influenza virus is spread from person to person through close contact by droplets produced when an ill person sneezes or coughs. Infected persons are contagious 24 hours prior to symptoms through 5-7 days after symptoms. The contagion will be in waves last 6-8 weeks and may continue up to 18 months. Infected persons may not have symptoms and can still infect others.

Isolation – Isolation of infected persons may help to slow the spread of this disease; to this end medical readiness steps will be implemented by EHS and HR to minimize EE exposure to influenza. Voluntary isolation of healthy individuals may also minimize the spread of infection and may be employed in Level two or greater outbreaks.

Level One Prevention– Emphasizes core preparedness measures which include training, supplies, and vaccines. This plan should be reviewed annually.

Level Two Response – Indicates that a pandemic has been declared, but has not yet affected the region. In this level the Incident/Medical Command (IC) will assume responsibility and may institute separation and restriction on movement procedures for Markham employees. The IC will monitor and direct communications for the facility.

Level Three Alert – Indicates a pandemic has been declared in the area. Incident/Medical Command (IC) will work with supervision to implement minimal employee staffing requirements Current requirements are two shifts, four employees for juice extraction only.

Medical Screening -Procedures will be implemented to mitigate transmission. Employees with temperatures above 100 degrees will need to call the supervisor attendance line. Return to work will be granted for Employees free from fever 48 hours

or those with routine colds and five days symptom free with influenza. Signs and symptoms of influenza include;

- Fever >100 degrees
- Cough
- Sore Throat
- Runny Nose
- Joint/Muscle Aches
- Chills/Sweats
- Fatigue
- Headache

Medical Supplies – kept on hand

Surgical Masks in level one may be used for those with coughs.

N95 masks in level two and above.

Single use thermometers will be maintained in the emergency response kits

Gloves should be worn when cleaning or disinfecting and then disposed.

Safety Glasses will remain in effect and assist in the prevention of transmission

Sanitizing Hand wash will be located in the facility

Disinfectant solutions should be used according to manufacturer's recommendations and

MSDS sheets will be maintained include respiratory fit test per OSHA guidelines.

Medical Treatment- Vaccines and Antiviral Medications are recommended by the Health Department and will be encouraged for Markham Employees as well. Pre-season vaccine schedules will be posted. Employees returning with receipts for vaccines will be reimbursed through HR. HR/EHS will maintain a list of medical providers in the area that will provide treatment for influenza. Antiviral medications are believed to lessen the effects of influenza and employees will be encouraged to seek medical attention where antiviral meds are available.

Quarantine: - Separation and restriction of the movement, usually of a group of people, who, while not yet ill, have potentially been exposed to an infectious agent.

Social Distancing- Within the workplace, social distancing measures could take the form of: modifying the frequency and type of face-to-face employee encounters (e.g., placing moratoriums on hand-shaking, substituting teleconferences for face-to-face meetings, staggering breaks, posting infection control guidelines); establishing flexible work hours or worksite, (e.g., telecommuting); promoting social distancing between employees and customers to maintain three-foot spatial separation between individuals; and implementing strategies that request and enable employees with influenza to stay home at the first sign of symptoms.

Voluntary Distancing/Isolation of assembly areas. Encouraging the voluntary avoidance of public places, including churches, schools, and theaters.

## **Emergency Contact Information**

### **EHS/HR**

1. Cristian Dumitrescu Cell 360-589-0222 Office 360-648-2541
2. Rachel Taber Cell 360-591-9324 Office 360-648-2524

### **Plant Director**

1. Brett Insland Cell 903-335-0929 Office 360-648-2513

### **Emergency Contact Numbers**

**Ocean Spray Markham - 360-648-2201**

**Ocean Spray Corporate – 508-946-1000**

**Department of Health 360-236-4027 – [www.doh.wa.gov/panflu.com](http://www.doh.wa.gov/panflu.com)**

**Red Cross – [www.redcross.org](http://www.redcross.org)**

**Centers for Disease Control – [www.cdc.gov](http://www.cdc.gov)**

**US Gov Influenza Site – [www.pandemicflu.gov.com](http://www.pandemicflu.gov.com)**

**Dept of Agriculture- [www.agr.wa.gov](http://www.agr.wa.gov)**

**Local Radio Channels**

### **Health/Mental Health/Community Resources & Clinics**

#### **SeaMar Medical Clinic**

1817 Sumner St

Aberdeen, WA 98520

360-538-1293

#### **Grays Harbor Community Hospital**

915 Anderson Dr.

Aberdeen, WA 98520

360-532-8330

#### **Grays Harbor Crisis Clinic**

615 8th Street

Hoquiam, WA 98550

Emergency telephone: (360) 532-HELP *or* 1 (800) 685-6556

Non-emergency telephone: (360) 538-2889

Fax: (360) 538-0124

\*There are no eligibility requirements for utilizing Crisis Clinic services.

#### **Evergreen Counseling Center**

205 8th Street

Hoquiam, WA 98550

Reception Desk: (360) 532-8629  
Triage Department: (360) 538-9290 or 1-800-654-3837  
Information about the status of request for services: (360) 538-9261  
Fax: (360) 532-8786

**Behavioral Health Resources**

575 East Main Street, Suite 3  
Elma, WA 98541  
Telephone: (360) 482-5358  
Fax: (360) 482-6256

**Grays Harbor County RSN**

2109 Sumner Avenue, Suite 203 MS WA-51  
Aberdeen, WA 98520-3699  
RSN Program Manager: (360) 532-8665 x.285  
RSN Program Specialist: (360) 532-8665 x.282  
Fax: (360) 533-1983

**Social Security Administration**

[www.socialsecurity.gov](http://www.socialsecurity.gov)

**Employment Security**

Work Source Grays Harbor  
511 W. Heron  
Aberdeen, WA 98520  
360-533-9318

**Unemployment Insurance**

800-318-6022

**Animal Control**

409 S. Monroe  
Aberdeen, WA 98520  
360-537-3382

**OCEAN SPRAY CRANBERRIES, INC.**  
**PANDEMIC/COVID-19 PREPAREDNESS PLAN**  
**FEBRUARY 2020**

**1. INTRODUCTION**

Ocean Spray Cranberries has prepared this plan to protect the health of its employees and maintain critical business functions if a flu pandemic or similar crisis occurs. *It has recently been updated to be more specific to, and better prepare Ocean Spray to respond to the COVID-19 flu outbreak*; some Ocean Spray employees in China have already had to take physical precautions.

The World Health Organization (WHO) and the U.S. Center for Disease Control (CDC) identifies three levels of response to a pandemic.

- Level 1 is the *Preparedness Level*. This level emphasizes core preparedness measures.
- Level 2 is the *Pandemic Alert/Unaffected Region Level*. This level indicates that a pandemic has been declared but has not yet affected your region.
- Level 3 is the *Pandemic Alert/Affected Region Level*. This level indicates that a pandemic has been declared for your region.

This Plan addresses Level 1 and provides preparation measures for Level 2 and Level 3 should these Levels occur.

**2. BACKGROUND**

Public health experts worldwide are concerned about the possibility of another influenza pandemic. The timing and pattern of such a pandemic is unpredictable. The potential economic and human impact of a pandemic is significant. Past pandemics provide information as to how we may be affected by a novel influenza virus and how societies and businesses will react to a pandemic.

- Three influenza pandemics have occurred in the 20th century -- in 1918, 1957 and 1967.
- The World Health Organization (WHO) has predicted between 2 and 7.4 million people would die if a worldwide pandemic occurs.
- Influenza pandemics occur in waves. The time interval between the first and second waves could be three to nine months based on previous pandemics.
- A pandemic could result in absenteeism of up to half of the workforce for a two- to three-week period.
- As a pandemic progressed, domestic and international travel would be curtailed, and supply chains strained.

The Plan is organized into 3 sections: Medical Preparedness, Business Continuity, and Communication. An outline and summary of each of the three sections is below, with details and documents attached as Appendices. The precautions outlined below are consistent with CDC's latest guidance to businesses in preparing response to the COVID-19 outbreak:

[https://www.cdc.gov/coronavirus/2019-ncov/specific-groups/guidance-business-response.html?CDC\\_AA\\_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fguidance-business-response.html](https://www.cdc.gov/coronavirus/2019-ncov/specific-groups/guidance-business-response.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fguidance-business-response.html) .

### **3. MEDICAL PREPAREDNESS**

Medical Preparedness is designed to be used at a facility level and is divided into 3 levels of response.

Level I is the *Preparedness Level*. This level emphasizes core preparedness measures which should be reviewed on an annual basis.

Level II is the *Pandemic Alert/Unaffected Region Level*. This level indicates that a pandemic has been declared but has not yet affected your region. This is the time to begin instituting additional preparation and educational measures.

Level III is the *Pandemic Alert/ Affected Region Level*. This level indicates that a pandemic has been declared in your region and you should begin instituting all procedures to respond and recover.

#### **3.1 Governmental Resources**

Each Ocean Spray location shall identify key public health contacts (name, phone number, e-mail), at local/regional level that would serve as a link for situation update, public health/medical policy/guidelines and legal requirements etc. Where practical, Each Ocean Spray Location should get involved in policy groups that potentially could affect facility operating capabilities.

Excellent sources of national/international governmental information are found on the following web sites: [www.who.org](http://www.who.org) (World Health Organization); and [www.cdc.gov](http://www.cdc.gov) (U.S. Center for Disease Control) and should be referenced frequently for official updates and recommendations. Ocean Spray's **COVID-19 TEAMS Site** has a listing of other websites for governmental agencies weighing in on the COVID-19 outbreak (see Government Guidance Folder).

#### **3.2 Medical Community Linkages (i.e. medical clinic)**

Each Ocean Spray location shall identify local medical resource(s) to assist in off-site support (i.e. fever clinics, COVID-19/Pandemic Hospital etc...). [N/A for Level 1].

#### **3.3 Facility**

##### **3.3.1 Level 1 Precautions**

- Influenza Program (employees) – Each year Ocean Spray will promote the practice of all employees receiving an annual flu vaccination.
- Facility Cleaning and Disinfecting
  - Ensure food preparation areas, serving areas and restrooms receive thorough cleaning with appropriate disinfectant
  - Maintain routine cleaning of high risk, high traffic areas (i.e. banisters, door handles, elevator buttons, etc...)

- General Facility Cleaning—once pandemic response triggered (Level III) facility cleaning should be increased to *once a shift*.
- Hygiene Education
  - Display signs encouraging hand washing prior to and after eating, preparing food, using restroom, etc.
  - Provide adequate facilities for hand washing; consider alcohol-based hand sanitizers in conjunction with soap as appropriate.
  - On-site eating facilities: once pandemic response triggered (Level III) facility will only allow single use utensils (chop sticks, flat ware). Sharing of food/utensils will be banned.
- Food Handling and Preparation
  - If food is stored in workplace maintain refrigerator at 40° F (4.4° C) and freezer at 0° F (-17.8° C)
  - Refrigerator and freezer should be regularly cleaned, and disinfected.
  - Food should be stored in separate containers to prevent contamination of the other food.
  - If food is prepared and served in the workplace, regularly monitor to ensure that practices conform to applicable health department standards.
  - One other element to mitigate possible transmission risk would be to assure that the food server is not the same person who is handling and/or culling the livestock or poultry.
- Promote Travel Awareness and increased sensitivity to hygiene and illness symptoms. The Center of Disease Control web site ( [www.cdc.gov](http://www.cdc.gov) ) has extensive information regarding travel health and safety. Additionally, those employees travelling internationally should be signed up for and receive health advisories from International SOS. <https://www.internationalsos.com/>

### 3.3.2 Level 2 Precautions

- Each Ocean Spray Location shall evaluate the existing Corporate Attendance Policy (HR 3.18 – see **COVID-19 TEAMS Site**) and Plant-Receiving Station-specific attendance policy in the event of potential quarantine restrictions affecting ability to attend work.
- Establish medical screening protocols for employees reporting to work (i.e., free of fever (100.4° F or greater using an oral thermometer), signs of a fever, and any other symptoms for at least 24 hours, without the use of fever-reducing or other symptom-altering medicines (e.g. cough suppressants) temperature screens).
- Establish vendor/contract worker screening protocols and communication (especially if food service offered).

### 3.3.3 Level 3 Precautions

- Each Ocean Spray Location shall establish contingency plans to segregate/isolate critical business groups (See Section 4: Business Continuity).

- Contractor Coordination: plan for contractor resource loss and communication/coordination of preparedness plans.

### **3.4 Employee**

- Participate in Influenza Program and get vaccinated.
- Practice good personal hygiene habits. Ocean Spray's Good Manufacturing Practices (GMP's) are aligned with minimizing risk of catching the flu.
- Fitness for duty standard and triage protocols - employee responsibility to adhere to protocols.

## **4. BUSINESS CONTINUITY**

Business Continuity, for the purpose of this Plan, is defined as "the ability of the organization to ensure continuity of service and support for its external customers".

Business Continuity Planning is outlined in Corporate Legal Policy 8.11 *Crisis Notification and Preparedness Policy*, along with Quality Operating Standard (Q.OS.) 9.41 (*Business Continuity Planning*) and its companion Attachment 9.4.1A (*Alternate Sourcing and Redundancy Profile*) These documents are found on the **COVID-19 TEAMS Site**. Each Ocean Spray Location shall review this guidance and ensure local compliance.

Fortunately, for many of the business functions at the Corporate offices, recent upgrades in communications technology allow for the majority of corporate employees to effectively work remotely through VPN, and BlueJeans/Teams Conferencing. Each Corporate Department, at the VP or Director level, is responsible for ensuring the operability of its department during a Level 3 condition.

## **5. COMMUNICATIONS**

Several communication tools have been prepared. The **COVID-19 TEAM Site** contains a form letter that can be sent to customers, vendors and suppliers of services requesting information about their response to COVID-19 (under Food Quality/Supply Chain guidance folder).

In addition, several methods of employee, business partner and grower communication have been identified for use in the event of a crisis such as a pandemic:

- Intranet/Email
- Existing Snowstorm Announcement Phone Line (508-946-7878)
- 800 Emergency Information Phone Line (866-721-8686)

### **5.1 Intranet/Email**

In addition to the COVID-19 TEAMS Site, which is open to all Ocean Spray employees, Ocean Spray will use all of its existing communication tools to disseminate COVID-19 related information in an efficient manner: Yammer, Ocean Spray's Intranet Announcements Homepage ( <https://my.oceanspray.com/Pages/default.aspx> ), and Ocean Spray's Newsletter which is emailed weekly.

### **5.2 Existing Snowstorm Announcement Phone Line (508-946-7878)**

In order to provide local information to employees the existing Snowstorm Announcement phone line will be used to communicate to Lakeville employees recorded information pertinent to facility closure, travel restrictions, medical/crisis contacts, etc. in the event of crisis. This vehicle of communication is an alternate to the Emergency Communication site page for those Lakeville employees who do not have internet access.

### **5.3 800 Emergency Information Phone Line (866-721-8686)**

An Emergency Information Phone Line is installed to provide recorded information to all Ocean Spray employees, Business Partners, and growers in the event of a crisis. This phone line will be updated during an identified crisis and will provide information pertinent to facility closures, travel restrictions, medical/crisis contacts, etc. (866-721-8686) Hunt Group 4499

#### **5.4 Additional Communication Platforms**

In addition to the above, a **COVID-19 Team** site was created for use by the Pandemic Planning Team. As part of the Level 1 preparedness, this site allows for collaboration amongst team members and is a repository for all documents, project plans, informational articles, and links to web sites related to flu pandemic. In the future, this site could potentially serve to provide employees with important information on pandemic preparedness, medical information, and local, state and federal resources.

## COVID-19 Cleaning and Sanitizing Procedures

### 1. Normal and Preventive Cleaning and Sanitizing Procedures

**Purpose:** To maintain cleanliness of facilities and reduce the likelihood of spread of the virus within the facility.

#### A. Food Contact Surfaces and Production Equipment

Normal sanitation procedures should be followed. No changes to current CIP, COP or manual cleaning.

#### B. Preventive Cleaning of High Touch Areas

This applies to high touch surfaces in non-production areas (offices) and to non-food contact high touch surfaces in the production area. Examples include railings, door handles, switches, touch screens, etc.

Implement a protocol for cleaning and disinfecting these areas at least once per day.

#### **Procedure:**

**Step 1:** If the surface is dirty, clean with an Ecowipe, Ecowipe Duo, or Dry San Duo wipe or Alcowipes.

**Step 2:** Spray the clean surface with Oxonia Active, Vortexx, Octave or Synergex and ensure it stays wet for the required contact time (reapply if necessary). Refer to [Table 1](#) at the end of the document for concentrations and contact times or use RTU disinfectant wipes from [List N: Products with Emerging Viral Pathogens AND Human Coronavirus claims for use against SARS-CoV-2 \[See Table 3\]](#)

**Step 3:** Allow the surface to air dry or wipe with a clean paper towel

**NOTE: Please review the SDS and PPE Requirements. Prior to approving any new chemicals, please check the ingredients for the presence of any allergens or strong fragrances. Do not use products with strong fragrance or allergens, in the production area. Follow GMP Guidelines.**

**For production areas:** Oxonia Active, Vortex, Octave or Synergex or other approved disinfectant in Table 1 can be used on high touch nonfood contact areas, if RTU Disinfectant wipes are not available. You can use disposable dry Wipes in a Bucket (e.g. Kimtec Item #09361 or # 491T28). Make a pail of the disinfectant solution, dip the wipe in the solution, do not reuse the wipe, use once and dispose. Change bucket of sanitizer once per shift. Other option is to fill the spray bottle with the sanitizer. Spray on the surface. Wipe with the disposable dry wipe. Use the solution within 24 hours.

**For water sensitive equipment** -Highly evaporative RTU Sanitizers such as Alpet D2 Quat Free RTU Sanitizer, 60-70%Ethanol based Sanitizers that dries quickly

could be used. [Table 3 has a list of RTU wipes with less than 1 minute of contact time.

**Manseau only:** Spray non-food contact, high touch surfaces with Iso-propanol 70% for disinfecting. Let it dry for 1 minute. Note alcohol-based products are flammable, always first check with EHS and follow SDS guidelines.

**For office areas only** - Ecolab multipurpose disinfectant wipes, Clorox wipes, Samimarc Iso-propanol 70% wipes, Ecolab Peroxide Multi Surface Cleaner and Disinfectant spray, Diversey Oxivir Wipe or other EPA approved disinfectants based on CDC list may be used for **office or non-production areas**. Examples are listed in Tables 2 and 3 at the end of this document.

## 2. Intensive Cleaning and Sanitizing Procedures

**Purpose:** To clean and disinfect upon notification that anyone in the plant is confirmed to have COVID-19 or is exhibiting symptoms indicating COVID-19 infection is highly likely. The goal of this procedure is to clean and disinfect high contact areas, which will be determined on a case by case basis. This cleaning is not a “plantwide” cleaning approach; it is a targeted cleaning and disinfection.

**Personnel:** The Center for Disease Control (CDC) has stated that older adults and people who have severe underlying chronic medical conditions like heart or lung disease or diabetes seem to be at higher risk for developing more serious complications from the COVID-19 illness. It is our belief that with the appropriate amount of precaution, our colleagues can effectively clean and sanitize with minimized risk. Nevertheless, out of an abundance of caution, we ask that anyone considered at higher risk per CDC guidelines avoid involvement in cleaning any facility. If you are uncomfortable participating in any cleaning for any reason, please let your supervisor know.

### Safety Precautions

- When using chemicals always wear goggles/face shield, boots, gloves, and chemical apron.
- As is our normal expectation relative to transmission of any virus (such as the flu), it is critically important that you should not touch your face, mouth or eyes, as you work through the cleaning. Take the appropriate time to stop and clean and sanitize your hands before touching your face and then reclean and re-sanitize your hands before engaging in the cleaning activity.
- Read and understand all product labels and material Safety Data Sheets (SDS).
- For more information on chemicals, refer to SDS binder in plant manager’s office.
- Ensure LOTO is implemented before cleaning and sanitation process begins

### A. Clean In Place (CIP)

No changes to normal CIP procedures.

### B. Dry Clean Areas

This applies to areas that cannot be washed down such as de-palletizers, case packers, palletizers, etc.

Follow the high touch surface cleaning procedure listed above. Apply disinfectant using a sprayer or small spray bottle to avoid over wetting the equipment.

### C. Wet Cleaning

This applies to areas that are foamed or otherwise wet cleaned and rinsed. The table below provides a summary of the procedure. Detailed guidelines follow.

**Summary of Intensive Cleaning Procedure.** Additional disinfection step and rinse highlighted in orange.

Chemical Step	Product	Amount	Concentration	Time	Temperature
Manual Wash	Foam or other Cleaner	Follow Normal Procedures			
RINSE	Water	N/A	N/A	As usual	Ambient
Disinfection (Use any one chemical)	Vortexx	1 fl oz/4 gal of water	0.2%	10 min	Ambient
	Synergex	1 fl oz / 4 gal of water	0.112-0.195%	5 minutes	Ambient
	Octave (FS)	1-2 fl oz /2 gal of water	0.39-0.78%	10 minutes	Ambient
	Oxonia Active (option 1)	3 fl oz/ gal of water	2.8%	3 minutes	Ambient
	Oxonia Active (option 2)	2-5 oz /4-gal of water	0.4-1%	10 minutes	Ambient
	Manseau Facility only	Complete 12/Javel 12	50ml/L of water	5%	5 minutes
RINSE*	Water	N/A	N/A	Until no residue; check pH	Ambient
Sanitize/no rinse	Use Normal Sanitizer	Follow Normal Procedures			

**[\*If Disinfecting with Complete 12, then Rinse, check pH, Foam, Rinse, before using Oxygerm . Complete 12 has bleach while Oxygerm has acetic acid. Make sure we do not mix these chemicals]**

- 1) Close off areas used by the ill persons and wait as long as practical before beginning cleaning and disinfection. If possible, open outside doors and windows to increase air circulation in the area.
- 2) Perform Dry Soil Pick Up: around area to be cleaned. Ensure all large food soils and packaging materials are removed from the area around the equipment (bottles, caps, bags, cartons, etc.).
- 3) Clean Electrical Panels/Controllers using the “high touch area procedure” before this electrical equipment is bagged and protected from water and overspray.

- 4) Rinse exterior and interior of equipment down with hot water. This also applies to environmental surfaces. This helps with breaking down soils and prepares the area to be cleaned for the wash step.
- 5) Continue to disassemble equipment that will need to be broken down to clean stubborn areas of the equipment that can trap soils. As normal, ensure brushes and contact areas are cleaned with clean brushes, aligned with the product tier area.
- 6) Wash using a portable foamer. Once foamer is properly filled with wash solution close foamer tank lid and take the foamer onto the production floor for the cleaning process.
- 7) Begin foaming from bottom to top all food contact surfaces and environmental areas. Ensure all niche areas around the equipment are properly foamed.
- 8) Turn off the foamer and begin to manually scrub the equipment that has been foamed. Allow 10 minutes of contact time.
  - a. Use scrub pads and/or color-coded brush to manually clean.
  - b. The foam along with scrubbing allows the team member to visualize their scrub pattern to ensure all locations of the equipment have been cleaned.
- 9) After scrubbing has been completed proceed to the rinse step
- 10) Rinse down the equipment and environmental surfaces from top to bottom. This process helps removes the soap and broken-down soils from the equipment and environmental surfaces.
- 11) **Disinfection Step:** Next prepare a disinfection solution using **one** of the following options for sanitizers: Vortexx, Oxonia Active, Octave or Synergex.
  - Option 1 - To prepare the solution using Oxonia Active** at high concentration, low contact time: Mix 3 fl.oz of Oxonia Active per gallon of water at ambient temperature. It is critical that a **minimum of 3 minutes of contact time** is achieved with the surfaces being treated with the Oxonia Active Solution.
  - Option 2 - To prepare the solution using Oxonia Active** at low concentration, longer contact time: Mix 2-5 fl.oz of Oxonia Active per 4 gallons of water at ambient temperature(0.4-1%v/v). It is critical that a **minimum of 10 minutes of contact time** is achieved with the surfaces being treated with the Oxonia Active Solution.
  - Option 3 - To prepare the solution using Vortexx:** Add Vortex at 1 fl.oz per 4 gallon of water at ambient temperature ( 0.2% v/v). It is critical that a **minimum of 10 minutes of contact time** is achieved with the surfaces being treated by Vortexx.
  - Option 4- To prepare the solution using Synergex:** Mix Synergex at 1 fl.oz per 4 gallon of water at ambient temperature.It is critical that a **minimum of 5 minutes of contact time** is achieved with the surfaces being cleaning by Synergex.
  - Option 5- To prepare the solution using Octave or Octave FS:** Mix Octave or Octave FS at 1 -2 fl.oz per 2 gallons of water at ambient temperature (0.39-0.78% v/v). It is critical that a **minimum of 10 minutes of contact time** is achieved with the surfaces being cleaning by Octave
  - Manseau Facility only- To prepare the solution using Complete 12:** Mix Complete 12 at 50ml/L of water at ambient temperature (5% v/v). It is critical that a **minimum of 5 minutes of contact time** is achieved with the surfaces being cleaning

by Complete12. Surface must be thoroughly rinsed after contact time. This is not a food contact concentration.

**NOTE: These chemicals (option#1-5) are Strong oxidizing agents and Corrosive. Do not use in concentrated form. Mix only with water according to label instructions. Never bring concentrate in contact with other sanitizers, cleaners or organic substances. When applying the disinfectant solution on open surfaces, apply the solution with a wipe or coarse sprayer. Let it dry. Then rinse or wipe after the critical contact time. Apply as directed under "Disinfection" guidelines on the label or catalog sheet. Do not mix with other chemicals such as Enforce LP or foamer. Do not use high pressure or fine sprayer. Ventilate Buildings and other closed spaces. Please read the SDS and the Label/Catalog sheet guidelines under *Disinfection* section.**

- 11) After proper contact time, rinse the disinfectant solution from the equipment and environmental surfaces to ensure no residue on the surface. [For Organic runs- Rinse, then Foam and rinse again] Check pH to ensure no residue.
- 12) Perform visual inspection on the equipment and environmental surfaces. Using a flashlight inspect all areas of the equipment to ensure no soils remain. If soils remain, repeat wash step. If no soils remain proceed to ATP Step.
- 13) Using the ATP Unit swab the equipment to ensure "Passing" RLU is achieved. Once receiving a "Passing" RLU proceed to the sanitize step.
- 14) Fill another portable foamer or sprayer with sanitizer at a no rinse concentration for food contact surfaces. Note this is much lower concentration than step 10. Apply as normal.

**3. Inventory Management for Regular Cleaning Chemicals and COVID-19 Disinfectants**

- Cleaning Chemicals: Keep atleast 2 weeks stock of regular cleaning chemicals such as caustic, sanitizers. Earlier, the expected delivery was within 5 days. However due to high demand, drivers and freight could be unavailable, so atleast keep a supply of 2 weeks for your regular orders.
- Due to high demand of RTU Disinfectants and wipes, there could be shortage of supply and lead time on Ecowipes, RTU Surface Sanitizer that could last upto several weeks. Additional options for Surface Disinfectants for non- food contact high touch points are available from Diversey, Anderson Chemical and other suppliers [See Table 3, 5, 6]
- List of the approved chemicals is posted on COVID-19 Teams Site-Cleaning Sanitation/Master Cleaning Chemicals. Catalog Sheets, SDS for the Sanitizers are also posted for each Vendor in the Cleaning and Sanitation Folder. Reach out to Corporate Sanitarian and Procurement Manager to work with Ecolab or alternate suppliers to meet your needs.
- For high touch nonfood contact surfaces, facilities can also refer to the [List N: Products with Emerging Viral Pathogens AND Human Coronavirus claims for use against SARS-CoV-2](#) or Table 3 for approved RTU wipes]
- **Prior to bringing any new chemicals, sanitizers, hand soaps, please review the SDS as well as check ingredients for the presence of any allergens or strong fragrances.**
- **Donot use products that contain any allergens or strong fragrance.**
- **Sanitizers used in the production areas should be odorless.**

**Table 1. Concentrations of disinfectants that can be used on high touch non-food contact surfaces.**

	Active Ingredients	Type of Target virus; Dilution Rate and Surface Contact time
Oxonia Active EPA : 1677- 129	Hydrogen Peroxide – 27.5% Peroxyacetic Acid – 5.8%	<p>Option 1: Dilution Rate: Mix 3 fl. oz / gal of water and Surface Contact time: 3 minutes. After 3 minutes, Rinse. Sanitize at no rinse concentration or Ecowipe/Ecowipe Duo</p> <p>Option 2: Dilution Rate: Mix 2-5 fl. oz / 4 gal of water and Surface Contact time: 10 minutes. After 10 minutes, Rinse. Sanitize at no rinse concentration or Ecowipe/Ecowipe Duo</p> <p>VIRUCIDAL: At 0.4% to 1.0% (2 oz. per 4 gallons to 5 oz. per 4 gallons of water) Oxonia Active is effective against Influenza Taiwan/2/62, Influenza A(H3N2) and Influenza A (H1 N1) when used at 20 deg C with a 10-minute contact time Apply as</p>

		directed under disinfection.
Octave	Active Ingredients: Hydrogen peroxide : 7.52% Octanoic Acid : 2.54% Peroxyoctanoic Acid: 0.96%	Dilution: Mix 1-2oz per 2 gallons and Surface contact time is 10 minutes)  Virucidal Statement Octave FS is an effective virucide at a concentration of 1 - 2 oz per 2 gallons (0.39%-0.78% v/v concentration) hard water (500 ppm as CaCOs). At this dilution, Octave FS is effective against Influenza A (H1N1), Influenza A (H3N2), Influenza B, Reovirus, Influenza A, Norovirus, Feline calicivirus and Avian Influenza when used at 20°C with a 10-minute contact time. Apply as directed under Disinfection.
Vortexx	Active Ingredients: Hydrogen Peroxide – 6.9% Peroxyacetic Acid – 4.4% Octanoic Acid – 3.3%	Dilution: 1oz/4 gal and Surface Contact time: 10 minutes. After 10 minutes, Rinse. Sanitize with Ecowipe or at no rinse concentration.  <i>“VIRUCIDAL” Statement on Label/Catalog</i> At 0.2% (1 oz/4 gal of water) Vortexx is effective against Influenza B, Influenza A (H3N2), Influenza A (H1N1), Influenza A (H10N7) and Reovirus on hard inanimate surfaces when used at 20 deg C with a 10-minute contact time in the presence of 500 ppm hard water and organic soil. Apply as directed under disinfection.” After 10 minutes, Rinse and Sanitize or Ecowipe/Ecowipe Duo
Synergex EPA: 1677-250	Hydrogen Peroxide – 10.7% Peroxyoctanoic Acid – 0.63% Peroxyacetic Acid – 2.38%	Dilution: 1fl. oz/ 4-7 gal of water and Contact time: 5 minutes. After 5 minutes, Rinse. Sanitize at no rinse concentration or Ecowipe/Ecowipe Duo  <i>“Virucidal”</i> : At 1 ounce of Synergex concentrate per 4 – 7 gallons of water (0.112-0.195% v/v or 1120ppm – 1950ppm product or 1.12–1.95ml/L) Synergex is effective against Influenza B (ATCC VR-823), Influenza A (H1N1) (ATCC VR-897), and Reovirus (ATCC VR-232) on hard inanimate surfaces when used at a 5 minute contact time in the presence of 500 ppm hard water and 5% blood serum. Apply as directed under disinfection”
Alpet D2 Quat -Free Sanitizer	Ethanol – 62.5%and Isoproanol – 7.5%	Ready to Use Sanitizer Spray for food contact and nonfood contact surfaces for water sensitive equipment. Allow to sit for 1 minute. Dry wipe or let it air dry.
ISO ALCOOL 70% Spray (Only at Manseau)	70% Isoproanol	Ready to Use Sanitizer Spray for nonfood contact surface only. Allow to sit for 1 minute. Let it dry. Wipe after 1 minute with alcowipes

**Table 2. Wipes and RTU disinfectants that can be used in non-production areas (office, bathroom, lunchroom)**

Product Name	Item #	Supplier
Multipurpose Disinfecting wipes	6101858	Ecolab
TB Disinfectant Cleaner RT	6143556	Ecolab
Peroxide Multi Surface Cleaner and Disinfectant (Oasis Pro)	6100791	Ecolab
Dry Wipe- Cleaning Clothes, 12 x 12.5	491T28	KimTech

 EPA Reg. # 6836-340-1677	Name of Supporting Virus	
	Product Name	Product Code
 EPA Reg. # 1839-83-1677	Mult Purpose Disinfecting Wipes	6101858
	TB Disinfectant cleaner RTU	6143556

Name of Supporting Virus	
Dilution Rate	Contact time
Norovirus ( Feline calicivirus surroate)	RTU
10 Minutes	
Rotavirus	RTU
3 minutes	

**6101858:** \$67.49 for 6 x 185 count wipes

**6143556:** \$157.60 for 12 32 oz RTU bottles

Registration Number	Product Name	Company	Formulation Type
<a href="#">70627-56</a>	OXIVIR Tb	Diversey, Inc.	RTU
<a href="#">70627-58</a>	OXY-TEAM™ DISINFECTANT CLEAENER	Diversey, Inc.	DILUTABLE
<a href="#">70627-60</a>	OXIVIR™ WIPES	Diversey, Inc.	WIPE
<a href="#">70627-72</a>	Avert Sporicidal Disinfectant Cleaner	Diversey, Inc.	DILUTABLE
<a href="#">70627-74</a>	OXIVIR 1	Diversey, Inc.	RTU
<a href="#">70627-77</a>	Oxivir 1 Wipes	Diversey, Inc.	WIPE

**Table 3. Other options for RTU Wipes for non-food contact, high touch surfaces areas.**

[List N: Products with Emerging Viral Pathogens AND Human Coronavirus claims for use against SARS-CoV-2] - (Check ingredients for fragrance, allergens etc.)

Product Name	Company	EPA #	Active Product	Target	Contact Time	Type
Spruce-ups	The Clorox Company	5813-58	Quaternary Ammonium	Rotavirus	0.25	Wipe
Micro-kill Bleach Germicidal Bleach Wipes	Medline Industries Inc	37549-1	Sodium Hypochlorite	Norovirus	0.5	Wipe
Oxy-1 Wipes	Virox Technologies Inc	74559-10	Hydrogen Peroxide	Poliovirus	0.5	Wipe
Discide Ultra Disinfecting Towelettes	Palermo Healthcare LLC	10492-4	Quaternary Ammonium; Isopropanol	Human Coronavirus	0.5	Wipe
Peridoxrtu (Brand) One- step Germicidal Wipes	Contac Inc	8383-14	Hydrogen Peroxide; Peroxyacetic Acid	Human Coronavirus	0.5	Wipe
Oxivir™ Wipes	Diversey Inc	70627-60	Hydrogen Peroxide	Norovirus; Poliovirus Type 1; Rhinovirus Type 14	1	Wipe
Oxivir 1 Wipes	Diversey Inc	70627-77	Hydrogen Peroxide	Enterovirus Type D68	1	Wipe
Peak Disinfectant Wipes	North American Infection Control Ltd	88494-4	Quaternary Ammonium; Ethanol	Poliovirus Type 1; Rhinovirus	1	Wipe
Accel TB Wipes	Virox Technologies Inc	74559-3	Hydrogen Peroxide	Poliovirus	1	Wipe
Sani-Cloth Bleach Germicidal Disposable Wipe	Professional Disposables International Inc	9480-8	Sodium Hypochlorite	Adenovirus; Rotavirus; Canine parvovirus; Hepatitis A virus; Poliovirus Type 1; Rhinovirus Type 37; Feline calicivirus	1	Wipe
Avert Sporicidal Disinfectant Cleaner Wipes	Diversey Inc	70627-75	Sodium Hypochlorite	Human Coronavirus	1	Wipe
Wave	The Clorox Company	5813-99	Sodium Hypochlorite	Human Coronavirus	1	WIPE
Clorox Commercial Solutions® Hydrogen Peroxide Cleaner Disinfectant Wipes	Clorox Professional Products Company	67619-25	Hydrogen Peroxide	Norovirus	2	Wipe

**Table 4. Sanitizing Non-Porous Gloved Hands Solution:**

DrySan Duo	<b>No Dilution needed;</b> Apply by spray bottle to ensure exposure to sanitizer for atleast 1 minutes. Let it air dry. Donot rinse.
------------	--

**Table 5. Approved products for non-food contact HTS from Diversey, if Ecolab products are not available.**

Product Name	Package	Item #	Contact time	EPA #	On CDC's	Target	Type	Product Safety	Disinfection Dilution
OXIVIR 1 RTU Sanitizer	OXIVIR 1 RTU 12X32OZ (US)	850916	1 minute	70627-74	YES	Enterovirus	RTU	Check SDS and PPE Requirements	N/A
OXIVIR 1 WIPES	OXIVIR 1 WIPES 12X160EA (US)	100850923	1 minute	70627-77	YES	Enterovirus	RTU Wipes	Check SDS and PPE Requirements	N/A
	OXIVIR 1 WIPES 12X60EA (US) 10X	100962573							
	OXIVIR 1 WIPES 12X60EA (US) 7X8	100850922							
	OXIVIR 1 WIPES 4X160EA (US) RTU	100850924							
	OXIVIR 1 WIPES 4X160EA REFILL PA	100850925							
OXIVIR TB Sanitizer (office only - has fragrance)	OXIVIR TB SANITIZER (U.S)	4277285	1 minute	70627-56	YES	General Virucid	Sanitizer	Check SDS and PPE Requirements	N/A
	OXIVIR TB SANITIZER (U.S)	100898635	1 minute	70627-56	YES	Poliovirus Type	Sanitizer	Check SDS and PPE Requirements	N/A
Oxivir TB Wipes (for office only, has fragrance, not for production area)	OXIVIR TB WIPES 12X160 EA (US) 6	101101225	1 minute	70627-60	YES	Poliovirus Type 1	RTU Wipes	Check SDS and PPE Requirements	N/A
	OXIVIR TB Wipes 12X160ea (US) 6X7	4599516							
	OXIVIR TB WIPES 12X60 EA (US) 7X	5388471							
	OXIVIR TB WIPES 4X160 EA (US) 11	5627427							
	OXIVIR TB WIPES REFILL PACK 4x14	100823905							
J-512	J-512 SANITIZER 12X32OZ EMPTY B	D03920	10 minutes	70627-60	YES	Coronavirus	RTU Wipes	Check SDS and PPE Requirements	N/A
	J-512 SANITIZER 2.5GAL Hanging B	5756026							
	J-512 Sanitizer 2X2.5L	5756034							
	J-512 Sanitizer 4X1gal	5756018							
	J-512 SANITIZER 6X32 OZ	5753407							
G-5	G-5 1249L/330GAL	3514091	10 minutes	6836-266 - 70627	YES	Food Norovirus	Sanitizer	There are some serious health effects if PPE is not worn properly. Please ensure that the when/if you get these new products that it is critical you review the SDS with your	Use instructions : 3 oz/5 gal (650 ppm active quat) for 10 mins. Product contact surfaces require post rinse
	G-5 18.9L/5GAL	3514066							
	G-5 208L/55GAL G	3514074							
	G-5 BULK	57601150							
Divosan Spectrum	DIVOSAN SPECTRUM (US) 330 U.S.	57666330	10 minutes	70627- 63	YES	Coronavirus	Sanitizer	There are some serious health effects if PPE is not worn properly. Please ensure that the when/if you get these new products that it is critical you review the SDS with your teams.	use instructions: 4 oz/ 5 gal (450 ppm active quat) 10 minute contact time and fogging @ 1.5 oz/gal (1200 ppm active quat). Product contact surfaces require post rinse.
	DIVOSAN SPECTRUM (US) 4X1 U.S.	57666280							
	DIVOSAN SPECTRUM (US) 55 U.S.	57666010							
	DIVOSAN SPECTRUM (US) BULK	57666150							
	DIVOSAN SPECTRUM (US) 330 U.S.	57666330							
	DIVOSAN SPECTRUM (US) 4X1 U.S.	57666280							
	DIVOSAN SPECTRUM (US) 55 U.S.	57666010							
DIVOSAN SPECTRUM (US) BULK N	57666150								

**Caution: G5 and Divosan spectrum are Quat based products. These are not for food contact surfaces .Check with EHS and Cedia Boxhill before ordering undiluted quat sanitizers, if you run organic products.**

**Table 6. Approved products from Anderson Chemical Company, if Ecolab products are not available. These are only approved for non-food contact surfaces.**

Product Name	Type Application	Unit	Item Number	Active Ingredients	Ecolab Code	EPA #	Organic?	N List?	Disinfection (or as a Vir	Sanitize : Dilution and	Safety
Geron IV	Quat Sanitizer/Disinfectant. Dilution needed before use.	5gal	ADP5044	Alkyl (50% C14, 40% C12, 30% C16) Dimethyl Benzyl, Dodecyl Dimethyl, Didecyl Dimethyl, Dioctyl Dimethyl Ammonium chloride.	Quorum Clear V	10B24 137	No	Yes	Disinfection (or as a Virucide): Apply 3 fl. oz. per 5 gal. of water (450 ppm active) and 10 minutes. Treated surfaces must remain wet for 10 minutes.	Immerse cleaned equipment in a solution of 0.75-2 fl. oz. of this product per 4 gal. of water (130-400 ppm active quat) (or equivalent use dilution) for at least 1 minute. Allow sanitized surfaces to adequately drain before contact with food.	This chemical has more significant health (acute) concerns. Sites who use them need to be aware of the PPE requirements. Sites must review the SDSs prior to using the chemicals and follow the precautions.
		55gal	ADP5048				No	Yes			
		32.5gal	ADP5040				No	Yes			
San-tec 6	PAA Sanitizer/Disinfectant	5gal	ADP7914	Peracetic acid, Hydrogen Peroxide	Oxonia Active	63638.1	Yes	No	Use at 0.38% 3.0% v/v (0.43 3.17% w/w or 238 1,885 ppm POAA) (1.5 20 fl. oz. per 5 gallons of water). Surfaces must remain wet for 10 minutes. For food contact surface disinfection, first disinfect, then apply a sanitizing solution to	Use at 0.38% 3.0% v/v (0.43 3.17% w/w or 238 1,885 ppm POAA) (1.5 20 fl. oz. per 5 gallons of water). Surfaces must remain wet for 10 minutes. For food	This chemical has more significant health (acute) concerns. Sites who use them need to be aware of the PPE requirements. Sites must review the SDSs prior to using the chemicals and follow the precautions.
		33.5 gal	ADP7918				Yes	No			
		300gal	ADP7910				Yes	No			
Derma-san	Hand Sanitizer	4/1gal	ADP0006	Benzalkonium chloride	NA		NA	No	N/A	N/A	Review SDS and Label
Alpet D2 Quat	Organic RTU Surface Sanitizer	5gal or 5pony bottles		52% Ethanol, 7% Isopropyl	NA	73232.4	Yes	No	RTU Surface Sanitizer, 1 min	RTU Surface Sanitizer, 1 min	Flammable product. Sites who use them need to be aware of the PPE requirements. Sites must review the SDSs prior to using the chemicals and follow the precautions.
Dermatize	Antibacterial Handwash	4/1gal	ADP0004	Benzethonium chloride	NA		NA	No	N/A	N/A	Review SDS and Label

## **Markham COVID 19 Mitigation of Exposure Risk**

Risk of Exposure must be mitigated through social distancing (6-ft separation, no small groups), breaking up of teams into individual units and into individual areas, to the maximum extent practicable (e.g., bin building teams should have dedicated partners and not switch, packaging teams should not be in physical proximity to the warehouse team, etc.). All employees not working alone in an office or vehicle, must wear a cloth facial covering. Facemasks are required when working within 6-ft of a colleague.

Production efficiency is less important than distancing. If this isn't done, and a person who normally moves throughout the location is later diagnosed with COVID-19, they have forced more extensive cleaning and a longer shutdown. Coaching conversations should be taking place when these mitigation steps are not being followed by individuals.

In short, provide guidance in plants/stations to limit areas of activity to essential role required presence. Fraternalization and visiting in departments outside an employee's "normal" work area should not be allowed.

### **Guidance and Forms**

<https://www.governor.wa.gov/sites/default/files/COVID19AgriculturalSafetyPlan.pdf>

<https://www.lni.wa.gov/agency/docs/wacoronavirushazardconsiderationemployers.pdf>

<https://www.lni.wa.gov/forms-publications/F414-166-000.pdf>

<https://www.lni.wa.gov/forms-publications/F414-165-000.pdf>

<https://www.lni.wa.gov/forms-publications/F414-168-000.pdf>

<https://www.doh.wa.gov/Portals/1/Documents/1600/coronavirus/ClothFacemasks.pdf>

<https://www.cdc.gov/coronavirus/2019-ncov/downloads/stop-the-spread-of-germs-11x17-en.pdf>

<https://www.cdc.gov/coronavirus/2019-ncov/downloads/COVID19-symptoms-11x17-en.pdf>



**EMERGENCY RESPONSE  
PLAN**

**FOR:**

**Ocean Spray Cranberry  
Aberdeen, Washington**

**June 6, 2019**

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## Attachments

- Appendix A – XNG CNG Safety Data Sheet
  - Appendix B – XNG CNG Station Drawings
  - Appendix C – Hexagon Lincoln CNG Trailer
  - Appendix D – Not Used
  - Appendix E – XNG Ocean Spray Station Operation Emergency Contact List
  - Appendix F – Not Used
  - Appendix G – XNG CNG Transfer Procedure
  - Appendix H – Not Used
  - Appendix X-I – XNG Probable Scenario 1 Study Data
  - Appendix X-II – XNG Probable Scenarios 2 Study Data
  - Appendix X-III – XNG Worst Case Scenario 1 Study Data
  - Appendix X-IV – XNG Worst Case Scenario 2 Study Data
  - Appendix Z – XNG Incidence Response Form
-

## **1 INTRODUCTION:**

This plan is designed to meet the requirements of NFPA 55, 59 and 59A. It will be used to ensure that Xpress Natural Gas (XNG) acts in a manner consistent with the intent to protect public safety, property and the environment in the event of an incident involving the Compressed Natural Gas (CNG).

It is XNG's policy that all employees have a good understanding of the content of this plan, know their role, and responsibilities. It is also important that employees be aware of the roles which other individuals and/or firms may play. In addition, for key personnel to be familiar with emergency equipment, where it is located and how to access it quickly; to act in an efficient and cooperative manner when called upon during an emergency.

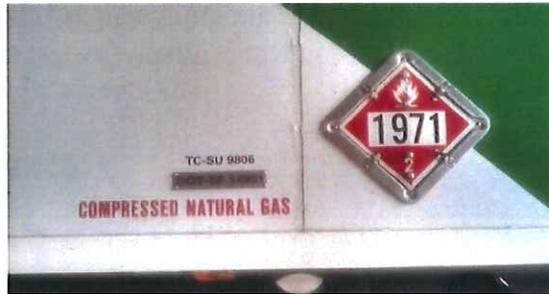
This Emergency Response Plan is available for inspection by the authority having jurisdiction, Ocean Spray, upon reasonable notice to Colin Giles, Xpress Natural Gas Safety & Environmental Director. Colin Giles can be contacted via email at [cgiles@xng.com](mailto:cgiles@xng.com) or telephone number at (857) 319-2038.

## **2 SCOPE:**

The Ocean Spray Cranberries XNG CNG Station is located at 1480 St Route 105 Aberdeen WA uses Natural Gas (NG) is used to fuel its operations. Xpress Natural Gas LLC delivers the CNG, to the Ocean Spray Cranberries XNG CNG Station. CNG is delivered in DOT approved Titan ISO Assembly 40 foot Trailers, containing four composite cylinders holding a total of up to 16,268 pounds of CNG. The Trailers are connected to an available hose station by a composite reinforced CNG rated service hose and an operator activates the hose station allowing the gas to flow out of the trailer. From the trailers, the gas flows into the decompression shed where it is directed into an external gas heater. Once the gas is heated, it goes through a series of two pressure cuts in order to meet the agreed upon customer delivery pressure.

### 3 HAZARD IDENTIFICATION LABELING

The Ocean Spray Cranberries XNG CNG Station receives its Compressed Natural Gas (CNG) from Xpress Natural Gas via XNG CNG Trailers. The CNG is off loaded from the XNG CNG Trailers, decompressed and metered as Natural Gas to PTPC Operations. All the XNG CNG Trailers are labeled and placarded to meet U.S. Department of Transportation Regulations with red text reading “COMPRESSED NATURAL GAS,” a Flammable 2 Placard with the Identification Number “1971” in black text over a white background, and US DOT Special Permit DOT-SP 14951 and Transport Canada Special Permit TC-SU 9806. This is shown in the image below.



Natural Gas, Compressed, Class 2.1, UN1971, PG N/A

#### 4 QUANTITY OF COMPRESSED NATURAL GAS ON SITE

The Ocean Spray Cranberries CNG Station has Three (3) unloading bays for the CNG trailers. During normal operation, one slot will be reserved, empty, for the next full CNG trailer to be delivered. However, during high-flow, cold weather conditions, it may be necessary for Three (3) trailers to be on-site. One flowing gas and one in reserve to support the load while the other one is replaced with full trailers. Therefore, the theoretical maximum number of trailers on-site is Three (3) and the maximum quantity of gas is shown below.

During four-truck operations, the tractor doing the switching of trailers will arrive with no trailer and move one of the empty trailers off-site. With an empty bay, the switching of empties with full will continue as usual until 6 loaded trailers are again on-site.

<u>Slot No.</u>	<u>Maximum CNG (pounds)</u>
1	16,363
2	16,363
3	16,363

**Totals: 3 Trailers                      49,089 pounds**

#### 5 EMERGENCY EQUIPMENT:

##### 5.1 **Emergency Equipment at Ocean Spray Cranberry Station**

##### 5.1.1 Emergency Shut-Down (ESD) Push Buttons:

There are **3 ESD** Buttons that when depressed will cease the unloading of the compressed natural gas from the XNG CNG Trailers, shut off the power to the station, and extinguish all heater pilot lights. Their locations are given below and they can be seen in

1. On the control Panel Door
2. On the process room exterior by the door
3. On the boiler room exterior by the door

### 5.1.2 Combustive Vapor Detectors:

There is two (2) Combustive Vapor Detectors. Its locations in the decompression station on the boiler and gas side

### 5.1.3 Portable Handheld 20 lb. ABC Dry Chemical Fire

Extinguishers: There are 3 Portable Handheld 20 lb.

ABC Dry Chemical Fire

Extinguishers at the Ocean Spray Cranberries. Their locations are given below

1. On each trailer onsite
2. Located outside the process room door
3. Located on or near the trailer unloading Station

## 5.2 Emergency Equipment on Board XNG CNG Trailers:

### 5.2.1 Fire Protection System

Pressure Relief Device (PRD) is used to vent the contents of the vessels in case of fire. This particular PRD system is ***thermally activated*** and consists of 4 temperature-sensitive trigger lines that run the length of the container.

The system is initially filled to 10.3 bar (150 psig), but may need to be re-filled in accordance with Section 10.1 below. The system is designed such that in the event of a fire, the trigger lines will activate several valves to open and vent the entire contents of the module. The contents of all four cylinders will vent once any one line is triggered. Venting the contents of all the cylinders may take up to 45 minutes. The vent lines have spring-loaded pressure relief caps to prevent moisture and debris from contaminating the valves.

The system is also designed to compensate for small leaks/pressure loss over long periods of time to prevent accidental venting of the container.

### 5.2.2 Mechanical Spring Pressure Relief Devices

There are four (4) Pressure Relief Devices set at 4500 psi on each

pressure vessel. The devices are meant to vent down contents of the cylinders in an emergency situation, this will serve as the primary prevention of cylinder failure due to over-pressurization. These valves are only active when the cylinders are either being filled or off-loaded.

#### 5.2.3 Portable Handheld 20 lb. ABC Dry Chemical Fire Extinguisher

There is one (1) Portable Handheld 20 lb. ABC Dry Chemical Fire Extinguisher on each CNG Trailer. It is located on the chassis towards the front of the Trailer on the Driver's side.

#### 5.2.4 Side Panels

In addition, the TITAN™ side panels and covers protect the cylinders from weather, sunlight, tampering, service conditions, vandalism, and damage caused during transportation. They provide a way for the owner or user to visually check to see if any major damage has occurred. The side covers also protect the fire protection system. During a fire, the side covers shield the cylinders from direct exposure to the flame and radiant heat. This gives the fire protection system time to vent the contents of the cylinders before degradation of the cylinders occurs.

#### 5.2.5 Ridge Vents

Along both side panels, approximately one (1) foot from the roof of the module are ridge vents that allow venting of the interior space of the module. The purpose is to prevent an atmosphere within the flammable range (LFL to UFL) inside the module.

#### 5.2.7 Emergency Shut-Off System

The trailers are equipped with a mechanical shut-off system that stops the flow of gas from all four tanks without having to close the valves by hand from the rear of the trailer. This system is activated by 1) either of two eutectic plugs (heat sensitive plugs that activate at 225 degree F) located in the tubing at the rear of the trailer, or 2) either of two remote handles located at the front-right and front-left corners of the trailer behind small access covers.

## **6 INCIDENTS**

## 6.1 Types of Incidents

From Xpress Natural Gas's compressing station in New Washington, XNG ships CNG at a maximum of 16,000 pounds per delivery. These deliveries are made in the Northwest through XNG transport vehicles. Transportation of CNG may take place at any hour of the day and XNG provides a 24-hour manned emergency response line. The local fire chief or designee has statutory authority over all emergencies and will have the final decision related to any response procedures. In addition, XNG has contracted with Clean Harbors for on call assistance in the event of a CNG emergency. The type of problem which XNG may be required to respond to include:

1. Incident requiring transfer of contents of CNG Cylinder to an alternate XNG CNG Trailer
2. Incident with or without injuries, CNG cylinder leaking, requiring venting
3. Incident with fire and potential for ignition
4. Incident with small ignited leak
5. Incident with ignition and tank rupture

In an event of an incident, XNG will advise and supervise one of three different procedures. These procedure are

1. Complete venting of CNG Vessels
2. Controlled Emergency Venting of the Trailer
3. A transfer of CNG from one vessel to another  
- See Appendix G for procedure

## 6.2 How XNG Handles Incidents

Our actions, through advice to first responders on the scene or company personnel at the site will always be carried out keeping in mind safety of the public and personnel. Public evacuations and road closures as a result of incidents with CNG are inconvenient, costly and potentially very hazardous. Our aim through timely and effective action is to reduce the risk to the public, property and enviro PTPC from the hazards of the flammable products we carry if there ever is an incident. This is done by:

### 6.2.1 Before an Incident

1. Aiding Emergency Responders in Pre-Emergency Planning
2. Identifying Locations of CNG and NG at the Ocean Spray CNG Station

3. Accessing CNG and NG Material Safety Data Sheets (SDS) See Appendix A for SDS Sheets
4. Knowing the Ocean Spray CNG Station Emergency Procedures

#### 6.2.2 During an Incident

1. Advising first responders on the hazards of CNG
2. Advising first responders on firefighting options, if necessary
3. Advising first responders on evacuation distances, assisting them to accomplish this and in extremely urgent situations, acting to do so ourselves.

Any adjustment or fixes to the XNG CNG Trailers must be made by a qualified employee of XNG or Hexagon Lincoln.

### 6.3 **Recovery Considerations**

A compromised trailer should be allowed to vent until completely empty before attempting to remove the container from the site. No effort should be made to recover the gas left in a compromised container.

### 6.4 **Evacuations Procedures**

Along public highways or within municipalities, advise the first emergency responders at the scene (police or fire) of the need to evacuate using the guidance in the Emergency Response Guidebook (ERG) and this Emergency Response Plan (ERP) document. It is the responsibility of municipal authorities to initiate such actions but it is vitally important they understand the circumstances and take the appropriate evacuation actions if there is danger of an explosion. Employees at the scene should assist local emergency services to the best of their ability to accomplish this. However, if action is immediately required and there are no emergency services on scene, enlist the help of others to prevent access into the hazard zone until such time as the fire department or police arrive.

### 6.5 **XNG Scenario Study**

Xpress Natural Gas has compiled four separate scenarios in order to model and present the consequences of an emergency situation. The first two scenarios are considered

the most probable emergency situation which an operator may encounter during the life of the station. The last two emergency situations are modeled as a worst case scenario which XNG considers extremely rare and unlikely to happen during the life of this station.

6.5.1 Probable Scenario 1

**A Small CNG leak** at a Swagelok fitting, Valve, Relay or the CNG hose. See appendix X-I for data.

6.5.2 Probable Scenario 2

The inadvertent **Emergency Venting** of the XNG CNG trailer due to fire protection system pressure control loss. See appendix X-II for data.

6.5.3 Worst Case Scenario 1

**Complete Hose Failure** between XNG CNG Trailer Connection and CNG unloading Station Connection and leaks CNG. See appendix X-III for data.

6.5.4 Worst Case Scenario 2

**Complete Hose Failure with Fire** between XNG CNG Trailer Connection and CNG unloading Station Connection compounded with a XNG CNG trailer **Chassis Fire**. See appendix X-IV

6.5.5 Reference Tables

Exposure to thermal radiation has different effects on personnel. The following table lists the effects of thermal radiation. It was obtained from *The Introduction to Fire Dynamics*, Drysdale, Table 2.8

Radiant Heat Flux kW/m <sup>2</sup>	Observed Effect
0.67	Summer sunshine in UK
1	Maximum for indefinite skin exposure
6.4	Pain after 8 seconds of skin exposure
10.4	Pain after 3 seconds of exposure
12.5	Volatiles from wood may be ignited by pilot after prolonged exposure
16	Blistering of skin after 5 seconds

29	Wood ignites spontaneously after prolonged exposure
52	Firebrand ignites spontaneously in 5 seconds

NFPA 59 establishes levels of radiant heat flux limits to property lines, they are shown in the table below.

Radiant Heat Flux kW/m <sup>2</sup>	Exposure
5	A property line at ground level that can be built upon for ignition of a design spill.
5	The nearest point located outside the owner's property line at ground level that, at the time of plant siting, is used for outdoor assembly by groups of 50 or more persons for a fire in an impounding area
9	The nearest point on the building or structure outside the owner's property line that is in existence at the time of plant siting and used for assembly, educational, health care, detention and correction, or residential occupancies for a fire in an impounding area.
30	A property line at ground level that can be built upon for a fire over and impounding area

NFPA 59 also establishes Heat Flux and Thermal Dosage Outside the Plant Boundary.  
Table 15.8.4.1

Radiant Heat Flux kW/m <sup>2</sup>	Maximum Modified Dosage Unit ([kW/m <sup>2</sup> ] <sup>3/4</sup> t)	Exposure
5	500	At least 0 persons would suffer 2 <sup>nd</sup> degree skin burns on at least 10% of their bodies within 30 seconds of exposure to the fire.
5	300	At least one person inside the building would suffer 2 <sup>nd</sup> degree skin burns on at least 10% of the body within 30 seconds of exposure to the fire.
32	N/A	Loss of strength of structural steel exposed to the fire to an extent that its primary load-bearing capacity is reduced significantly over the duration of LNG fire being analyzed.



**1 Identification**

- **Product identifier**
- **Trade name:** Natural Gas, Dry
- **CAS Number:**  
68410-63-9
- **Other means of identification:** Methane, Petroleum Gas, Methyl Hydride, Treated Gas, Process Gas
- **Recommended use and restriction on use**
- **Recommended use:** Fuel
- **Restrictions on use:** No relevant information available.
- **Details of the supplier of the Safety Data Sheet**
- **Manufacturer/Supplier:**  
Xpress Natural Gas LLC  
300 Brickstone Sq St 1005  
Andover Ma, 01810  
USA  
857-(233-5329Toll-Free)  
cgiles@xng.com
- **Emergency telephone number:**  
Xpress Natural Gas Operational Control Center  
1- 857-366-7981(US/Canada)

**2 Hazard(s) identification**

- **Classification of the substance or mixture**  
Flam. Gas 1      H220 Extremely flammable gas.  
Press. Gas      H280 Contains gas under pressure; may explode if heated.  
Simple Asphyxiant      May displace oxygen and cause rapid suffocation.
- **Label elements**
- **GHS label elements**  
The product is classified and labeled according to the Globally Harmonized System (GHS).
- **Hazard pictograms:**  
   
GHS02 GHS04
- **Signal word:** Danger
- **Hazard statements:**  
H220 Extremely flammable gas.  
H280 Contains gas under pressure; may explode if heated.  
May displace oxygen and cause rapid suffocation.
- **Precautionary statements:**  
P210      Keep away from heat/sparks/open flames/hot surfaces. - No smoking.  
P377      Leaking gas fire: Do not extinguish, unless leak can be stopped safely.  
P381      Eliminate all ignition sources if safe to do so.  
P410+P403      Protect from sunlight. Store in a well-ventilated place.

## Safety Data Sheet

acc. to OSHA HCS (29CFR 1910.1200) and WHMIS 2015 Regulations

Printing date: November 15, 2018

Revision: November 15, 2018

**Trade name: Natural Gas, Dry**

(Cont'd. of page 1)

· **Other hazards** There are no other hazards not otherwise classified that have been identified.

### 3 Composition/information on ingredients

· **Chemical characterization: Substances**

· **CAS No. Description**  
68410-63-9 Natural gas

· **Components:**

75-08-1	ethyl mercaptan (if odorized)	 Flam. Liq. 2, H225  Acute Tox. 4, H302; Acute Tox. 4, H332	<0.1%
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· **Additional information:**

For the listed ingredient(s), the identity and/or exact percentage(s) are being withheld as a trade secret.  
For the wording of the listed Hazard Statements, refer to section 16.

### 4 First-aid measures

· **Description of first aid measures**

· **After inhalation:**

Supply fresh air.  
Provide oxygen treatment if affected person has difficulty breathing.  
If experiencing respiratory symptoms: Call a poison center/doctor.

· **After skin contact:**

In cases of frostbite from liquefied gas or from high-pressure systems, rinse with plenty of water. Do not remove clothing.

· **After eye contact:**

Remove contact lenses if worn.  
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.

· **After swallowing:** Unlikely route of exposure.

· **Most important symptoms and effects, both acute and delayed:**

Dizziness  
Coughing  
Frostbite from liquefied gas or high-pressure systems.  
Disorientation

· **Danger:** May displace oxygen and cause rapid suffocation.

· **Indication of any immediate medical attention and special treatment needed:**

If necessary oxygen respiration treatment.

### 5 Fire-fighting measures

· **Extinguishing media**

· **Suitable extinguishing agents:**

Foam  
Water fog / haze  
Gaseous extinguishing agents  
Carbon dioxide

· **For safety reasons unsuitable extinguishing agents:** Water stream.

(Cont'd. on page 3)

## Safety Data Sheet

acc. to OSHA HCS (29CFR 1910.1200) and WHMIS 2015 Regulations

Printing date: November 15, 2018

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**Trade name: Natural Gas, Dry**

(Cont'd. of page 2)

- **Special hazards arising from the substance or mixture**  
Danger of receptacles bursting because of high vapor pressure if heated.  
Extremely flammable gas.
- **Advice for firefighters**
- **Protective equipment:**  
Wear self-contained respiratory protective device.  
Wear fully protective suit.
- **Additional information:**  
Eliminate all ignition sources if safe to do so.  
In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.  
Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

### 6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**  
Wear protective equipment. Keep unprotected persons away.  
Ensure adequate ventilation.  
Keep away from ignition sources.  
Take precautionary measures against static discharge.  
Use only non-sparking tools.  
Protect from heat.  
For large spills, use respiratory protective device against the effects of fumes/dust/aerosol.
- **Environmental precautions** No special measures required.
- **Methods and material for containment and cleaning up** Allow to evaporate.
- **Reference to other sections**  
See Section 7 for information on safe handling.  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

### 7 Handling and storage

- **Handling**
- **Precautions for safe handling:** Use enclosed means of conveyance.
- **Information about protection against explosions and fires:**  
Keep ignition sources away - Do not smoke.  
Protect against electrostatic charges.  
Ground/bond container and receiving equipment.  
Emergency cooling must be available in case of nearby fire.  
Flammable gas-air mixtures may be formed in empty containers/receptacles.
- **Conditions for safe storage, including any incompatibilities**
- **Requirements to be met by storerooms and receptacles:**  
Avoid storage near extreme heat, ignition sources or open flame.
- **Information about storage in one common storage facility:** Store away from oxidizing agents.
- **Further information about storage conditions:**  
Store in a cool place. Heat will increase pressure and may lead to the receptacle bursting.
- **Specific end use(s)** No relevant information available.

(Cont'd. on page 4)

## Safety Data Sheet

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**Trade name: Natural Gas, Dry**

(Cont'd. of page 3)

### 8 Exposure controls/personal protection

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**

**68410-63-9 Natural gas, dried**

TLV (USA)	refer to App. F in TLVs and BEIs book; NIC-D, EX
EL (Canada)	Simple asphyxiant, EX
EV (Canada)	Long-term value: 1,000 ppm revoked as of 01/01/18
LMPE (Mexico)	Long-term value: 1000 ppm

**75-08-1 ethyl mercaptan**

PEL (USA)	Ceiling limit value: 25 mg/m <sup>3</sup> , 10 ppm
REL (USA)	Ceiling limit value: 1.3* mg/m <sup>3</sup> , 0.5* ppm *15 min
TLV (USA)	Long-term value: 1.3 mg/m <sup>3</sup> , 0.5 ppm
EL (Canada)	Long-term value: 0.5 ppm
EV (Canada)	Long-term value: 1.3 mg/m <sup>3</sup> , 0.5 ppm
LMPE (Mexico)	Long-term value: 0.5 ppm

· **Exposure controls**

· **General protective and hygienic measures:**

The usual precautionary measures for handling chemicals should be followed.  
Keep away from foodstuffs, beverages and feed.  
Wash hands before breaks and at the end of work.

· **Engineering controls:** Provide adequate ventilation.

· **Breathing equipment:**

Not required under normal conditions of use.



Self-contained respiratory protective device should be used in case of large spills or leaks.

· **Protection of hands:**

Wear gloves for protection against thermal and mechanical hazards according to OSHA and NIOSH rules.

· **Eye protection:**



Safety glasses

Follow relevant national guidelines concerning the use of protective eyewear.

· **Body protection:** Wear appropriate protective clothing.

· **Limitation and supervision of exposure into the environment**

No relevant information available.

· **Risk management measures** No relevant information available.

### 9 Physical and chemical properties

(Cont'd. on page 5)

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**Trade name: Natural Gas, Dry**

(Cont'd. of page 4)

· **Information on basic physical and chemical properties**

· **Appearance:**

**Form:** Gaseous

**Color:** Colorless

· **Odor:** Normally odorless. Pungent odor observed if mercaptans are present.

· **Odor threshold:** Not determined.

· **pH-value:** Not determined.

· **Melting point/Melting range:** Not determined.

· **Boiling point/Boiling range:** Not determined.

· **Flash point:** -184 °C (-299.2 °F)

· **Flammability (solid, gaseous):** Extremely flammable gas.

· **Auto-ignition temperature:** 537 °C (998.6 °F)

· **Decomposition temperature:** Not determined.

· **Danger of explosion:** Product is not explosive. However, formation of explosive air/vapor mixtures are possible.

· **Explosion limits**

**Lower:** 2 Vol %

**Upper:** 10 Vol %

· **Oxidizing properties:** Not determined.

· **Vapor pressure at 25 °C (77 °F):** 40 mmHg (0.77 psi)

· **Density:**

**Relative density:** Not determined.

**Vapor density:** Not determined.

**Relative vapor density at 20 °C (68 °F):** 0.5 (air = 1)

**Evaporation rate:** Not applicable.

· **Solubility in / Miscibility with**

**Water:** Not miscible or difficult to mix.

· **Partition coefficient (n-octanol/water):** Not determined.

· **Viscosity**

**Dynamic:** Not determined.

**Kinematic:** Not determined.

· **Other information** No relevant information available.

### 10 Stability and reactivity

· **Reactivity:** No data available for self-reactivity.

· **Chemical stability:** Stable under normal temperatures and pressures.

· **Thermal decomposition / conditions to be avoided:**

    Danger of receptacles bursting because of high vapor pressure if heated.

· **Possibility of hazardous reactions**

(Cont'd. on page 6)

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**Trade name: Natural Gas, Dry**

(Cont'd. of page 5)

Extremely flammable gas.  
 Reacts with halogenated compounds.  
 Develops readily flammable gases / fumes.  
 Reacts with oxidizing agents.  
 Can form explosive mixtures in air if heated above flash point and/or when sprayed or atomized.  
 Hazardous gases may be released if heated above the decomposition point.

· **Conditions to avoid**

Excessive heat.  
 Keep ignition sources away - Do not smoke.

· **Incompatible materials**

Oxidizers  
 Halogenated compounds.

· **Hazardous decomposition products**

Under fire conditions only:  
 Carbon monoxide and carbon dioxide

### 11 Toxicological information

· **Information on toxicological effects**

- **Acute toxicity:** Based on available data, the classification criteria are not met.
- **LD/LC50 values that are relevant for classification:** None.
- **Primary irritant effect:**
- **On the skin:** Based on available data, the classification criteria are not met.
- **On the eye:** Based on available data, the classification criteria are not met.
- **Sensitization:** Based on available data, the classification criteria are not met.

· **IARC (International Agency for Research on Cancer):**

Substance is not listed.

· **NTP (National Toxicology Program):**

Substance is not listed.

· **OSHA-Ca (Occupational Safety & Health Administration):**

Substance is not listed.

· **Probable route(s) of exposure:**

Inhalation.  
 Eye contact.  
 Skin contact.

· **Acute effects (acute toxicity, irritation and corrosivity):**

May displace oxygen and cause rapid suffocation.

- **Germ cell mutagenicity:** Based on available data, the classification criteria are not met.
- **Carcinogenicity:** Based on available data, the classification criteria are not met.
- **Reproductive toxicity:** Based on available data, the classification criteria are not met.
- **STOT-single exposure:** Based on available data, the classification criteria are not met.
- **STOT-repeated exposure:** Based on available data, the classification criteria are not met.
- **Aspiration hazard:** Based on available data, the classification criteria are not met.

### 12 Ecological information

(Cont'd. on page 7)

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**Trade name: Natural Gas, Dry**

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- **Toxicity**
- **Aquatic toxicity** No relevant information available.
- **Persistence and degradability** No relevant information available.
- **Bioaccumulative potential:** No relevant information available.
- **Mobility in soil:** No relevant information available.
- **Additional ecological information**
- **General notes:** Not known to be hazardous to water.
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects** No relevant information available.

#### 13 Disposal considerations

- **Waste treatment methods**
- **Recommendation:**  
Contact waste processors for recycling information.  
The user of this material has the responsibility to dispose of unused material, residues and containers in compliance with all relevant local, state and federal laws and regulations regarding treatment, storage and disposal for hazardous and nonhazardous wastes.
- **Uncleaned packagings**
- **Recommendation:** Disposal must be made according to official regulations.

#### 14 Transport information

- **UN-Number**
- **DOT, ADR, IMDG, IATA** UN1971
- **UN proper shipping name**
- **DOT, IATA** Natural gas, compressed
- **ADR, IMDG** NATURAL GAS, COMPRESSED
- **Transport hazard class(es)**
- **DOT**
- 
- **Class** 2.1
- **Label** 2.1
- **ADR**
- 

(Cont'd. on page 8)

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(Cont'd. of page 7)

· Class	2.1 1F
· Label	2.1
· IMDG, IATA	
	
· Class	2.1
· Label	2.1
· Packing group	This UN-number is not assigned a packing group.
· Environmental hazards	
· Marine pollutant:	No
· Special precautions for user	
· Danger code (Kemler):	21
· EMS Number:	F-D,S-U
· Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	
Not applicable.	
· Transport/Additional information:	
· IATA	
	
Cargo Aircraft Only.	

#### 15 Regulatory information

· Safety, health and environmental regulations/legislation specific for the substance or mixture

· United States (USA)

· SARA

· Section 302 (extremely hazardous substances):

Substance is not listed.

· Section 355 (extremely hazardous substances):

Substance is not listed.

· Section 313 (Specific toxic chemical listings):

Substance is not listed.

· TSCA (Toxic Substances Control Act)

Substance is listed.

· Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):

75-08-1 ethyl mercaptan

10000

· Proposition 65 (California)

(Cont'd. on page 9)

**Safety Data Sheet**

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**Trade name: Natural Gas, Dry**

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**· Chemicals known to cause cancer:**

Substance is not listed.

**· Chemicals known to cause developmental toxicity for females:**

Substance is not listed.

**· Chemicals known to cause developmental toxicity for males:**

Substance is not listed.

**· Chemicals known to cause developmental toxicity:**

Substance is not listed.

**· EPA (Environmental Protection Agency):**

Substance is not listed.

**· IARC (International Agency for Research on Cancer):**

Substance is not listed.

**· Canadian Domestic Substances List (DSL) (Substances not listed.):**

Substance is listed.

**16 Other information**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

**· Abbreviations and acronyms:**

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

CAS: Chemical Abstracts Service (division of the American Chemical Society)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bio-accumulable, Toxic

vPvB: very Persistent and very Bioaccumulative

OSHA: Occupational Safety &amp; Health Administration

Flam. Gas 1: Flammable gases – Category 1

Press. Gas: Gases under pressure – Compressed gas

Flam. Liq. 2: Flammable liquids – Category 2

Acute Tox. 4: Acute toxicity – Category 4

**· Sources**

Website, European Chemicals Agency (echa.europa.eu)

Website, US EPA Substance Registry Services (ofmpub.epa.gov/sor internet/registry/substreg/home/overview/home.do)

Website, Chemical Abstracts Registry, American Chemical Society (www.cas.org)

Patty's Industrial Hygiene, 6th ed., Rose, Vernon, ed. ISBN: 978-0-470-07488-6

Casarett and Doull's Toxicology: The Basic Science of Poisons, 8th Ed., Klaassen, Curtis D., ed., ISBN: 978-0-07-176923-5.

Safety Data Sheets, Individual Manufacturers

SDS Prepared by:

ChemTel Inc.

1305 North Florida Avenue

Tampa, Florida USA 33602-2902

Toll Free North America 1-888-255-3924 Intl. +01 813-248-0573

(Cont'd. on page 10)



Xpress Natural Gas

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**Trade name: Natural Gas, Dry**

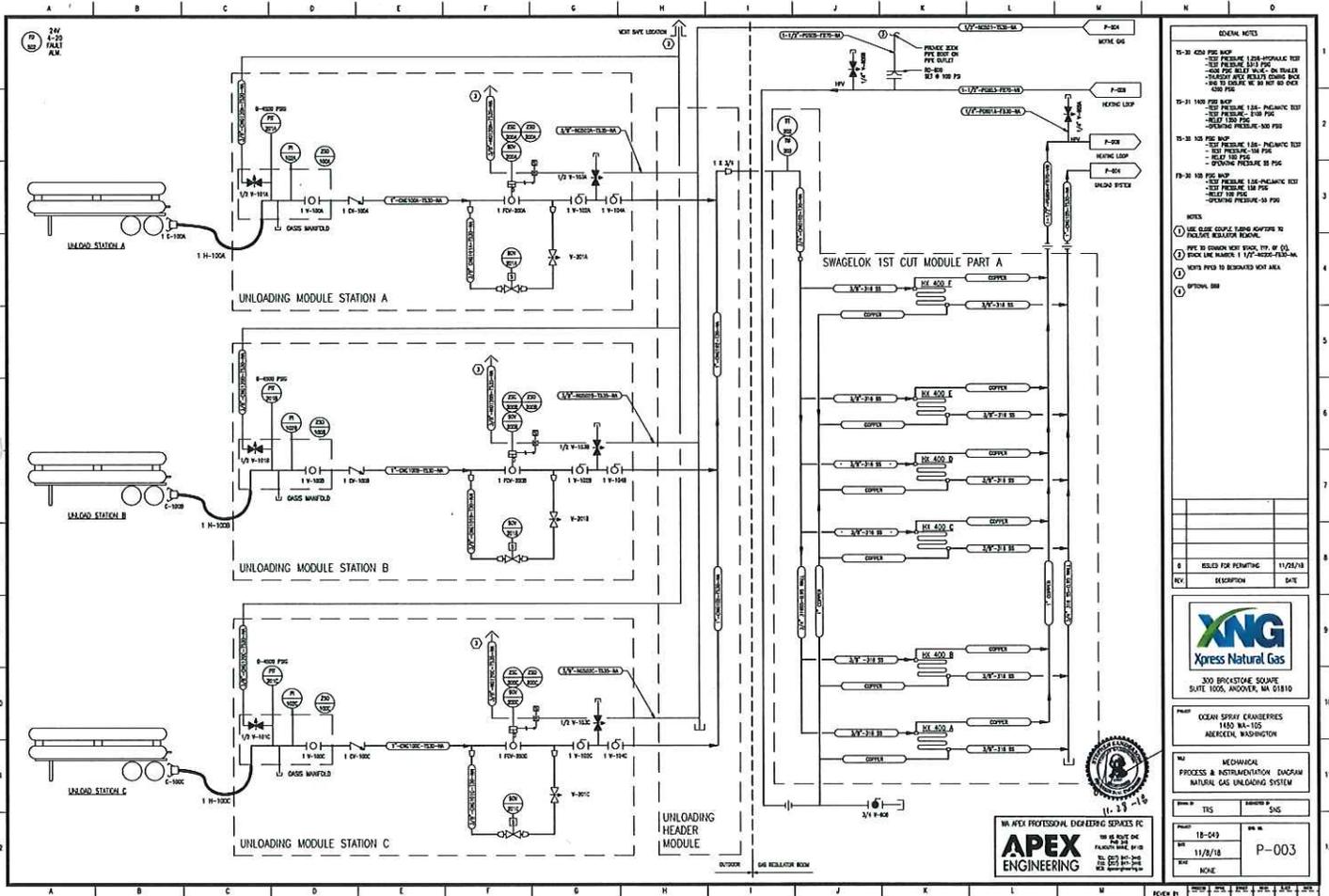
Website: [www.chemtelinc.com](http://www.chemtelinc.com)

(Cont'd. of page 9)









**GENERAL NOTES**

TS-30 400 PSIG SWP  
 -TSI PRESSURE 1.00-INCH NPT/1.00 INCH  
 -TSI PRESSURE 3/4 INCH NPT  
 -TSI PRESSURE 1/2 INCH NPT  
 -TSI PRESSURE 1/4 INCH NPT  
 -TSI PRESSURE 1/8 INCH NPT

TS-31 150 PSIG SWP  
 -TSI PRESSURE 1.00-INCH NPT/1.00 INCH  
 -TSI PRESSURE 3/4 INCH NPT  
 -TSI PRESSURE 1/2 INCH NPT  
 -TSI PRESSURE 1/4 INCH NPT  
 -TSI PRESSURE 1/8 INCH NPT

TS-32 100 PSIG SWP  
 -TSI PRESSURE 1.00-INCH NPT/1.00 INCH  
 -TSI PRESSURE 3/4 INCH NPT  
 -TSI PRESSURE 1/2 INCH NPT  
 -TSI PRESSURE 1/4 INCH NPT  
 -TSI PRESSURE 1/8 INCH NPT

TS-33 50 PSIG SWP  
 -TSI PRESSURE 1.00-INCH NPT/1.00 INCH  
 -TSI PRESSURE 3/4 INCH NPT  
 -TSI PRESSURE 1/2 INCH NPT  
 -TSI PRESSURE 1/4 INCH NPT  
 -TSI PRESSURE 1/8 INCH NPT

NOTES  
 1 USE O-RING COMPATIBLE WITH SERVICE TO PREVENT LEAKAGE  
 2 PIPE TO DESIGN WITH 10% OVER SIZE  
 3 STOCK LINE NUMBER 1 1/2"-1000-PSI-316  
 4 100% PWT TO BE SHOWN WITH AREA  
 5 OPTIONAL

REV	DESCRIPTION	DATE
1	ISSUED FOR PERMITTING	11/05/18



300 BRICKSTONE SQUARE  
 SUITE 1000, ANDOVER, MA 01810

OCEAN SPRING ENGINEERING  
 1450 WA-105  
 ANDERSON, WASHINGTON

NO MECHANICAL  
 PROCESS & INSTRUMENTATION DIAGRAM  
 NATURAL GAS UNLOADING SYSTEM

BY: APEX ENGINEERING  
 PROJECT: 18-049  
 DATE: 11/9/18  
 SHEET: NONE









**HEXAGON  
COMPOSITES**

**Hexagon Composites  
CNG Bulk Hauling TITAN<sup>®</sup>  
Module Operation and  
Inspection Manual  
With NC Gas Venting  
System**

**P/N's: 240167-0001 & 240167-0002  
ECN 33885  
March 09, 2016**

**Service Bulletin 14-02-005 Revision F**



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## 1 Using this Operational Manual

**This manual must be read and understood before using the Hexagon Composites TITAN® Module: P/N: 240167-0001 and 240167-0002.**

The purpose of this document is to provide information about how to operate, maintain, and inspect Hexagon Composites TITAN® Container: P/N: 240167-0001 and 240167-0002. In situations where this document differs from the authority having jurisdiction, the latter shall have precedence.

**Boxed bolded text is used in this manual to indicate critical warnings or instructions. An example of this format is shown above this paragraph.**

Throughout the procedures defined by this manual, figures are used to show the location of components.

**The figures are not to be used as a reference for what position the valves are in (e.g. open vs. closed) unless it is explicitly stated. Failure to comply may result in damage, personal injury, and/or death.**

The checklists in Appendix A, Appendix B, Appendix C are to be copied and reproduced as needed. Contact Hexagon Composites Technical Service Engineering for electronic versions of these checklists. The information recorded in these appendices shall be kept a minimum of 5 years and is recommended to be maintained for the life of the container. The inspection information must be kept for the life of the container. This information must be provided to the person inspecting the container prior to inspection or as directed by the authority having jurisdiction.

## 2 In Case of Emergency Involving Fire or Venting of Cargo

**CALL Emergency Response Telephone Number on Shipping Paper first. If the Shipping Paper is not available or no answer, refer to appropriate telephone number listed on page 44 under the section EMERGENCY RESPONSE TELEPHONE NUMBERS or by the authority having jurisdiction.**

**Hexagon Composites Emergency Number: 844-211-5339**

### 3 Who to Call for Assistance (for first responders)

This section is taken from the Emergency Response Guide (ERG) 2008 Guide # 115 page 7.

Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit. Follow the steps outlined in your organization's standard operating procedures and/or local emergency response plan for obtaining qualified assistance. Generally, the notification sequence and requests for technical information beyond what is available in the ERG 2008 guidebook should occur in the following order.

#### Organization/Agency

Notify your organization/agency which may be the owner and/ or operator of the module. This will set in motion a series of events based upon the information provided. Actions may range from dispatching additional trained personnel to the scene to activating the local emergency response plan. Ensure that local fire and police departments have been notified.

#### Emergency Response Telephone Number

Locate and call the telephone number listed on the shipping document. The person answering the phone at the listed emergency response number must be knowledgeable of the materials and mitigation actions to be taken, or must have immediate access to a person who has the required knowledge.

#### National Assistance

Contact the appropriate emergency response agency listed on the inside back cover of this guidebook when the emergency response telephone number is not available from the shipping papers. Upon receipt of a call describing the nature of the incident, the agency will provide immediate advice on handling the early stages of the incident. The agency will also contact the shipper or manufacturer of the material for more detailed information and request on-scene assistance when necessary.

Collect and provide as much of the following information as can safely be obtained to your chain-of-command and specialists contacted for technical guidance:

- Your name, call back number, FAX number
- Location and nature of problem (spill, fire, etc.)
- Name and identification number of material(s) involved
- Shipper/consignee/point of origin
- Carrier name, rail car, vessel or truck number
- Container type and size
- Quantity of material transported/released
- Local conditions (weather, terrain, proximity to schools, hospitals, waterways, etc.)
- Injuries and exposures
- Local emergency services that have been notified

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#### 4 Key Warnings

*Never smoke near or around this container.*

*Do not allow a vacuum to form in the cylinder(s) at any time.*

*Always ground the plumbing with a 3-gage copper wire or larger to an appropriate ground source at least 8 feet in the ground.*

*The owner is responsible for supplying a break-away connection on the hose.*

*The maximum gas density shall never be exceeded as defined by 250 barg (3626 psig) and 15 °C (59 °F).*

*The maximum gas temperature shall not exceed 82 °C (180 °F).*

*The user is responsible for specifying the minimum height clearance requirement and approved routes.*

*It is the user's responsibility to ensure that their Emergency Response Procedure is followed and is acceptable to the Authority Having Jurisdiction (AHJ).*

**It is the Owner and User's responsibility to ensure the TITAN® systems are being filled with "clean gas". The term "clean gas" used in this manual refers to the gas particulate size range of 3 to 10 microns. Hexagon Composites is not responsible for any failures of any components of the module if this "clean gas" specification is not met.**

**Any valve used on the TITAN® should not be throttled in any way. The throttling of a valve in this manual is defined as change of position of valve stem during gas flow. This can result in erosion of the valve seats and seals. It is the Owner and User's responsibility to ensure throttling of valves is not occurring with their modules. Hexagon Composites is not responsible for any failures of any valves on the TITAN® module if a valve shows signs of throttling.**

5 Basic Layout

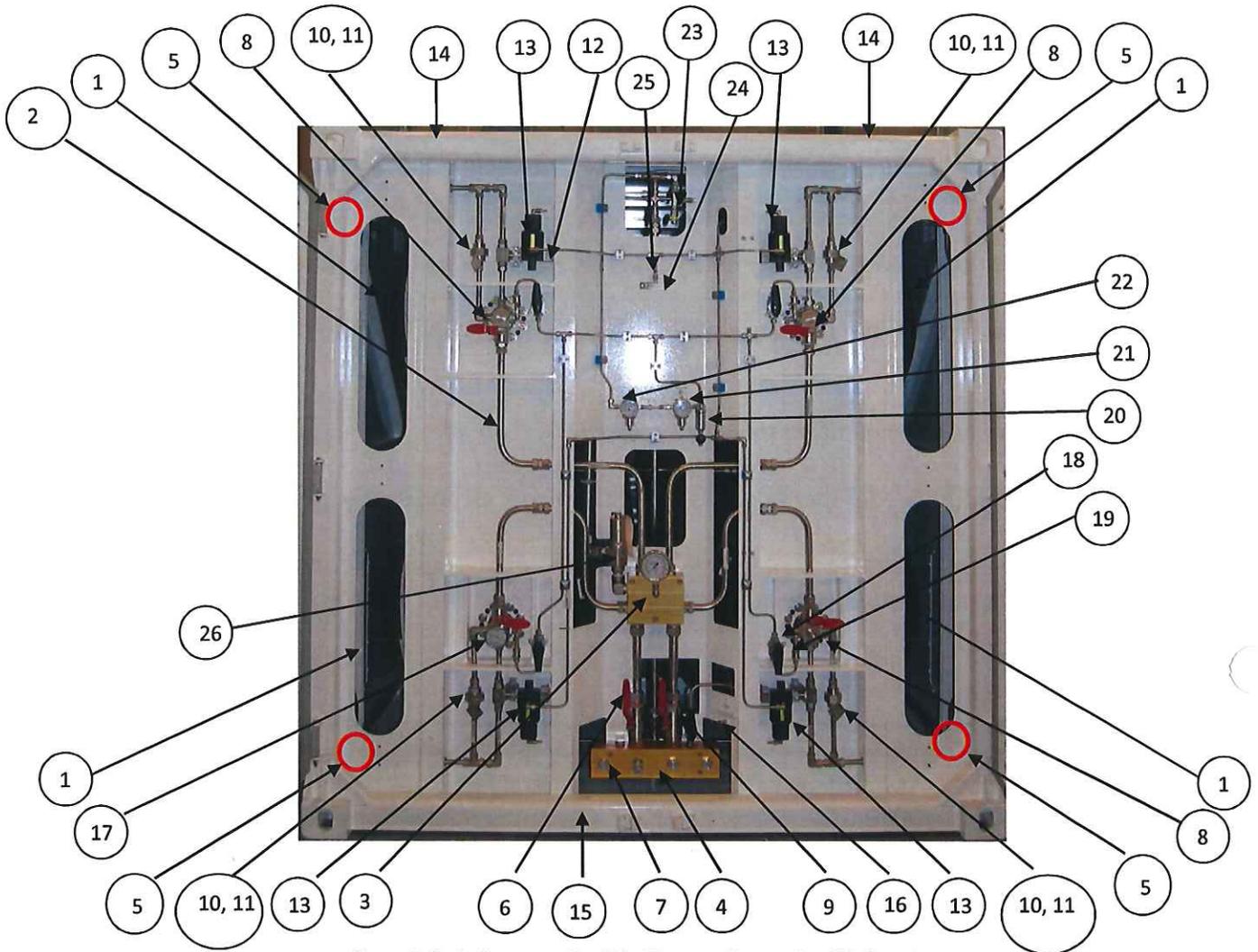


Figure 1: Basic Components of the Hexagon Composites ISO Container.

Table 1: Basic Components of the Hexagon Composites ISO Container

Item No.	Description	Item No.	Description
1	Hexagon Composites Gas Cylinder (qty 4)	14	Vent Lines (qty 4) (not all shown)
2	Cylinder Plumbing	15	Container Frame
3	Distribution Manifold with Pressure Gauge	16	Grounding Lug
4	Filling/Unloading Manifold	17	Temperature Gauge
5	Temperature Sensitive Line (qty 4) (not visible in view)	18	Constant Feed shut ¼ turn valve (qty 4)
6	Manifold Valve (qty 2)	19	Check Valves (qty 4)
7	Quick Disconnects	20	Filter
8	Cylinder Valve (qty 4)	21	Regulator set at 250 psig (17.2 barg)
9	Bleed/ Vent Valve	22	Regulator set at 190 psig (13.1 barg)
10	Burst Disc holder (qty 4)	23	Pressure Relief Valve set at 200 psig (13.8 barg)
11	Burst Disc (qty 4)	24	Container Serial Number Tag
12	Pneumatic Valve mechanical lock (qty 4)	25	0.030" (0.76 mm) Orifice
13	Gas Venting System Pneumatic Valves (qty 4)	26	Pressure Relief Valve set at 4500 psig (310 barg)

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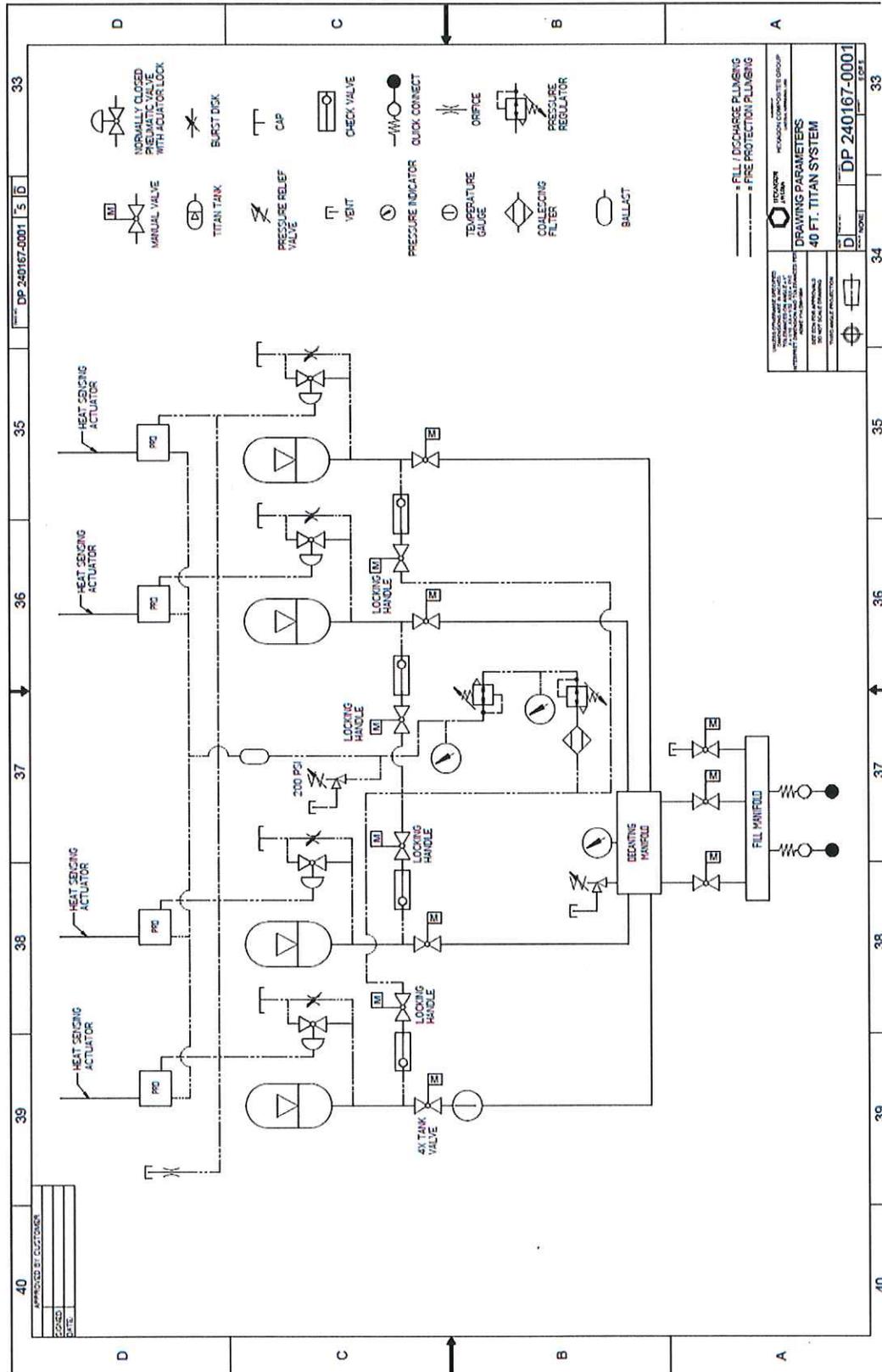


Figure 2: Flow Diagram

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## 6 Description of Cylinder

The design construction type is a fully wrapped carbon fiber-reinforced epoxy composite pressure vessel with a high-density polyethylene (HDPE) liner. The plastic liner is a non-structural barrier for the containment of compressed gas at high pressure. The composite is the primary structural element of the design, supporting internal pressure and mounting loads, and providing the general strength and durability of the vessel. The nickel plated end bosses provide the interface for connecting the vessel to the gas system and are the means by which the vessel is mounted.

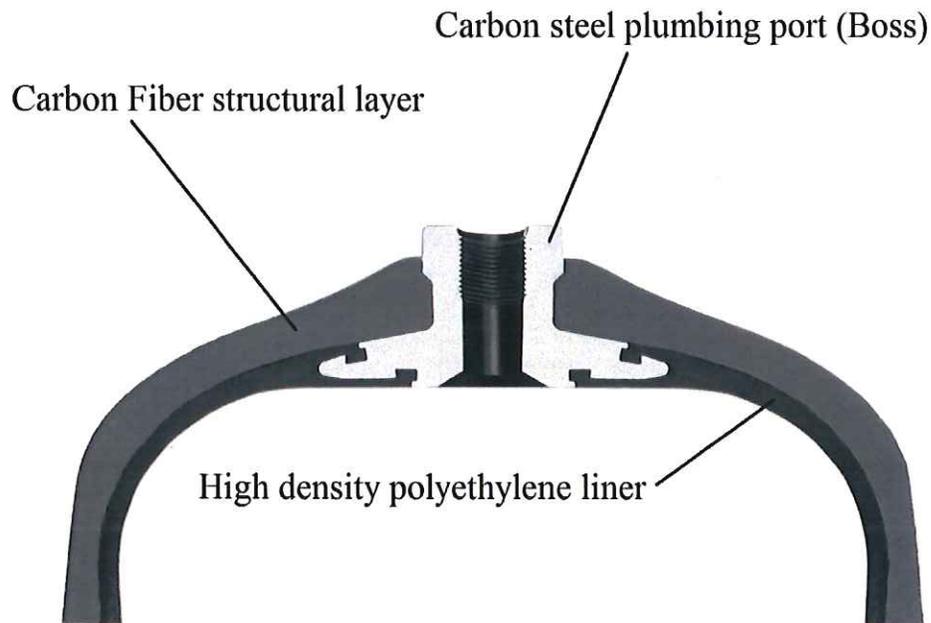


Figure 3: Cylinder Construction

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## 7 General Specifications

Hexagon Composites TITAN® Container (PN: 240167-0001 and 240167-0002) was designed to transport and store non-oxidizing compressed gasses.

The values in Table 2 are nominal and are not to be used for determining if the cylinders are filled.

**Table 2: Typical Working Conditions and Properties**

PN	Total Volume	Cylinder Water Volume	Service Pressure	Cylinder Empty Weight	Cylinder + Gas <sup>1</sup>	Tare Module Weight	Gross Module Weight <sup>1,2</sup>
240167-0001 240167-0002	34048 liters (2077736 in <sup>3</sup> )	8512 liters (519434 in <sup>3</sup> )	250 barg (3626 psig) at 15°C (59°F)	2312 kg (5097 lbs)	4168 kg (9188 lbs)	15631 kg (34460 lbs)	23,053 kg (50823 lbs)

<sup>1</sup>Assuming 0.72 SG and at settled temperature and pressure.

<sup>2</sup>Module must be equipped with aluminum roof sections.

### 7.1 Dimensions

Frame dimensions are per ISO 668:1995; 40 ft. x 8 ft. x 8 ft; flat bottom. Requires a Flat Chassis as shown in Figure 4. The chassis is flat from front to back. The container does not have a tunnel in it for a chassis that has a kick up for the king pin.



**Figure 4 - ISO Container Flat Chassis**

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## 7.2 Pressure Range

This system is designed to a service pressure of 250 bar (3626 psig) settled at 15°C (59°F). The maximum fill pressure is 303 bar (4400 psig); with a maximum fill gas temperature of 82.2°C (180°F). Thus when filling the TITAN® it is filled to a density because pressure is dependent on gas temperature, and typically the gas temperature is in excess of the settled temperature of 15°C (59°F). The fill chart shown in Figure 9 specifies what pressure the vessels may be filled to given the internal gas temperature.

**Danger: Filling the tanks with very hot gas near the operating limit of 82 °C (180 °F) may result in triggering the fire protection system.**

**Always fill cylinders to the working pressures or as directed by the authority having jurisdiction. Cylinders are not designed for vacuum service.**

## 7.3 Temperature Range

The system is designed to operate within a temperature range of -40°C to 82.2°C (-40°F to 180°F). The gas temperature range for a complete temperature compensated fill is -40°C to 65°C (-40°F to 149°F). The owner is responsible for following fill chart requirements in Figure 9 for temperature range to be valid.

## 7.4 Service Life

240167-0001 modules are DOT approved and have a service life of 15 years. 240167-0002 modules are ABS approved and have a service life of 20 years. The maintenance and inspection requirements stated within this manual are to be met.

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## 7.5 Approved Gases

The cylinders are designed for storage and transport of approved gases meeting the specifications for dry or wet gas as follows, and in accordance with the working conditions specified in Section 7. Gas that has been treated by deliberately adding methanol and/or glycol to suppress hydrate formation shall not be used.

**Note high levels of CO<sub>2</sub> will result in dry ice formation during defueling.**

### For Natural Gas:

#### Dry Gas

Water vapor shall be limited to less than 32 mg/m<sup>3</sup>, a pressure dew point of -9°C (15.8°F) at 207 barg (3002 psig).

Constituent maximum limits shall be:

Hydrogen Sulfide	23 mg/m <sup>3</sup>
Oxygen	1.0 % by volume

#### Wet Gas

Natural Gas that contains water content higher than that of dry gas.

Constituent maximum limits shall be:

Hydrogen Sulfide	23 mg/m <sup>3</sup>
Oxygen	1.0 % by volume
Carbon Dioxide	4.0% by volume
Hydrogen	0.1 % by volume

Gas permeation shall be considered if a vessel operates or is stored in an enclosed space for an extended period of time. The allowable rate of natural gas permeation is 0.25 standard cubic centimeters per hour (scch) per liter of water capacity at working pressure (0.201 scm per day or 7.1 SCF per day for the module).

**DANGER! NATURAL GAS IS EXTREMELY FLAMMABLE.**

Natural gas is an extremely flammable gas and has the potential to cause a flash fire or explosion. It is also an asphyxiate. In high concentrations, it will displace oxygen from the breathing atmosphere, particularly in confined spaces. Signs of asphyxiation may include rapid breathing and pulse rate, headache, dizziness, visual disturbances, mental confusion, incoordination, mood changes, muscular weakness, tremors, cyanosis, narcosis and numbness of the extremities. For more information see a Material Safety Data Sheet on natural gas.

**Never smoke near or around this container. Any ignition source has the capability of causing an explosion if a leak is present. Extreme caution must be used at all times during the life of this container.**

## 7.6 Filling/Unloading Station Requirements

The filling/unloading station shall address the following requirements for safe filling and unloading of natural gas: Fire protection, electrical classification requirements, grounding/bonding requirements, safe shutdown device, overpressure protection, vent system, gas temperature control, backflow prevention, and CNG odorants.

**All filling/unloading stations shall adhere to all requirements of the authority having jurisdiction.**

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## 8 Receiving the TITAN® Container

### 8.1 Container Shipping Pressure

The cylinders will be filled with compressed air or nitrogen at a pressure no greater than 1.7 barg (25 psig) before leaving the factory. Refer to section 9.1.1 for filling requirements before first time fill.

### 8.2 Container Inspection

Thoroughly inspect the exterior and interior of the module for obvious signs of damage. Report any unusual findings to Hexagon Composites.

## 9 Operating Procedure

The operator is solely responsible for ensuring that the container is handled in a safe and responsible manner. The operator shall check all local, state, and city fire codes before attempting the work described below.

**The container is not to be transported (except if cylinders are empty) or filled if there is any damage found on the container or cylinders.**

**Never attempt to connect or disconnect a line that is pressurized.**

**It is the Owner and User's responsibility to ensure the TITAN® systems are being filled with "clean gas". The term "clean gas" used in this manual refers to the gas particulate size range of 3 to 10 microns. Hexagon Composites is not responsible for any failures of any components of the module if this "clean gas" specification is not met.**

**Any valve used on the TITAN® should not be throttled in any way. The throttling of a valve in this manual is defined as change of position of valve stem during gas flow. This can result in erosion of the valve seats and seals. It is the Owner and User's responsibility to ensure throttling of valves is not occurring with their modules. Hexagon Composites is not responsible for any failures of any valves on the TITAN® module if a valve shows signs of throttling.**

### 9.1 Filling Procedure

For filling multiple or single cylinders, follow the below instructions:

**Filling or unloading a single cylinder must be done carefully. Opening the valves between differently pressured cylinders may cause the liner to fail if liquid natural gas is formed.**

1. Obtain and complete a "Filling Checklist" (see Appendix A) while following steps 2 through 13. Keep checklist for records.
2. Position container for filling procedure ensuring that the container remains stationary (e.g. chock vehicle tires, set vehicle brake, engine off, etc.) and that the vent lines are not obstructed (e.g. sheds, coverings, etc.).

**This system does not have a break-away connection. Owner is responsible for break-away connection on hose.**

**During a venting of the cargo, the natural gas must not be allowed to accumulate. The container must not be filled under a structure of any kind where gas is allowed to accumulate. Containers must be filled in an open air environment.**

3. Open doors at rear of container to view thermometer in lower left tank.
4. Connect grounding source to grounding lug as shown in Figure 5 to prevent potential static ignition.

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Figure 5: Grounding Lug

5. Verify that manifold valves are in their "closed" position as shown in Figure 6.
6. Open the bleed valve shown in Figure 6.

Manifold valves should always be in "closed" position except during filling or un-loading.

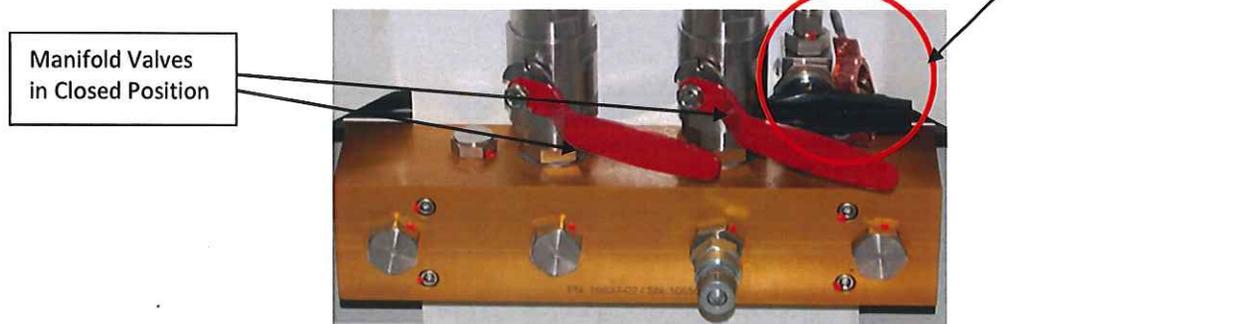
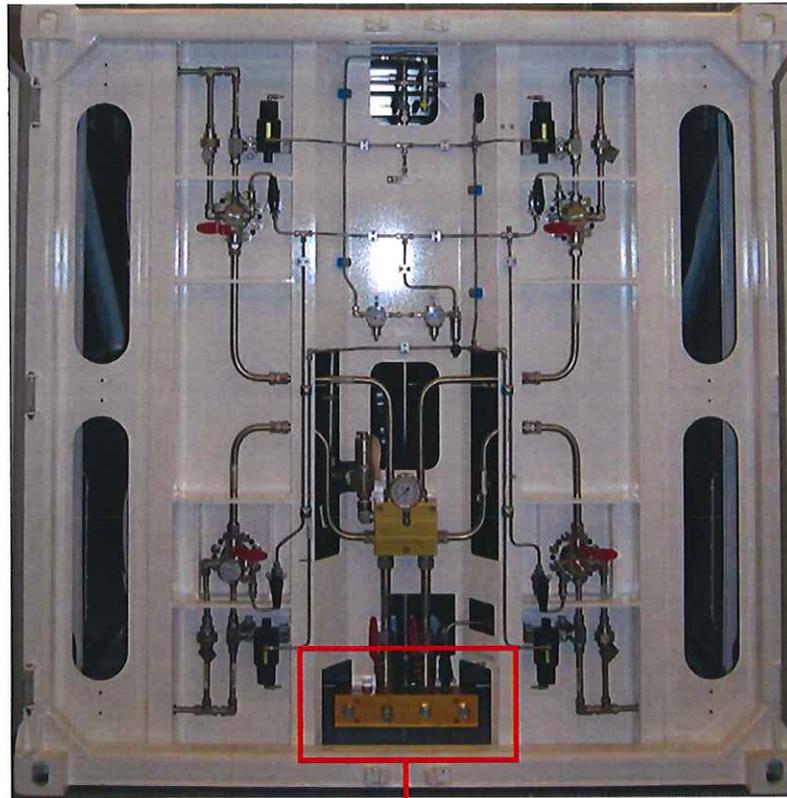


Figure 6: Manifold Valves Shown in "Closed" Position

7. Connect the station's fill line to the container's fill line. Refer to Figure 7.

**Note:** The container may not be shipped with a quick connector. The owner must supply a quick connector that is compatible with the system and shall connect it in accordance with their procedure. The manifold is equipped with four 1 5/16-12 SAE ports to adapt to quick connectors.



Container quick  
connect ports  
(Connector lines not  
shown)  
1 5/16-12 SAE

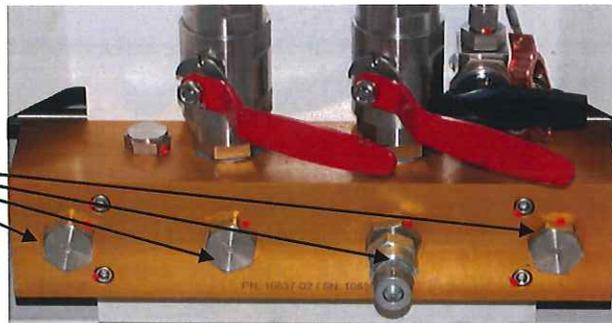


Figure 7: Container Fill Line

8. Close bleed valve.
9. Once the connection is secure, open the manifold valves shown in Figure 8.

**Do not open the valve of a cylinder that has a pressure of less than 10.3 barg (150 psig) while another cylinder (high pressure) valve is open and when temperatures are below -12°C (10°F). This can cause liquid natural gas to form which can damage the liner of the cylinder.**

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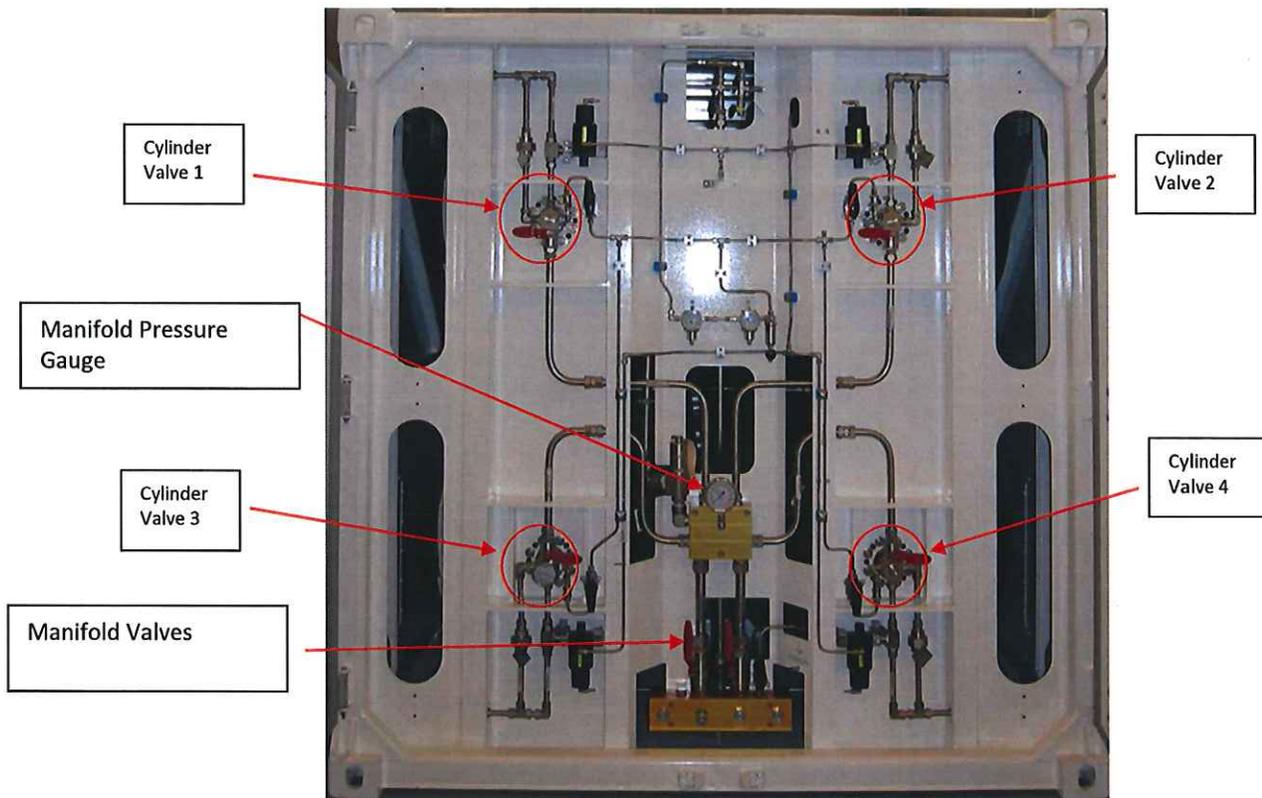


Figure 8: Cylinder Valves in "Open" Position

10. Open the cylinder valves (shown in Figure 8). The pressure in the distribution manifold can be read by the pressure gauge as shown in Figure 8.
11. Begin filling the cylinder(s) in accordance with the station's operation and safety procedures.

**Filling composite cylinders of this size will generate noises that are normal. During filling, the liner will push out trapped gas between the liner and composite. This may appear as bubbles coming through the composite, but will stop after all trapped gas is evacuated. The process of removing the gas may take several hours to days depending on the amount of trapped gas. As the tank slides in the bearing it will make noise as well.**

**If there is any leak in the plumbing during filling, immediately close all tank valves and discontinue the filling procedure. Vent the system plumbing and repair the leak. If leak cannot be repaired contact Hexagon Composites technical service.**

12. Continue filling the cylinder(s) until the pressure indicated by the manifold pressure gauge reaches the desired pressure. Do not exceed the maximum fill pressure/temperature combinations as shown in Figure 9. Figure 9 may also be used when performing temperature compensated fills. For example, when filling to 276 barg (4000 psig) and approximately 60 °C (140 °F) as shown by the red circle in Figure 9 this will result in a 90% fill.

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# Danger

Do not exceed a tank temperature of 82.2 °C (180 °F).

**Danger: Filling the tanks with very hot gas near the operating limit of 82 °C (180 °F) may result in triggering the fire protection system.**

Do not fill cylinders over the maximum pressure specified in Section 7.2. Failure to comply may lead to personal injury/death/property damage.

The pressure gauge is not designed for vacuum pressure and will not properly indicate vacuum conditions.

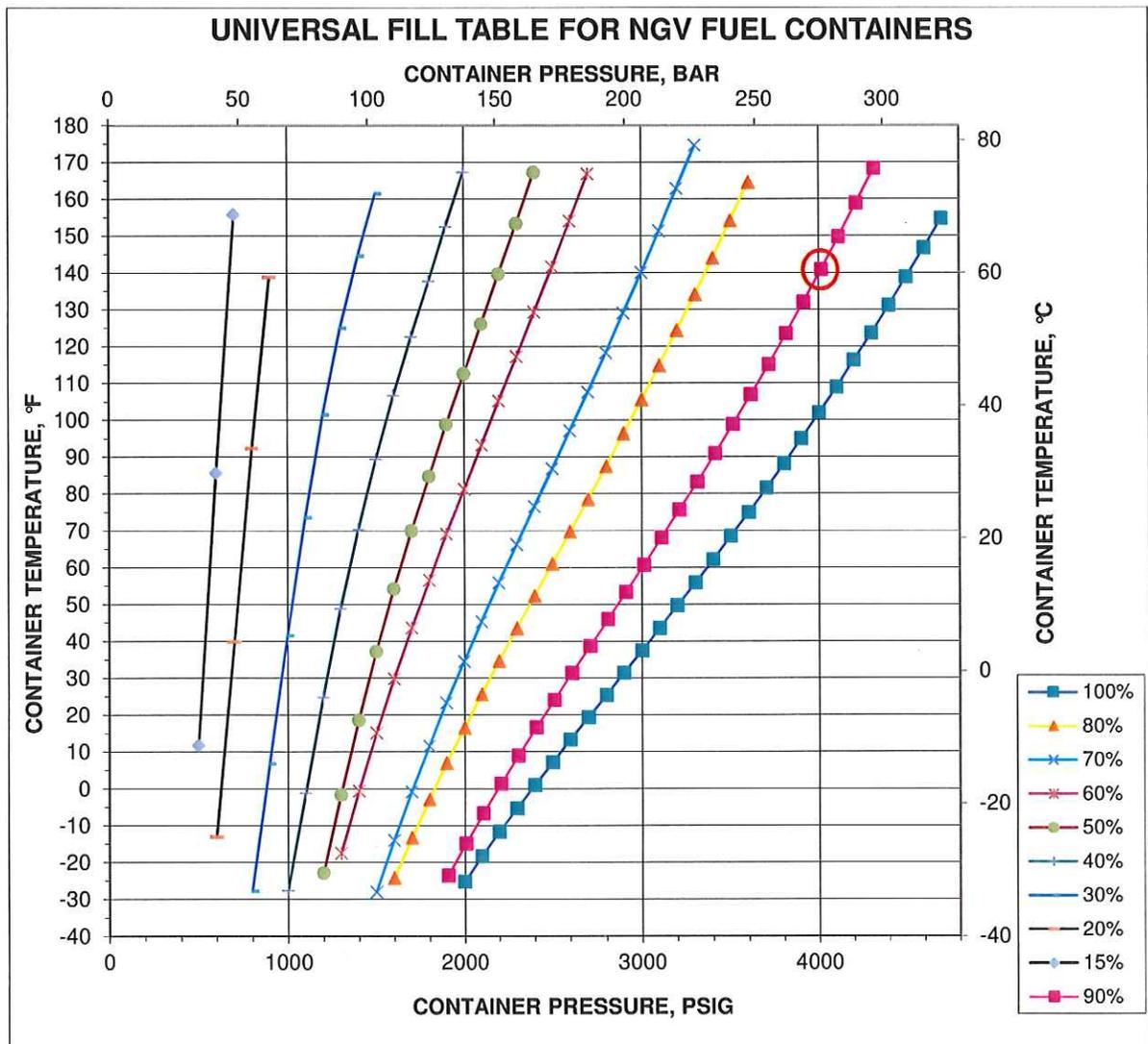


Figure 9: Percent Fill as a Function of Temperature and Pressure (SG = 0.58)

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13. Once the appropriate pressure is obtained, then follow the station procedures for shutting off flow.

If required by authority having jurisdiction, close the tanks valves and manifold valves otherwise just close manifold. Next, vent the manifold by opening the bleed valve as shown in Figure 10. Finally, disconnect the station's fill line.

14. Close the bleed valve.

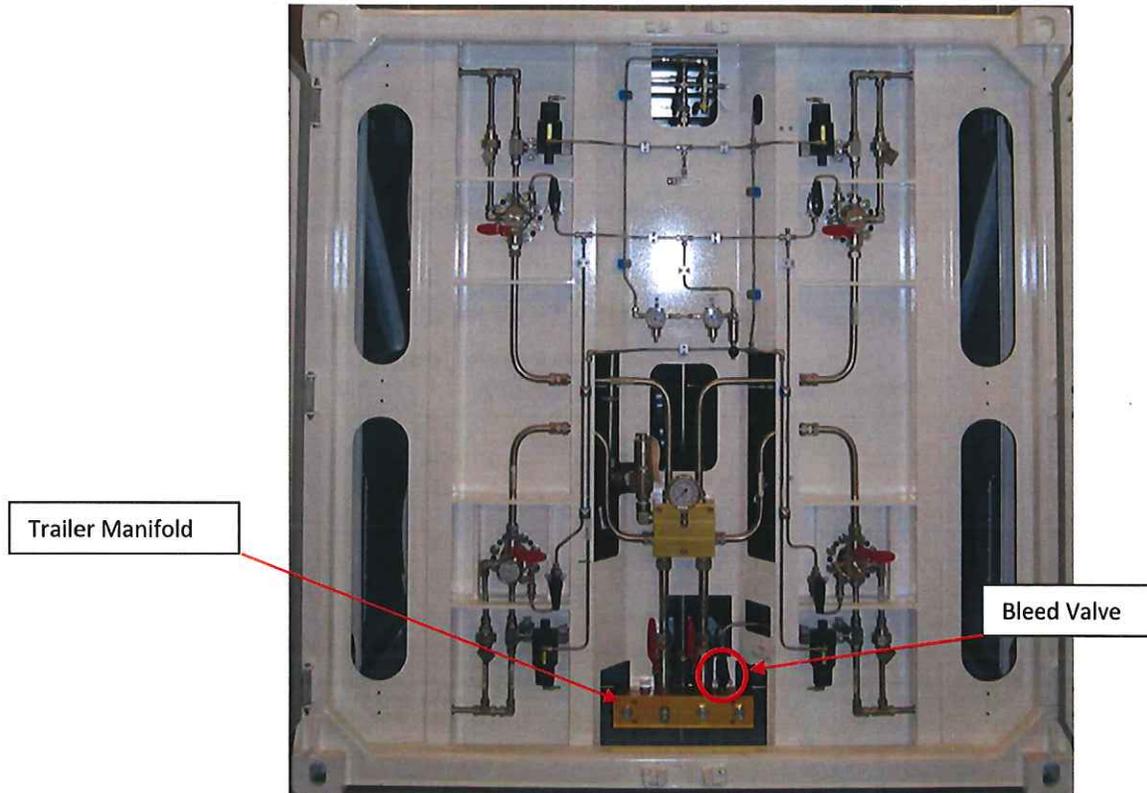


Figure 10: Bleed Valve in "Open" Position

#### 9.1.1 Fill & Unloading Restrictions

A cylinder may only be filled when:

- a. The ambient temperature is greater than  $-12^{\circ}\text{C}$  ( $10^{\circ}\text{F}$ ), or
- b. The cylinder is in service with a residual internal pressure greater than or equal to 10.3 barg (150 psig), or
- c. The cylinder has been conditioned at a temperature above  $16^{\circ}\text{C}$  ( $60^{\circ}\text{F}$ ) for at least 8 hours after exposure to ambient temperatures below  $-12^{\circ}\text{C}$  ( $10^{\circ}\text{F}$ ) with less than 10.3 barg (150 psig) internal pressure.

The gas density of the cylinders must not exceed the allowable density at 250 barg (3626 psig) and  $15^{\circ}\text{C}$  ( $59^{\circ}\text{F}$ ). Thus if the ambient temperature is  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ) the tanks may not be filled above 133 barg (1928 psig).

Cylinders starting at less than 10.3 barg (150 psig) internal pressure and an ambient temperature of  $-12^{\circ}\text{C}$  ( $10^{\circ}\text{F}$ ) or less and have not been conditioned as described above should use the cold fill procedure described below. This condition could occur when first received, after maintenance work is performed, or if the cylinders have been emptied below 10.3 barg (150 psig).

#### Work Required For Cold Fill Procedure

1. Fill to  $31 \pm 3$  barg ( $450 \pm 50$  psig) directly from a compressor (not from a cascade system or line pressure).
2. Wait at least 1 hour.
3. Proceed with filling.

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#### 9.1.1.2 Minimum Pressure While Operating Solely Based on Minimum Pressure

- Maintain a minimum heel pressure of 28 barg (400 psig) at all times during operation. The 28 barg (400 psig) minimum pressure is not dependent on ambient temperature and should be maintained regardless of the ambient temperature range in which the product is operated.
- Adhere to the procedure laid out in Section 9.1.1 when re-pressurizing after the tank has been depressurized below 28 barg (400 psig) due to service or other reasons.

#### 9.1.1.3 Operational Control Based on Minimum Operating Pressure and Minimum Temperature

Reduced temperature and pressure limits are allowed if adequate control systems are in place and capable of correctly and continuously monitoring, recording, and controlling the decanting of the module as defined below. It is recommended to have temperature and pressure control system to monitor decanting operations to enable safe operation of TITAN<sup>®</sup> systems below 28 barg (400 psig). This system must produce records and be available for inspection by Hexagon Composites to evaluate the performance of the system and for adjudication of warranty claims.

- Gas temperature in the tank may not be reduced lower than -73 °C (-100 °F) during the decanting operation or
- Static tank internal pressure may not be reduced lower than 10.3 barg, (150 psig) during the decanting operation
- Whichever condition occurs first.

If gas temperature and tank pressure measurements are taken at the Pressure Reduction Station (PRS), these should be correlated to TITAN<sup>®</sup> system internal conditions. Hexagon offers support to conduct this as a field study.

#### 9.1.1.4 Minimum Pressure During Maintenance and Storage of Equipment

- Maintain a minimum heel pressure of 28 barg (400 psig) when equipment is not in continuous operation or is expected to be out of use for more than 12 hours. The 28 barg (400 psig) minimum pressure is not dependent on ambient temperature and should be maintained regardless of the ambient temperature
- Limit the time the tanks are without pressure [0 barg (0 psig)] to a maximum of 4 hours during maintenance of items such as tank valves.
- Adhere to the procedure laid out in Section 9.1.1 when re-pressurizing after the tank has been depressurized below 28 barg (400 psig) due to service or other reasons.

**Do not allow a vacuum to form in the cylinders at any time. Should a vacuum occur in the cylinder, the cylinder should be opened to atmosphere and conditioned at a temperature of approximately 16°C (60°F) for 8 hours.**

#### 9.1.2 Fill Chart

The fill chart shown in Figure 9 gives the maximum pressure that each cylinder is to be filled at for certain natural gas temperatures.

If the internal gas temperature is between temperatures on the chart, always take the lower value.

Many compressor stations are not capable of achieving a full fill because of the high gas temperatures and limited upper pressure of 250 barg (3600 psig). In many cases a compressed gas cooling system must be installed to achieve a full fill. This may result in a multi-stage filling process to achieve the full fill of the module. Refer to Figure 9 to determine the level of fill that will be achieved.

**The gas temperature must not exceed 65 °C (149°F) at any time unless operational procedures of the fill station are discussed with Hexagon Composites engineering.**

### 9.1.3 In Case of Emergency

In case of emergency at fill station, follow the station's emergency procedure for flammable gases in accordance with the authority having jurisdiction.

## 9.2 Unloading Procedure

The cylinders are not designed for vacuum service. Once the cylinders have been filled, they should never be emptied below 10.3 barg (150 psig) of pressure. The reason for this residual pressure is to ensure the stability of the liner. If the cylinders are emptied below a pressure of 10.3 barg (150 psig) and the temperature is less than -12°C (10°F) then follow the Cold Fill procedure in section 9.1.1.

For unloading the contents of the containers, follow the instructions below:

1. Obtain and complete a copy of the "Unloading Checklist" (see Appendix C) while following steps 2 through 14. Keep for records.
2. Position container for unloading procedure ensuring that the container remains stationary (e.g. chock vehicle tires, set vehicle brake, engine off, etc.) and that the vent lines are not obstructed by any infrastructure (e.g. sheds, coverings, etc.).

**This system is not supplied with a break-away connection. Owner is responsible for break-away connection on hose.**

3. During venting of the cargo, the natural gas must not be allowed to accumulate. The container must not be under a structure of any kind.
4. Open doors.
5. Connect grounding source to grounding lug shown in Figure 5 to prevent static ignition.
6. Open the bleed valve as shown in Figure 10.

**The manifold valves should always be in "closed" position except during filling or unloading.**

7. Connect the unloading line to the container's quick connector. Note: This container is shipped without a connector. The owner must supply a connector and should connect it in accordance with their procedure.

Note: The port used for unloading may be the same as the containers fill port as shown in Figure 7.

8. Close bleed valve.
9. Open manifold valves. Valve position is shown in Figure 11.
10. Open the cylinder valves as highlighted in Figure 8

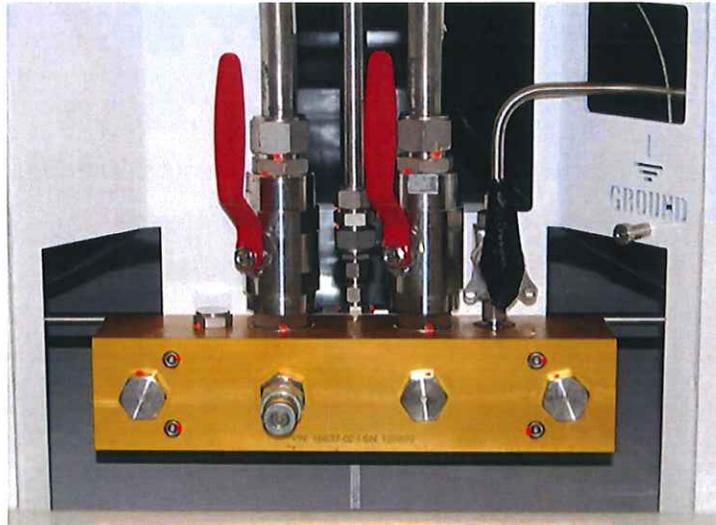


Figure 11 - Manifold Valves in Open Position

**Do not open the valve of a cylinder that has a pressure of less than 10.3 barg (150 psig) with another cylinder whose valve is open when temperatures are below -12°C (10°F). This can cause liquid natural gas to form which can damage the liner of the cylinder. If the pressure gage reads 0 psi when a tank valve is opened it should be assumed the pressure in the tank is 0. A tank with 0 pressure should be filled with a compressor.**

11. Unload cylinders.

If a pump is used to unload cylinder(s), ensure that the pressure in the cylinder(s) does not fall below 10.3 barg (150 psig). This will prevent the tank(s) from experiencing any vacuum, which would destabilize the liner. If the pressure does fall below 10.3 barg (150 psig) and the temperature is below -12°C (+10°F), then follow the Cold Fill Procedure in Section 9.1.1.

Allow the cylinders to depressurize to a pressure of 10.3 barg (150 psig) or above. If the pressure falls below 10.3 barg (150 psig) and the temperature is below -12°C (+10°F), then follow the Cold Fill procedure in Section 9.1.1.

**If the cylinders are unloaded to a pressure below 10.3 barg (150 psig) and the temperature is below -12°C (+10°F), then follow the Cold Fill procedure in Section 9.1.1.**

12. Close the cylinder(s) valve(s).
13. Once the cylinder valves have been closed, shut off the discharge system. Relieve pressure in the unloading manifold by opening and then closing the bleed valve.
14. Follow the stations procedures for disconnecting the discharge line.

**The pressure gauge is not designed for vacuum pressure and will not properly indicate vacuum conditions.**

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15. Close the manifold valves.

**The plumbing between the cylinder valves and the manifold valves are always to be depressurized unless the authority having jurisdiction allows manifolds to be pressurized during transportation. Follow steps 11 and 12 above to vent the plumbing.**

16. Ensure that the vent valve is in the closed position.
17. Remove the ground strap.
18. Close doors.

#### **In Case of Emergency**

In case of emergency at pressure reduction station, follow the station's emergency procedure for flammable gases.

### 9.3 Container Transport

#### 9.3.1 Transport Checklist

Before transporting the container a "Transportation Checklist" sheet shall be completed and kept. Do not transport the container without completing a "Transportation Checklist" (See 0).

#### 9.3.2 Approved Routes

The owner/operator is responsible to obtain pre-approved routes of transportation that adhere to local regulatory requirements for the transporting of hazardous materials. This includes meeting the clearance requirement (see next paragraph). The owner/operator is also responsible for ensuring these pre-approved routes are followed. The owner/operator is liable for any damage/injury/death/incident caused by the container because of a failure to meet the proper requirements.

Due to the dimensions of the container, the route of transportation must meet a minimum clearance requirement depending on the configuration of the container and vehicle. The container height is 8.0 ft (2.44 meters) as specified by ISO 668. The total height of the setup is to be determined by the owner/operator. It is the responsibility of the owner/operator to find out from the authority having jurisdiction what minimum clearance is acceptable.

**Pay special attention to requirements regarding the transport of hazardous materials in tunnels and the parking of hazardous materials in populated areas.**

#### 9.3.3 Inspection

A visual inspection for damage is to be made before and after each trip. This inspection is on all surfaces of the ISO container including the top and bottom. If any damage is found, refer to Section 13.

**The container is not to be transported (except if cylinders are empty) if there is any damage found during this inspection.**

**All valves must be closed before transporting the container unless the authority having jurisdiction allows manifolds to be pressurized during transportation.**

#### 9.3.4 In Case of Emergency

Call the Emergency Response Telephone Number on the Shipping Paper first. If the Shipping Paper is not available or there is no answer, refer to the appropriate telephone number listed in Section 15 or by the authority having jurisdiction.

### 10 Emergency Shut Off System (If Equipped)

The purpose of this system is to remotely shut off the flow of gas at the rear of the module in case of fire at the rear of the module, or in case of a line break or disconnection at the rear of the module. This system is designed to be used in case of an emergency only. The shut off system is shown in Figure 12 below.

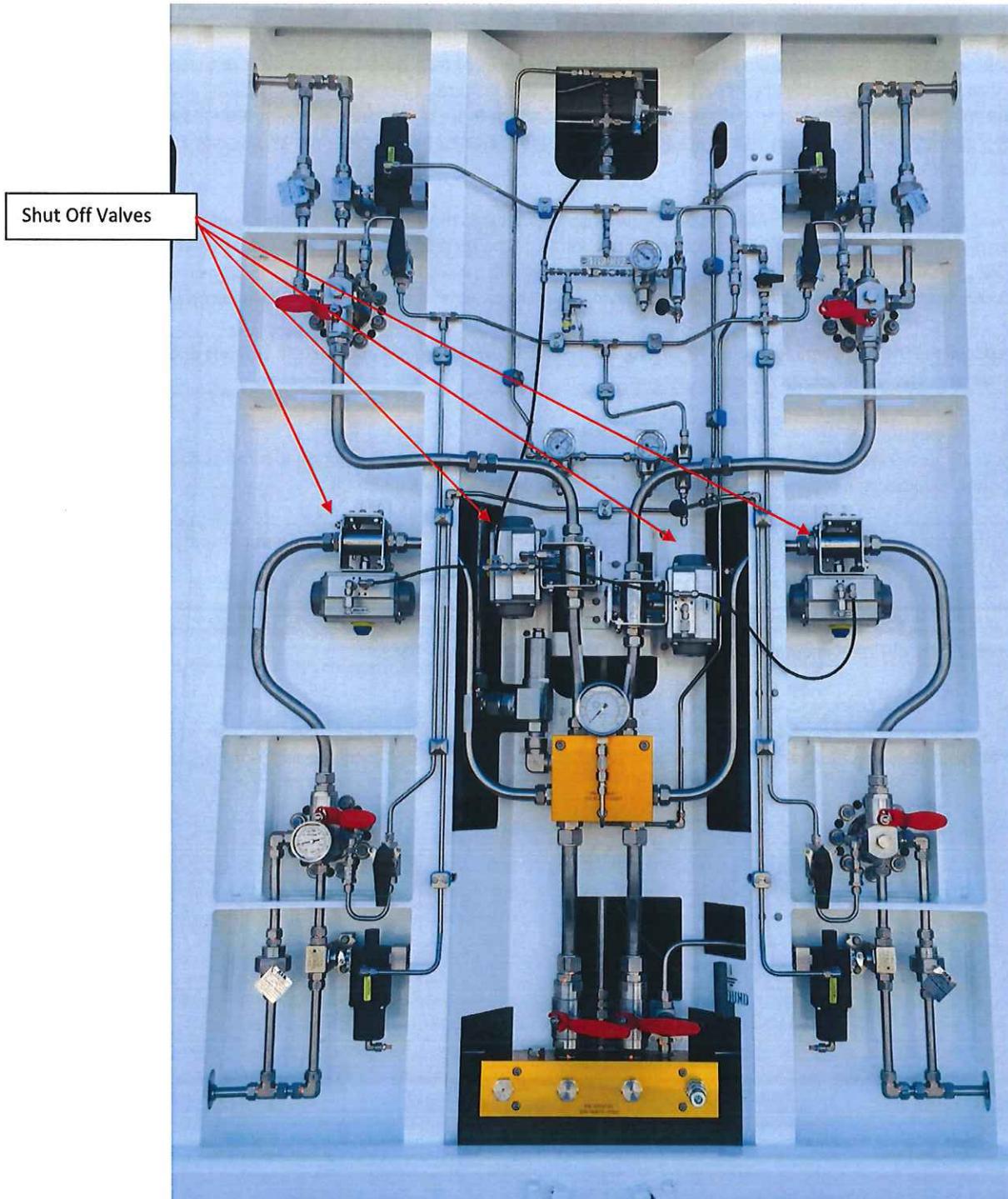


Figure 12 - Emergency Shut Off System Installed on Normally Closed Module

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If there is an emergency where the Shut-Off System should be used, the shut off valve on either side of the module can be moved to the "Flow Off" position to remotely stop the flow of gas at the rear of the trailer. It will take a few seconds for the valves to actuate closed.

The shut off valves are located on both sides towards the front of the module shown in Figure 13.

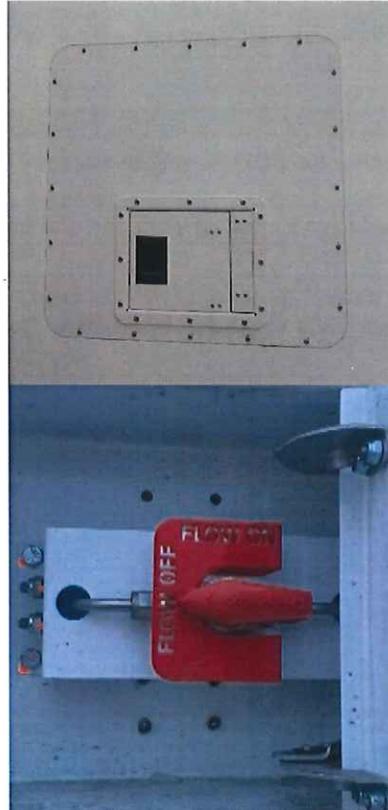


Figure 13: Valve Shown in "Flow Off" Position

When the emergency has been corrected, the valves may be re-opened by closing the valve(s) at the front of the trailer as shown in Figure 14. This will open the pneumatic valves at the rear of the trailer and allow flow in and out of the tanks.

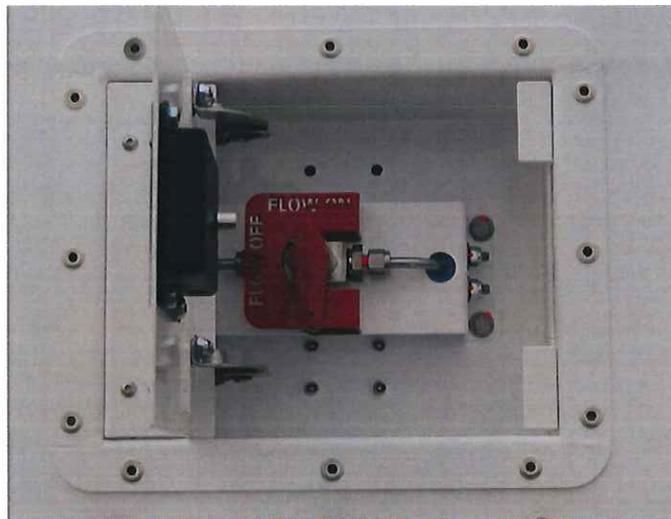


Figure 14 - Valve shown in "Flow On" Position

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### 10.1 Filling Procedure (If equipped with Emergency Shut Off System)

For filling multiple or single cylinders, follow the below instructions:

**Filling or unloading a single cylinder must be done carefully. Opening the valves between differently pressured cylinders may cause the liner to fail if liquid natural gas is formed.**

1. Obtain and complete a "Filling Checklist" (see Appendix A) while following steps 1 through 24. Keep checklist for records.
2. Position container for filling procedure ensuring that the container remains stationary (e.g. chock vehicle tires, set vehicle brake, engine off, etc.) and that the vent lines are not obstructed (e.g. sheds, coverings, etc.).

**This system may have a break interlock system to protect unit and station against damage (shown in Figure 8)**

**During a venting of the cargo, the natural gas must not be allowed to accumulate. The container must not be filled under a structure of any kind where gas is allowed to accumulate. Containers must be filled in an open air environment.**

3. Open doors at rear of container to view thermometer in lower left tank.
4. Connect grounding source to grounding lug shown in Figure 15 to prevent potential static ignition.

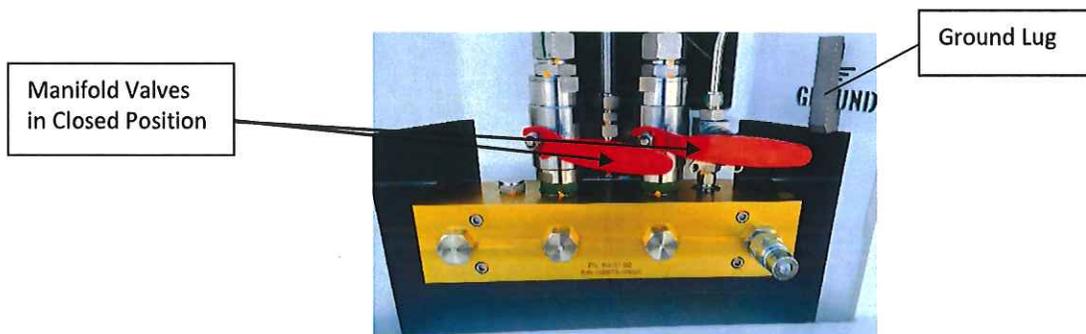


Figure 15: Grounding Lug

5. Verify that manifold valves are in their "closed" position as shown in Figure 15.
6. Open the bleed valve as shown in Figure 16. This is to ensure there is no pressure in the manifold before connecting fill lines

**Manifold valves should always be in "closed" position except during filling or un-loading.**

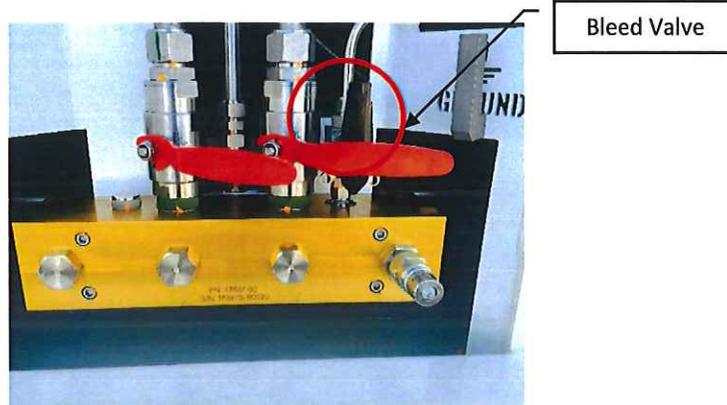


Figure 16: Bleed Valves shown "Open"

The user is responsible for verifying that copies are the current revision before use.

7. Connect the station's fill line to the container's quick connect(s) Refer to Figure 17.

**Note: The container may not be shipped with a quick connector. The owner must supply a quick connector that is compatible with the system and shall connect it in accordance with their procedure. The manifold is equipped with four 1 5/16-12 SAE ports to adapt to quick connectors.**

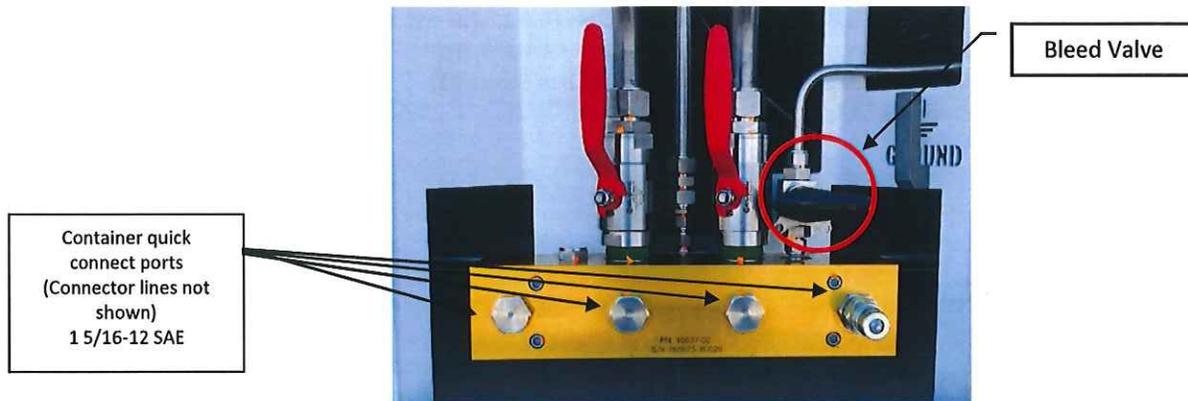


Figure 17: Connector ports and quick connect

8. Close bleed valve shown in Figure 17.
9. Be sure all Shut-Off Valves on the front of the module are in the "closed" (Flow On) position shown in Figure 19.
10. Open Manifold Valves completely instead of "throttling" the valves shown in Figure 17.

**Do not open the valve of a cylinder that has a pressure of less than 10.3 barg (150 psig) while another cylinder (high pressure) valve is open and when temperatures are below -12°C (10°F). This can cause liquid natural gas to form which can damage the liner of the cylinder.**

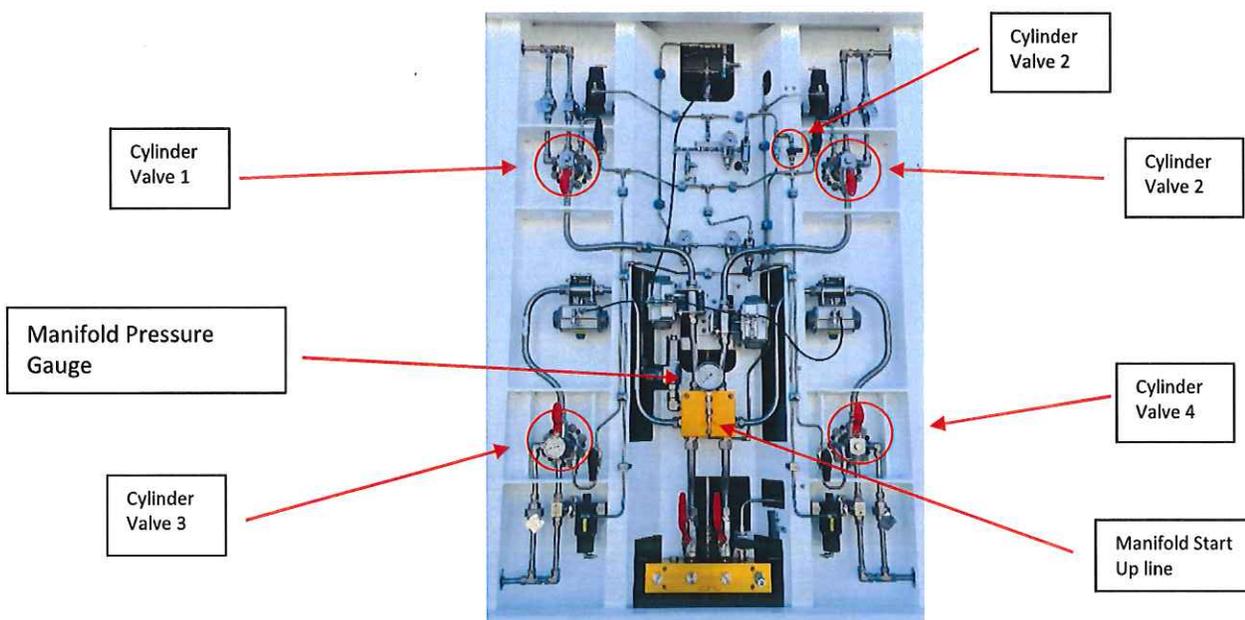


Figure 18: Cylinder Valves in "Open" Position

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11. Begin charging the manifold in accordance with the station's operation and safety procedures, this will feed the Shut-Off system start up pressure and actuate the valves.
12. Open the cylinder valves shown in Figure 18. This will begin filling the cylinder(s).
13. Open constant feed ¼ turn valve while filling cylinder(s). This will need to be left open at all times.
14. Continue filling the cylinder(s) until the pressure indicated by the manifold pressure gauge reaches the desired pressure. Do not exceed the maximum fill pressure/temperature combinations as shown in Figure 9. Figure 9 may also be used when performing temperature compensated fills. For example, when filling to 276 barg (4000 psig) and approximately 60 °C (140 °F) this will result in a 90% fill. See Figure 20.
15. Once the appropriate pressure is obtained, then follow the station procedures for shutting off flow.
16. Close tank valves.
17. Vent the manifold by opening the bleed valve as shown in Figure 21.
18. Disconnect the station's fill line.
19. Close Manifold Valves.
20. Close the bleed valve.
21. Disconnect ground

**Filling composite cylinders of this size will generate noises that are normal. During filling, the liner will push out trapped gas between the liner and composite. This may appear as bubbles coming through the composite, but will stop after all trapped gas is evacuated. The process of removing the gas may take several hours to days depending on the amount of trapped gas. As the tank slides in the bearing it will make noise as well.**

**If there is any leak in the plumbing during filling, immediately close all tank valves and discontinue the filling procedure. Vent the system plumbing and repair the leak. If leak cannot be repaired contact Hexagon Composites technical service.**

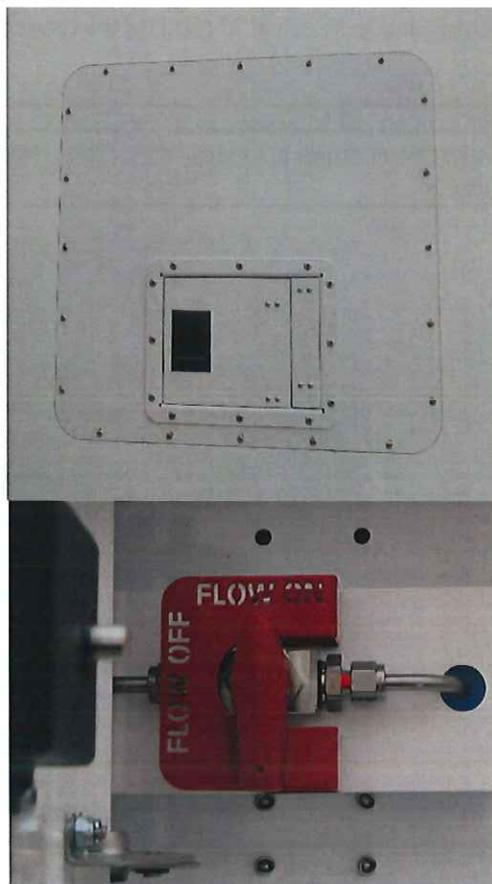


Figure 19: Shut-Off Valve "Closed" (Flow On) Position

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## Danger

Do not exceed a tank temperature of 82.2 °C (180 °F).

**Danger: Filling the tanks with very hot gas near the operating limit of 82 °C (180 °F) may result in triggering the fire protection system.**

Do not fill cylinders over the maximum pressure specified in Section 7.2. Failure to comply may lead to personal injury/death/property damage.

The pressure gauge is not designed for vacuum pressure and will not properly indicate vacuum conditions.

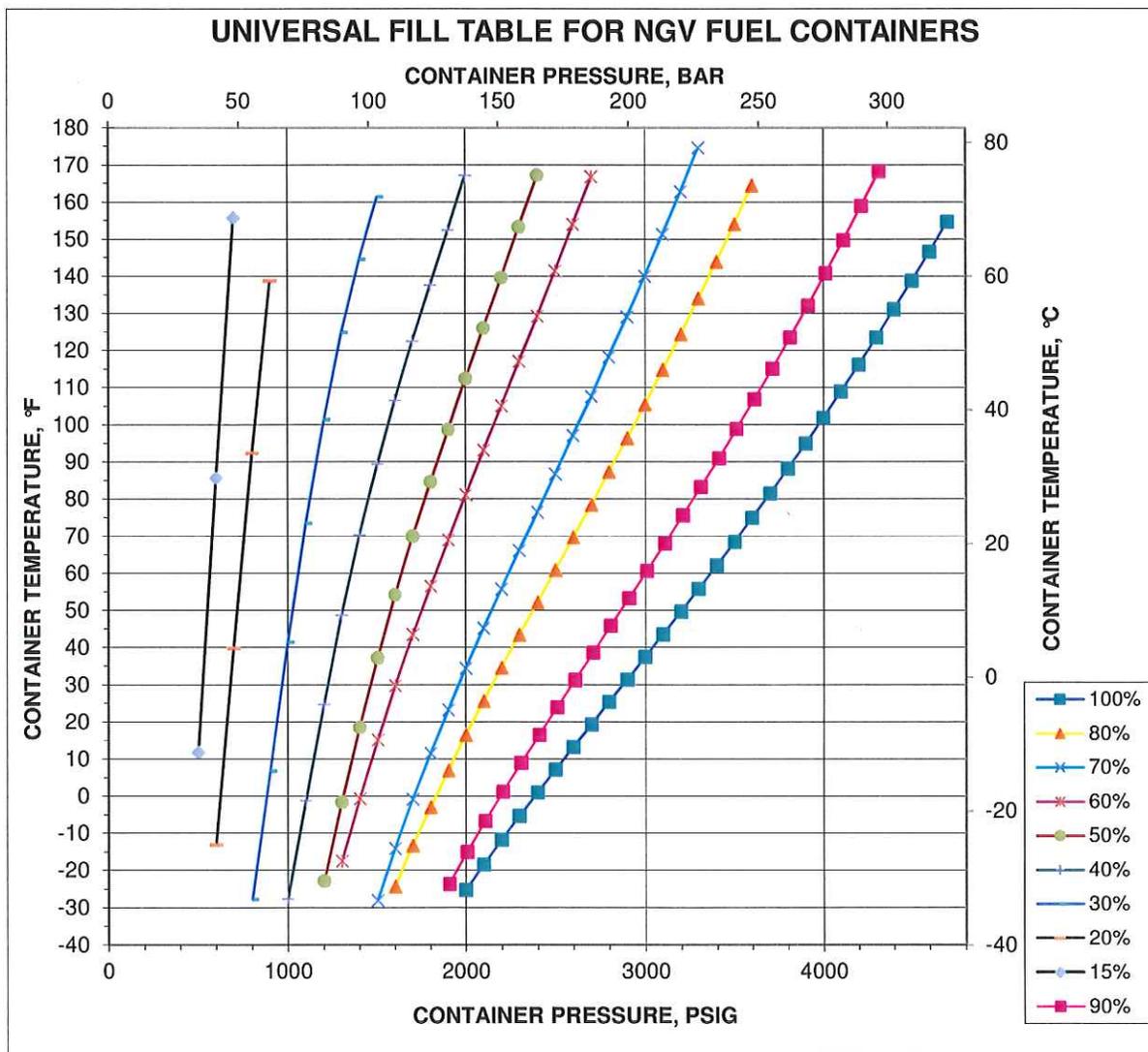


Figure 20: Percent Fill as a Function of Temperature and Pressure (SG = 0.58)

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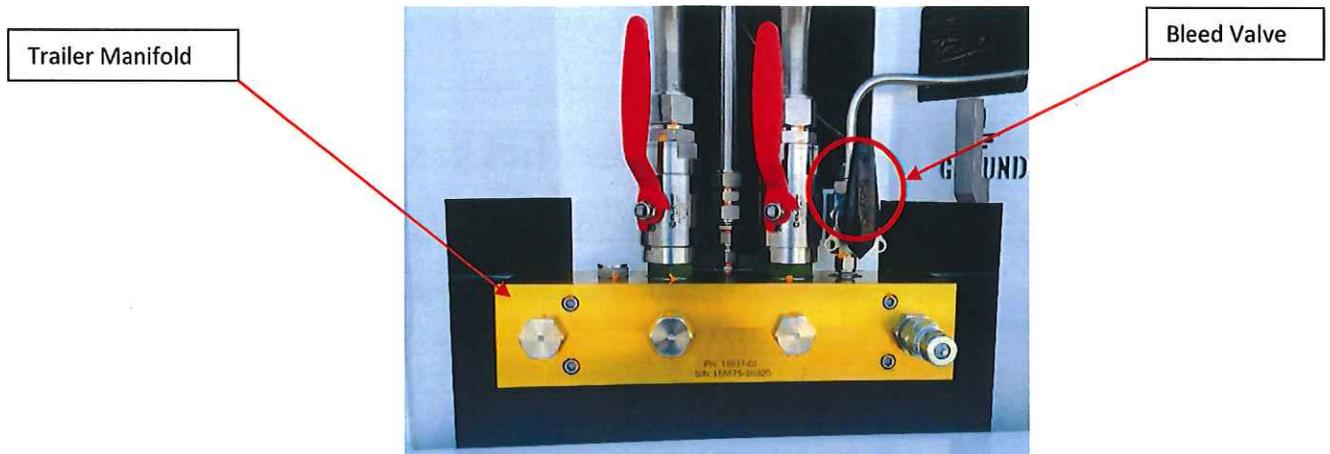


Figure 21: Bleed Valve in "Open" Position

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## 11 Gas Venting System

A pressure relief device (PRD) is used to vent the contents of the vessels in case of fire. This particular PRD system is **thermally activated** and consists of 4 temperature-sensitive trigger lines that run the length of the container. The 240167-0001 and 240167-0002 configurations use an Emcara shape memory wire that is activated at 108 °C (226 °F).

The system is constantly feed with CNG and regulated at 12.4 barg (180 psig). The system is designed such that in the event of a fire, the trigger lines will activate and release pressure in the gas venting system, activating the four gas venting valves and vent the entire contents of the module. The contents of all four cylinders will vent once any one of the four lines is triggered. Venting the contents of all the cylinders may take up to 45 minutes.

The system is also designed to constantly provide supply gas and to not inadvertently vent the tank contents unless the module is in a fire. This is a normally closed system meaning the pneumatic actuated valves are normally closed and will not actuate until gas is supplied to them from the Emcara triggers.

**Do not attempt to pressurize the cylinders if they are venting.**

**Danger: Filling the tanks with very hot gas near the operating limit of 82 °C (180 °F) may result in triggering the fire protection system.**

### 11.1 Inspection of Gas Venting System

The Gas Venting System should be inspected at every 36 months, or when maintenance is performed on the gas venting system, or if the container is involved in an accident. The inspection should include a detailed visual examination of all components that encompass the gas venting system as well as a leak test of the pressurized components. Perform the following:

1. Inspect the PRD trigger line for indications of damage. Note that these are only visible at the ends of the container. Inspect the end connections of all four trigger lines as shown in Figure 22.

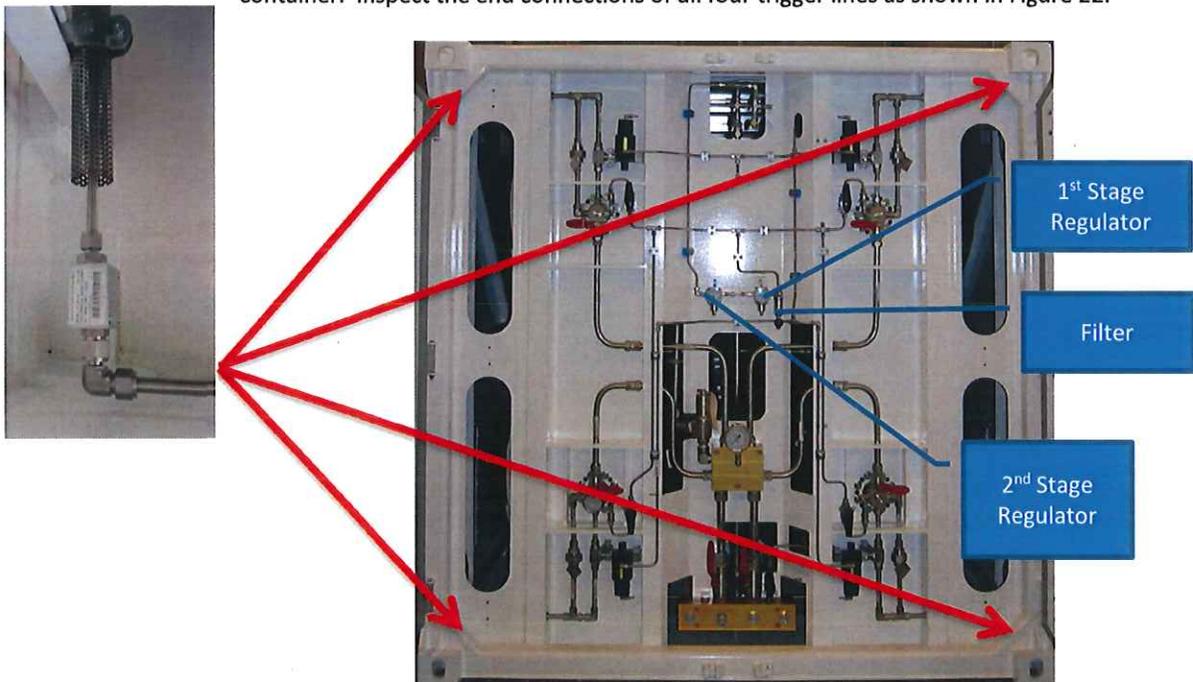


Figure 22: Gas Venting System Inspection

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2. Ensure that the first stage regulator is set between 16.5 to 17.9 barg (240 to 260 psig) with an inlet pressure of 250 barg (3626 psig) minimum
3. Ensure that the second stage regulator is set between 12.8 to 13.4 barg (185 to 195 psig) with the first stage as set in step 1.
4. Use liquid leak detector and check plumbing for leaks.
5. Repair leaks as necessary.
6. Check the vent lines to make sure they are free from debris and the vent caps have o-rings to prevent water into to the vent lines.
7. Check the filter
  - a. Close ¼ turn supply valves connected to tank valves
  - b. Open bleed valve on bottom of filter and drain system
  - c. Remove filter housing
  - d. Inspect filter cartridge. If wet or replacement is necessary contact Hexagon Composites for PN 16977-04. **Suggested replacement interval is 6 months but is dependent on the gas water content and possible methanol addition to gas to prevent hydrate formation in cold winter months.** Maintenance

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## 12 Required Maintenance

DOT and TC approved modules (PN 240167-0001) require hydrostatic proof testing of the TITAN<sup>®</sup> tanks. Modules must be tested by Hexagon Composites for testing prior to 5 and 10 years of service. After 15 years the modules must be replaced. ABS approved modules (PN 240167-0002) require a visual examination at 30 months of the tanks and the outer structure. The inspection procedure is outlined in Hexagon Composites Service Bulletin SB 10-01-002. Module inspection may be documented in Hexagon Composites Service Bulletin SB 14-11-001. Recommended maintenance is documented in Hexagon Composites Service Bulletin SB 15-03-001.

### 12.1 Preventative Maintenance

12.1.1 At 6 month intervals check the tank mount bolt torque as specified in Hexagon Composites Service Bulletin SB 11-04-001.

12.1.2 Replace filter in gas venting system per section 10.

#### 12.1.3 Vent Lines

The vent lines have spring-loaded pressure relief caps to prevent moisture and debris from contaminating the valves. A visual inspection of these caps should be performed during periodic maintenance to ensure they are closed and no debris is present in the line. If the pressure relief system is ever energized while there is pressure in the tanks it will blow off the o-ring under each cap and they must be replaced to prevent leakage. The location of the vent caps is shown in Figure 23 and a more detailed image is shown in Figure 24.

**Note: Pressure in the lines may cause the o-rings on the vent caps to be damaged or lost and they must be replaced because they can no longer form a seal and keep water from entering the vent lines. Contact Hexagon Composites for replacement o-rings.**

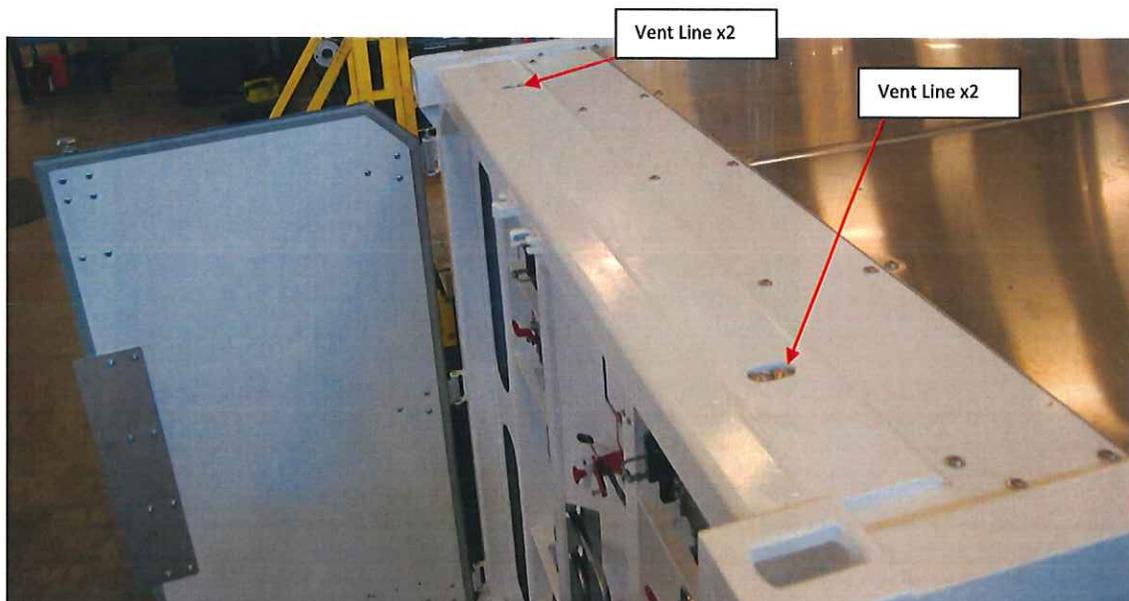


Figure 23: Location of Vent Lines

**Note: Failure to replace the o-rings may result in water in the vent lines which will freeze and damage the lines in cold environments.**

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Figure 24: Vent Line Caps - PN 16826-12

#### 12.1.4 Tank Draining

Over time moisture and compressor oil may accumulate in the tanks. The tanks are equipped with drain tubes that are in contact with the bottom of the tank at the front of the module. The outlet of these tubes have a needle valve as shown in Figure 25.

To drain the water out of the tanks perform the following procedure:

1. Lower the front of the trailer at least 25.4 mm (1") lower than the rear of the trailer to direct the water towards the front.
2. Close the needle valve by turning it clockwise as faced from above the handle.
3. Remove the cap on the needle valve using a 9/16" wrench.
4. Slowly open the needle valve. Note that pressure in the tanks will push water through the needle valve.
5. Allow water to drain. Note that both water and natural gas will drain simultaneously. As the water content decreases only natural gas will vent. When this occurs, close the needle valve.
6. Install the cap on the needle valve.

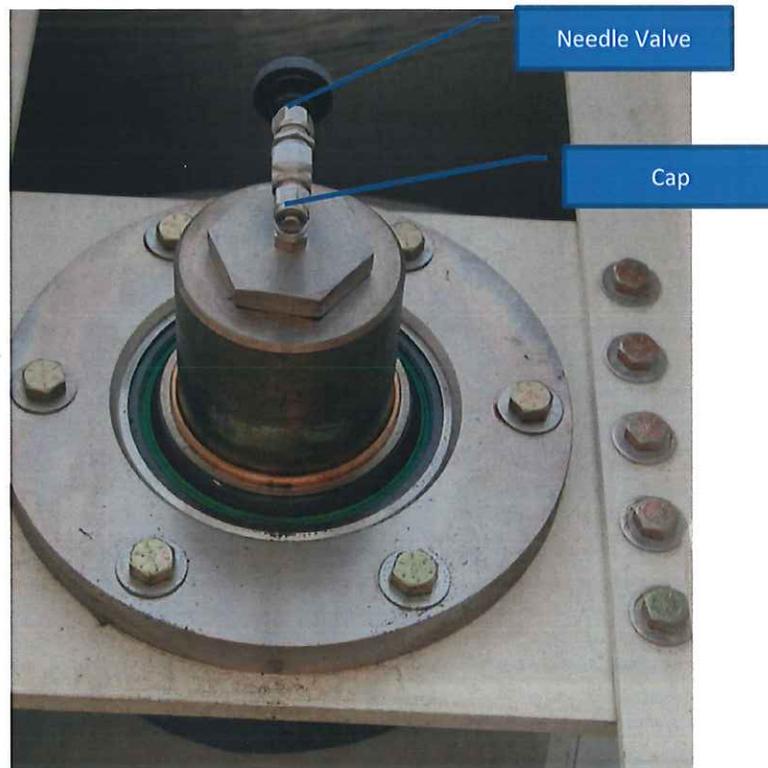


Figure 25 TITAN® Tank Water Drain Valve

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## 12.2 Replacing Plumbing Components

Many of the components can be replaced if necessary. For tubing or valve replacement, the owner must contact Hexagon Composites technical service.

Before replacing any plumbing component of the container, be sure that all lines or components to be replaced are depressurized. This must be done to protect the safety of the individual replacing the component.

**Do not replace any pressure component while pressurized.**

When replacing any components in the gas venting system, be sure to close the  $\frac{1}{4}$  turn valves connected to the tank valves. Drain all system pressure by using the drain valve at the bottom of the filter.

### 12.3 Replacing Fasteners

If replacing fasteners, tighten to specified torque as shown in Table 3.

Table 3: Recommended Torque Values for Fasteners

Torque Table (ft*lbs)		NO MARK		
		NO MARK		
Bolt Size	Grade 2	Grade 5	Grade 8	
1/4-20	-	6 ± 2	6 ± 2	
5/16-18	-	17 ± 2	25 ± 5	
3/8-16	-	31 ± 5	44 ± 5	
1/2-13	-	75 ± 5	106 ± 10	
1/2-20	-	85 ± 5	120 ± 10	
5/8-11	-	150 ± 10	212 ± 10	
SHCS 3/8-24	-	-	49 ± 5	
SHCS 3/8-16	-	-	44 ± 5	
SHCS 1/2-13	-	-	106 ± 10	
HH M5 X 0.8	-	6 ± 2	-	
HH 10-32	6 ± 2	-	-	
SAE Fittings				
Fitting	Torque	Example Fittings		
9/16-18	25 ± 5	Tube -SAE (16067-23)		
3/4-16	40 ± 5	Tube - SAE (16067-34)		
7/8-14	50 ± 5	Tube - SAE (16067-65)		
1 1/16-12	100 ± 10	Tube - SAE (16067-66)		
1 1/8-12	110 ± 10	450 L Tank Valve		
1 3/16-12	120 ± 10	Thermowell Titan*		
1 5/16-12	130 ± 10	Tube to SAE (16070-9C)		
1 7/8-12	200 ± 10	SAE Plug (16657-02), Tank adapter		
2-12	210 ± 10	NGV Tank Valve/Plug		
Special				
PN	Bolt Size	Torque Value		
16008-4	1/2-13 (Cross Beam)	40 ± 5		
16706-16, 174905-01	Valve Tank Head	250 ± 10		
16007-5	5/8 U-Bolt (grade 2)	55 ± 5		
16622-02, 16559-01	Strap pipe	6 ± 2		
16671-01	clamp grounding	6 ± 2		
16636-04	1/4 -20 (tamper screw- side panels)	6 ± 2		
16026-8	½ - 20 x 2" grade 8	108 ± 10		
16636-06	3/8- 16 (tamper screw- roof panels)	20 ± 2		

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## 13 Inspection

The side panels and cover are designed to provide protection to the cylinders and can be used as a way to identify damage that the container may have sustained. The side panels are permanently fastened to the frame. Inspection hatches are included to accommodate inspection requirements. The roof cover is removable and can be taken off using the four threaded lifting eye holes.

The TITAN® side panels and covers protect the cylinders from weather, sunlight, tampering, service conditions, vandalism, and damage caused during transportation. They provide a way for the owner or user to visually check to see if any major damage has occurred. The side covers also protect the gas venting system. During a fire, the side covers shield the cylinders from direct exposure to the flame and radiant heat. This gives the gas venting system time to vent the contents of the cylinders before degradation of the cylinders occurs.

For criteria and procedures for tank inspection, follow Service Bulletin 10-01-002 (Hexagon Composites CNG Bulk Hauling TITAN® Module Inspection Manual). Module inspection may be documented in Hexagon Composites Service Bulletin SB 14-11-001.

### 13.1 Module Inspection

Module (container) inspection is required after 60 months and then every 30 months thereafter. Tank and module inspections should be completed sequentially to match the inspection intervals. Additionally, a module inspection is required in any instance as defined in Service Bulletin 10-01-002 which requires a tank inspection. As with tank inspections, module inspections shall be completed by Hexagon Composites or personnel trained by Hexagon Composites. The module inspection shall include:

1. Inspection of welds
2. Inspection for rust
3. Inspection of fasteners
4. Inspection of the roof panels
5. Inspection of the doors
6. Inspection of the side access covers

### 13.2 Tank Inspection

#### 13.2.1 DOT/ TC approved modules PN 240167-0001-xxx

DOT/ TC approved modules require testing of the tanks at maximum intervals of 5 years throughout their 15 year service life. The testing protocol is currently under development by Hexagon Composites. This service bulletin will be revised upon an approved test protocol. It is recommended that annual visual inspection is performed on the tanks and the module following the guidelines of SB 14-11-001.

#### 13.2.2 ABS Approved Modules PN 240167-0002-xxx

ABS approved modules shall be inspected at maximum intervals of 30 months throughout their 20 year service life. This inspection shall include both the tanks and the module following the guidelines of SB 14-11-001. This inspection only requires a visual inspection of the tanks.

#### 13.2.3 Damage Levels – Reference SB 14-11-001

Tanks involved in an accident must be returned to Hexagon Composites for evaluation. These tanks must be tested using Modal Acoustic Emissions (MAE). Only the Hexagon approved supplier may provide the MAE testing. If there are cuts and scratches on the tank surface from some other event, this may be evaluated using the levels shown in Table 4. Contact Hexagon Composites Technical Service to discuss these damage levels.

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If the tanks were impacted resulting in composite delamination, the following steps should be taken:

1. Move the Module to a well-ventilated area
2. Remove covers, if applicable, and inspect for damage
3. Contact Hexagon Composites

**Hexagon Composites Emergency 844-211-5339**

Table 4 - Damage Levels

Damage Levels	Figures	Inches	Millimeters
Level 1	Level 1 Damage	Less than 0.020	Less than 0.52
Level 2a (Rework in the Field)	Level 2a Damage	0.021 - 0.070	0.53 - 1.78
Level 2b (Factory Inspection)	Level 2b Damage	0.071 - 0.100	1.79 - 2.54
Level 3 (Condemn)	Level 3 Damage	Greater than 0.100	Greater than 2.54

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## 14 Emergency Response Procedure

# EMERGENCY RESPONSE

## Hexagon Composites Emergency 844-211-5339

During the event of an emergency, the emergency response procedure of the authority having jurisdiction shall be carried out. The following emergency response procedure is from the Emergency Response Guide (ERG) 2008 Guide # 115. It is the owner's responsibility to find out what emergency response procedure is required of them by the authority having jurisdiction. In the case of an accident, a manual venting or a transfer of the cargo are options if the cylinders have not been damaged and there is no risk of further damage. To manually vent the cargo, use the following procedure:

1. Position container for unloading procedure ensuring that the container remains stationary (e.g. chock vehicle tires, set vehicle brake, engine off, etc.) and that the vent lines are not obstructed by any infrastructure (e.g. sheds, coverings, etc.).
2. During venting of the cargo, the natural gas must not be allowed to accumulate. The container must not be under a structure of any kind.
3. Open doors.
4. Connect grounding source to grounding lug shown in Figure 5 to prevent static ignition.
5. Open the cylinder valves as highlighted in Figure 8
6. Open the bleed valve as shown in Figure 10.

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The following is taken from the ERG Guide 115 and may or may not apply:

#### POTENTIAL HAZARDS

##### FIRE OR EXPLOSION

- EXTREMELY FLAMMABLE.
- Will be easily ignited by heat, sparks or flames.
- Will form explosive mixtures with air.

**CAUTION: Hydrogen (UN1049), Deuterium (UN1957), Hydrogen, refrigerated liquid (UN1966) and Methane (UN1971) are lighter than air and will rise. Hydrogen and Deuterium fires are difficult to detect since they burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)**

- Vapors may travel to source of ignition and flash back.
- Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.
- Cylinders may explode when heated if not properly vented.
- Ruptured cylinders may rocket.

##### HEALTH

- Vapors may cause dizziness or asphyxiation without warning.
- Some vapors may be irritating if inhaled at high concentrations.
- Contact with gas or decanting gas may cause burns, severe injury and/or frostbite.
- Fire may produce irritating and/or toxic gases.

#### PUBLIC SAFETY

- **CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper is not available or no answer, refer to appropriate telephone number listed in section entitled "Emergency Response Telephone Numbers".**
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). This is not the case for natural gas.
- Keep out of low areas.

##### PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

##### EVACUATION

###### Large Spill

- Consider initial downwind evacuation for at least 800 meters (1/2 mile).

###### Fire

- If tank, rail car, vessel or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.

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**FIRE**

- DO NOT ATTEMPT TO EXTINGUISH A GAS FIRE UNLESS LEAK CAN BE STOPPED.

CAUTION: Hydrogen (UN1049), Deuterium (UN1957) and Hydrogen, refrigerated liquid (UN1966) burn with an invisible flame.

**Hydrogen and Methane mixture, compressed (UN2034) may burn with an invisible flame.**

**Small Fire**

- Dry chemical or CO<sub>2</sub>.

**Large Fire**

- Water spray or fog.
- Move containers from fire area if you can do it without risk.

**Fire involving Cylinders**

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from cylinders engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area to a safe distance threshold and let fire burn.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- If possible, turn leaking containers so that gas escapes
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Do not direct water at spill or source of leak.
- Prevent spreading of vapors through sewers, ventilation systems and confined areas.
- Isolate area until gas has dispersed.

**FIRST AID**

- Move victim to fresh air. • Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Clothing frozen to the skin should be thawed before being removed.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim warm and quiet.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

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**15 EMERGENCY RESPONSE TELEPHONE NUMBERS****Hexagon Composites Emergency 844-211-5339****ARGENTINA**

## 1. CIQUIME

**0-800-222-2933** in the Republic of Argentina

For calls originating elsewhere, call

+54-11-4613-1100

**BRAZIL**

## 1. PRÓ-QUÍMICA

0-800-118270

(Toll-free in Brazil)

For calls originating elsewhere, call

+55-11-232-1144

(Collect calls are accepted)

**COLOMBIA**

## 1. CISPROQUIM

01-800-091-6012 in Colombia

For calls originating in Bogotá, Colombia call

288-6012

For calls originating elsewhere call

+57-1-288-6012

**CANADA**

## 1. CANUTEC

613-996-6666 (Collect calls are accepted)

\*666 cellular (in Canada only)

**DOMINICAN REPUBLIC**

911

**MEXICO**

## 1. SETIQ

**01-800-00-214-00** in the Mexican Republic

For calls originating in Mexico City and the Metropolitan Area

5559-1588

For calls originating elsewhere, call

+52-55-5559-1588

## 2. CENACOM

**01-800-00-413-00** in the Mexican Republic

For calls originating in Mexico City and the Metropolitan Area

5128-0000 exts. 11470, 11471, 11472, 11473, 11474, 11475, 11476 and 11477

For calls originating elsewhere, call

+52-55-5128-0000 exts. 11470, 11471, 11472, 11474, 11475 and 11476

**PERU**

116 Fire

105 Police

**UNITED STATES****The user is responsible for verifying that copies are the current revision before use.**Hexagon Composites, Inc. • 5117 NW 40<sup>th</sup> Street • Lincoln, NE 68524 • Tel 402.470.5000 • Fax 402.470.0019 • www.hexagonlincoln.com

1. CHEMTREC®  
1-800-424-9300  
(Toll-free in the U.S., Canada and the U.S. Virgin Islands)  
**703-527-3887** For calls originating elsewhere  
(Collect calls are accepted)
  
2. CHEMTEL, INC.  
1-888-255-3924  
(Toll-free in the U.S., Canada, Puerto Rico and the U.S. Virgin Islands)  
**813-248-0585** For calls originating elsewhere  
(Collect calls are accepted)
  
3. INFOTRAC  
1-800-535-5053  
(Toll-free in the U.S., Canada and the U.S. Virgin Islands)  
**352-323-3500** For calls originating elsewhere  
(Collect calls are accepted)
  
4. 3E COMPANY  
1-800-451-8346  
(Toll-free in the U.S., Canada and the U.S. Virgin Islands)  
**760-602-8703** For calls originating elsewhere  
(Collect calls are accepted)
  
5. MILITARY SHIPMENTS  
703-697-0218 - Explosives/ammunition incidents  
(Collect calls are accepted)  
1-800-851-8061 - All other dangerous goods incidents
  
6. NATIONWIDE POISON CONTROL CENTER (United States only)  
1-800-222-1222 (toll-free in the U.S.)

**VIETNAM**

- 05 Ambulance
- 08 Fire
- 03 Police

## 16 Description of Terms

**Abrasion Damage:** Damage to composite caused by wearing, grinding or rubbing away of the composite material by friction.

**All-composite (Type 4) Tank:** A fuel tank made from primarily non-metallic materials such as plastic and high strength fiber reinforced composites. The tank may incorporate metal ports for attachment of valves and other plumbing devices.

**Boss (also referred to as "Ports"):** The metal fittings at the ends of the tank, which contain the ports for installation of valves, pressure relief devices, and blank plugs.

**Blunt Impact:** A forceful blow to the surface of the tank, which does not cut, gouge, or significantly indent the surface. This type of impact may induce damage, such as delamination, which is not readily apparent by visual examination.

**Break-away Connection:** A connection used during filling or unloading that reduces plumbing damage by freely breaking away from the fill line.

**Carbon Fiber:** One type of reinforcement fiber used in the composite overwrap.

**CNG:** Compressed Natural Gas.

**Condemned Tank:** A tank that has been damaged beyond repair and must be removed from service and rendered unusable.

**Crazing:** Hairline cracking of the resin, giving it an opaque, "frosty" appearance.

**Cut Damage:** Damage caused by a sharp object in contact with the composite surface that breaks or cuts the composite fibers.

**Cylinder:** Pressure Vessel, also referred to as a tank.

**Cylinder Region:** The cylindrical portion of the tank.

**Door:** A structure hinged and latched protecting the plumbing and interface with the tanks.

**Delamination:** An induced separation between composite layers. This type of damage occurs from localized impact or resin burn out.

**Dome:** The curved end portion of the fuel tank.

**Factory Inspection:** An inspection and evaluation performed at an approved Hexagon Composites facility, utilizing comprehensive testing techniques that are not available for field inspection.

**Field Inspection:** Inspection performed at a location other than a Hexagon Composites facility.

**Fill Line Assembly:** A high-pressure line used to conduct gas into the tank(s) through the plumbing assembly.

**Frame:** General term that is used to describe the metal structure that encloses and supports the tanks, plumbing, doors, side covers, etc.

**Hardware:** General description of valves, PRDs and any other component that will attach to the tanks or the tank related systems.

**Impact Damage:** Damage caused by dropping or by a blow from another object. Impact damage may be at the surface, internal to the structure, or both.

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**Laminate:** Fiber-resin layers that are bonded to adjacent layers.

**Level 1 Damage:** Minor damage that is considered inconsequential to the safe operation of the tank.

**Level 2 Damage:** Damage which is more severe than Level 1 damage. This level of damage is rejectable. Additional evaluation and/or rework may allow the tank to be returned to service.

**Level 3 Damage:** Damage which is sufficiently severe that it is not repairable and renders a tank unfit for continued service. Tanks with Level 3 damage must be condemned and destroyed.

**Liner:** An internal component of the tank that serves as a permeation barrier, preventing leakage of gas through the composite tank structure.

**Maximum Fill Pressure:** The fill pressure allowed in order to obtain a settled service pressure of 15°C (59°F).

**Pressure Relief Device (PRD):** A device installed in direct contact with internal pressure in the tank that will release the contained gas in specific emergency conditions. Excessive temperature, excessive internal pressure, or both may activate the device depending on the PRD design. Thermally activated pressure relief devices are required.

**Qualified Inspector:** An individual who has completed the Hexagon Composites NGV Fuel Tank Training class and is registered with Hexagon Composites with a certificate in response to passing the training class exam. A qualified inspector shall have received proper training and a registered stamp that will allow field inspections of Hexagon Composites fuel tanks.

**Resin:** Epoxy material in the composite overwrap which fills the space and transfers the load between individual reinforcing fibers.

**Service Life:** Specified number of years from the date of manufacture that the tank may be used. The expiration date for a specific tank is printed on the manufacturer's label. A fuel tank is to be destroyed at the end of its service life.

**Service Pressure:** The settled pressure at a uniform gas temperature of 15°C (59°F) and full gas content. Also referred to as nominal, operating, or working pressure.

**Tap Test:** An inspection technique in which the surface of a Hexagon Composites tank is tapped with a small solid object, such as a "Coin", to detect delaminations. A delamination area will emit a different sound than an area that is not damaged.

**Thermally Activated PRD:** A device that activates above a critical temperature.

**Valve, Actuated:** A device installed into one of the ports of the tank that is used to open or close off the gas flow into or out of the tank. The valve is turned on or off by a pressure-driven actuator.

**Valve, Manual:** A device installed into one of the ports of the tank that is used to open or close off the gas flow into or out of the tank. The valve is turned on or off manually with a handle.

**Vent Caps:** Metal spring loaded caps designed to keep moisture and debris out of vent lines.

**Vent Line:** A high-pressure line used to conduct gas from a pressure relief device to a location outside of the container where gas may be safely discharged. Vent lines are required where pressure-carrying components are installed in a closed compartment.

**Trapped Gas:** As referred to in this document, it is the gas or air volume that is trapped between the HDPE liner and the corresponding composite overwrap.

**The user is responsible for verifying that copies are the current revision before use.**

Hexagon Composites, Inc. • 5117 NW 40<sup>th</sup> Street • Lincoln, NE 68524 • Tel 402.470.5000 • Fax 402.470.0019 • www.hexagonlincoln.com

## 17 References

1. CGA C-6.2:2005, Guidelines for Visual Inspection and Requalification of Fiber Reinforced High Pressure Cylinders. Compressed Gas Association, 4221 Walney Road, Suite 500, Chantilly, Virginia, USA 20151, [www.cganet.com](http://www.cganet.com)
2. Emergency Response Guidebook:2008, A Guidebook for First Responders During the Initial Phase of a Dangerous Goods/Hazardous Materials Transportation Incident. U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration, 1200 New Jersey Ave SE, East Building, 2<sup>nd</sup> Floor, Washington, DC 20590, [http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/erg2008\\_eng.pdf](http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/erg2008_eng.pdf)
3. ISO 668:1995, Series 1 Freight Containers-Classification, Dimensions and Ratings. International Organization for Standardization; 1, Rue de Varembe; Case postale 56; CH-1211 Genéva 20, Switzerland; [www.iso.ch](http://www.iso.ch)
4. SB 10-01-002 Hexagon Composites CNG Bulk Hauling TITAN® Module Inspection Manual. Hexagon Composites, 5117 NW 40<sup>th</sup> Street, Lincoln NE, 68524.

## 18 Contact Information

Hexagon Composites  
5117 NW 40<sup>th</sup> Street  
Lincoln, NE 68524  
Phone 1-800-279-TANK  
Web Address: [www.hexagonlincoln.com](http://www.hexagonlincoln.com)

**Hexagon Composites Emergency 844-211-5339**

**Appendix A Filling Checklist**

Date/Time \_\_\_\_\_/\_\_\_\_\_  
 Container Location \_\_\_\_\_  
 Container Serial # \_\_\_\_\_  
 Operator Name \_\_\_\_\_  
 Temperature \_\_\_\_\_

1. Is the container stationary? By what means? Check if yes.

- Brake Set
- Wheels Chocked
- Engine Off
- Transmission in Park
- Other \_\_\_\_\_

2. If the container were to vent, would its contents accumulate underneath a structure? If answer is "yes" then reposition the container to protect against accumulation during a vent. *During a venting of the cargo, the natural gas must not be allowed to accumulate. The natural gas must have an obstruction free vent path.*

- Yes
- No

3. Is the grounding lug connected to an adequate ground source? See Figure 5.

- Yes

4. Are all valves (cylinder valves, manifold valves and bleed valve) in closed position?

- Yes
- No

5. Connect stations fill line to the container's fill line. This system does not include a break-away connection. Owner is responsible for break-away connection on hose or loading arm.

6. Open valves to cylinders that are to be filled.

7. Open manifold valves.

8. Fill cylinders to pressure specified in fill chart, then record pressure.

Cylinders \_\_\_\_\_

9. Shut off flow

10. Close cylinder valves (if used in US or Canada)

11. Close manifold valves.

12. Evacuate stations fill line by opening bleed valve.

13. Disconnect fill line.

14. Make sure all valves are closed.

Internal Gas Temperature (°F)	Internal Gas Temperature (°C)	Max Fill Pressure (psig)	Max Fill Pressure (barg)
-30	-34	1900	131
-10	-23	2200	152
10	-12	2500	172
20	-7	2700	186
30	-1	2900	200
40	4	3000	207
50	10	3200	221
60	16	3400	234
70	21	3600	248
80	27	3700	255
90	32	3900	269
110	43	4200	290
130	54	4500	310

The user is responsible for verifying that copies are the current revision before use.

**Appendix B Transport Checklist**

Date/Time \_\_\_\_\_/\_\_\_\_\_  
Container Serial # \_\_\_\_\_  
Operator Name \_\_\_\_\_  
Origination \_\_\_\_\_  
Destination \_\_\_\_\_

1. Has a pre-approved route been specified?  
Route no. \_\_\_\_\_ or location \_\_\_\_\_
2. Check gas venting system pressure gauge. MUST BE between 185 – 190 PSIG PRIOR TO TRANSPORT.  
Pressure = \_\_\_\_\_psig
3. Check for damage to container. Do not transport container (except if cylinders are empty) if damage is found that has compromised the integrity of the container.
4. Inspect container for signs of leakage (e.g. odorant, sound of leak, visual indications of flow).
5. Check valves to ensure they are in "closed" position. Only close tank valves if used in US or Canada.
6. Check top of vent lines for plug caps. Replace plug caps if missing.
7. Close and secure doors.
8. Ensure corner locks are locked on to chassis.
9. Ensure the tractor and trailer meet the laws and codes by the authority having jurisdiction.
10. Ensure the driver meets all requirements for the authority having jurisdiction.

Notes:

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Appendix C Unloading Checklist

Date/Time \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Container Location \_\_\_\_\_  
Container Serial # \_\_\_\_\_  
Operator Name \_\_\_\_\_

1. Is the container stationary? By what means? Check if yes.

- Brake Set
- Wheels Chocked
- Engine Off
- Transmission in Park
- Other \_\_\_\_\_

2. If the container were to vent, would its contents accumulate underneath a structure? If answer is "yes" then reposition the container to protect against accumulation during a vent. *During a venting of the cargo, the natural gas must not be allowed to accumulate. The natural gas must have an obstruction free vent path.*

- Yes
- No

3. Is the grounding lug connected to an adequate ground source? See Figure 5.

- Yes

4. Are all valves (cylinder valves, manifold valves, and bleed valve) in closed position?

- Yes
- No

5. Connect receiving line to the container's unloading manifold. – This system does not have a break-away connection. Owner is responsible for break-away connection on hose or loading arm.

6. Open Cylinder valves if used in US or Canada.

7. Open manifold valves.

8. Unload cylinders to pressure of 10.3 barg (150 psig) or above.

9. Final system pressure as read from manifold pressure gauge \_\_\_\_\_ psig

10. Close cylinder valves if used in US or Canada.

11. Close manifold valves.

12. Close receiving systems flow valve.

13. Open and close bleed valve to relieve pressure.

14. Disconnect unloading line.

Notes:

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**APPENDIX E – XNG Ocean Spray Cranberries CNG  
Station Operation / Emergency Contact List**



## XNG Ocean Spray Cranberry Operations/Emergency Contact List

June 6 2019

In case of **Operational Question/Issue or Emergency**, please contact the Operational Control Center (OCC). The OCC is manned 24/7 and the dispatchers have been trained to monitor the sites, trouble-shoot issues, and contact the appropriate people in an emergency situation. The numbers are:

- OCC Desk Phone: 857-366-7981
- OCC Cell Phone: 207-351-0127

If you have a **Safety, Regulatory or Product Safety** question please contact:

- **Colin Giles**– XNG Safety & Environmental Director – (857) 319-2038
- If you have an **Emergency** with a CNG trailer please call our Operational Control Center Phone:  
857-

Questions regarding trucking, contact:

- **Bryce Kelly** – XNG Operations/Product Planning Manager - (603) 260-1813

### **Ocean Spray Cranberries**

#### **Ocean Spray Cranberries Contact information**

# APPENDIX Z – Incident Report Form



## Incident Response Form

May 23 2019

INCIDENTS INVOLVING COMPRESSED NATURAL GAS EMERGENCY REPORTING FORM	
Date:	
Time:	
Name:	
Phone:	
Organization:	
Location:	
Contact Person if Different Than Caller:	
Phone of Contact Person:	
Organization of Contact Person:	
WHAT IS THE EMERGENCY?	
WHEN DID IT OCCUR? Date: _____ Time: _____	
WHERE IS THE EMERGENCY? (City, town, rural area, specific directions)	
ARE THERE RESIDENCES, BUSINESSES OR OTHER PLACES WITH PEOPLE IN THE IMMEDIATE AREA?	
HAVE THE LOCAL AUTHORITIES BEEN NOTIFIED? <b><u>IF NOT, NOTIFY THEM</u></b>	
WHO WAS NOTIFIED?	
Name: _____ Telephone Number: _____ Time: _____	
WHAT ACTION HAS BEEN TAKEN? (Medical, evacuation, firefighting?)	
REQUEST FOR ASSISTANCE?	
Trailer Number:	
License Number:	
Driver:	
Carrier:	

**APPENDIX G – XNG CNG TRANSFER  
PROCEDURE**



## XNG CNG Transfer Procedure

May 23 2019

Page 1 of 2

If it is determined that the best course of action is to undertake a transfer of the product in the disabled trailer to a secondary trailer, the following safety procedure would be used by the XNG team.

The Response Team Captain directs Response team to collect Transfer Equipment (in addition to any additional safety equipment required) and proceed to the emergency site. Once at the emergency site, the Response Team takes the following steps to transfer product from the disabled trailer into the empty trailers:

### Transfer Equipment:

- 2 empty trailers
- 16 Foot Transfer Hose
- Bleeder Valve
- 20 lb. ABC fire extinguisher
- Chock blocks, traffic control pylons
- Gas Detection Devices
- Vapor Detection Equipment
- Grounding Wire and Spike

### Transfer Procedure:

- Establish that the site has no ignition sources (power lines, cell phones, two way radios) within 25 feet in any direction.
  - o IF an ignition source exists, DO NOT ATTEMPT TRANSFER
- Place traffic control pylons in position
- Place chock blocks under rear wheels of both trailers
- Ensure Trailer is bonded and grounded
- Lay out hose to ensure sufficient length to connect both trailers
- Visually inspect hose for damage/wear/imperfections that could compromise the hose integrity.
  - o If damage is identified, DO NOT ATTEMPT TRANSFER.
- Place 20 lb. ABC fire extinguisher at the midpoint of hose
- Ensure trailer manifold valves on both trailers are closed and the manifold vent is open.
- Connect hose to empty trailer, following established procedure for transfer hose connection.
- Connect hose to disabled trailer following established procedure for transfer hose



## XNG CNG Transfer Procedure

January 15, 2015

Page 2 of 2

### Transfer Procedure Continued:

- Close manifold vent valves on both trailers
- Slowly open each tank valve (4) and manifold valves (2) on the disabled trailer
  - o NOTE, hose is now pressurized
- Open each tank valve (4) on the empty trailer.
- Slowly and fully open both manifold valves (2) of the empty trailer to begin transferring gas.
- Wait until pressure is equalized between the two trailers.
- Close "empty" trailer's manifold valves (2) and tank valves (4).
- Close disabled trailer's manifold valves (2) and tank valves (4).
- Bleed hose of remaining gas using manifold vent valve on the "empty" trailer. Vent until hose is depressurized.
- Disconnect hose from "empty" trailer and secure coupling to prevent coupling from getting
- Repeat process with subsequent "empty" trailer(s).

**Appendix F**

**Bench sheets and Forms**

BODs Per. Standard Methods 23rd Edition #5210B

Tested by

Time

Incubator Temp.

PARAMETER	EFFLUENT	EFFLUENT	SEED CONTROL CHECK			Glucose / Glutamic Acid Check				BLANK	
Bottle Number			Bottle Number			Bottle Number					
ml of Sample			ml of Sample	9	18	36	ml of Seed	4	4	5	5
% bDilution			DO Initial				ml Glucose Standard	6	6	6	6
DO Initial			DO after 5 Days				% Dilution	2	2	2	2
DO after 5 Days			difference				DO Initial				
difference			Difference / ml of Seed				-Seed Correction Factor				
(difference)(100) / % Dilution = m/l			Average				Corrected DO Initial				
Average mg/l			Seed Correction Factor	4 ml factor			DO After 5 Days				
(mg/l) (8.34) (Q) = lbs per. Day				5 ml factor			Difference				
			EFFLUENT TURBIDITY <input type="text"/> FTU				Difference (100) / % Dilution				
			EFFLUENT Q = <input type="text"/>				Average				

TSS Per. Standard Methods 23rd Edition #2540 D

Tested by

Time

Oven Temp.

PARAMETER	PROCESSED	DUPLICATE	STANDARD	BLANK	MIXED LIQUOR	WEIGHT CHECK
Pan number					DISH	1.0 GR
ml sample					10	1.5 GR
Weight # 2						2.0 GR
Weight # 1						40.0 GR
Difference Wt. 3 = mg/l						50.0 GR
W3(1000) / ml of sample						
(8.34) (Q) = lbs/day						

BURNT WEIGHT= W4

SVI =

$\frac{W2-W4}{W2 - W1} 1000$  = % Solids Volatile

Ocean Spray - Markham Wastewater  
Daily Bench Sheet

EHS-WW-LNF-002\_Daily Bench Sheet

Calendar Month: \_\_\_\_\_

Operators: \_\_\_\_\_

Day	INF Q	EFF Q	RAS Q	OP pH	ML pH	INF pH	EFF FTU	EFF COD	INF COD	Pressing	ML NO3	ML PO4	San c12	FREE c12	N set	P set	Minutes	Surface	Temp	Rain	Blanket	MLSS	DB in/1hr	
1																								
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
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30																								
31																								
Other Samples	Week 1	EFF TEMP	EFF pH	EFF C12	Week 2	EFF TEMP	EFF pH	EFF C12	Week 3	EFF TEMP	EFF pH	EFF C12	Week 4	EFF TEMP	EFF pH	EFF C12	Week 5	EFF TEMP	EFF pH	EFF C12	Quarterly	PHOS	AMMON	

**Appendix G**

**NPDES Permit (2019-2024)**



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300  
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

May 28, 2019

Brett Imsland  
Ocean Spray Cranberries, Inc.  
1480 State Route 105  
Aberdeen, WA 98520

RE: National Pollutant Discharge Elimination System (NPDES) Permit Issuance for Ocean Spray Cranberries, Inc.

Dear Brett Imsland:

Enclosed is NPDES Permit No. WA0003721 for Ocean Spray Cranberries, Inc. The permit is issued by the Department of Ecology (Ecology) in conformance with the Water Pollution Control Law [Chapter 90.48 Revised Code of Washington (RCW)], and as authorized by the U.S. Environmental Protection Agency (EPA) acting under the Federal Clean Water Act.

To ensure Ecology receives your Discharge Monitoring Reports (DMRs) on time by submitting your DMRs electronically. Ecology has an on-line system for facilities to enter DMRs. This system, WAWebDMR, will allow all permit types to enter data into a secure on-line system. For more information please go to the WAWebDMR home page: <http://www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html>.

Submission of an application for permit renewal or continued discharge must be received by Ecology no later than **July 1, 2023** [Washington Administrative Code (WAC) 173-220-180]. Please contact Melinda Wilson, Permit Administrator, by e-mail at [melinda.wilson@ecy.wa.gov](mailto:melinda.wilson@ecy.wa.gov) or (360) 407-6280, for an application form.

#### Permit Fees

Ecology, in response to the passage of Initiative 97 in 1988, has adopted a regulation to recover costs associated with the issuance and administration of wastewater discharge permits (Chapter 173-220 WAC).

The annual fee for both industrial and municipal/domestic discharges is computed according to the permit fee schedules contained in WAC 173-224-040. Ecology notifies permit holders of fee changes by mailed billing statements. Failure to pay the applicable permit fee may result in the suspension or revocation of the permit, and could result in the issuance of civil penalties or actions to enjoin the activity under the permit.

#### Appeal Process

You have the right to appeal this permit within 30 days upon receipt of this document. Pursuant to Chapter 43.21B RCW, your appeal must be filed with the Pollution Control Hearings Board, and served on the Department of Ecology, within 30 days of the date of your receipt of this document.

If you choose to appeal this decision, your notice of appeal must contain: (1) a copy of the permit you are appealing, and (2) a copy of the application for the permit/modification.

Any appeal must contain the following in accordance with the rules of the Hearings Board:



Brett Imsland  
May 28, 2019  
Page 2

- a. The appellant's name and address;
- b. The coverage date and number of the permit appealed;
- c. A description of the substance within the permit that is the subject of the appeal;
- d. A clear, separate, and concise statement of every error alleged to have been committed;
- e. A clear and concise statement of the facts which the requester relies to sustain his or her statements of error; and
- f. A statement setting forth the relief sought.

**ADDRESS AND LOCATION INFORMATION**

Street Addresses	Mailing Addresses
<b>Department of Ecology</b> Attn: Appeals Processing Desk 300 Desmond Drive Southeast Lacey, WA 98503	<b>Department of Ecology</b> Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
<b>Pollution Control Hearings Board</b> 1111 Israel Road Southwest, Suite 301 Tumwater, WA 98501	<b>Pollution Control Hearings Board</b> PO Box 40903 Olympia, WA 98504-0903

*For additional information: Environmental Hearings Office Website: <https://ecology.wa.gov/Regulations-Permits/Compliance-enforcement/Overview-of-compliance-enforcement>*

If you have any questions on this action, please contact Aziz Mahar by e-mail at [azizullah.mahar@ecy.wa.gov](mailto:azizullah.mahar@ecy.wa.gov) or (360) 407-6290.

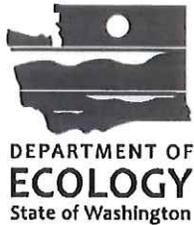
Sincerely,



Rich Doenges  
Southwest Region Manager  
Water Quality Program

RD:CC(0003721)  
Enclosures

**CERTIFIED MAIL: 9489 0090 0027 6019 6821 72**



Issuance Date: May 28, 2019  
Effective Date: July 1, 2019  
Expiration Date: June 30, 2024

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM  
WASTE DISCHARGE PERMIT NO. WA0003271**

State of Washington  
DEPARTMENT OF ECOLOGY  
Southwest Regional Office  
P.O. Box 47775  
Olympia, WA 98504-7775

In compliance with the provisions of  
The State of Washington Water Pollution Control Law  
Chapter 90.48 Revised Code of Washington  
and  
The Federal Water Pollution Control Act  
(The Clean Water Act)  
Title 33 United States Code, Section 1342 et seq.

**Ocean Spray Cranberries, Inc.**  
**1480 State Route 105**  
**Aberdeen, WA 98520**

is authorized to discharge in accordance with the Special and General Conditions that follow.

<b>Facility Location:</b> 1480 State Route 105 Aberdeen, WA 98520	<b>Receiving Water:</b> Grays Harbor Estuary, Mouth of John River
<b>Treatment Type:</b> Activated Sludge, Clarifier, UV disinfection system	<b>SIC Code:</b> 2037
<b>Industry Type:</b> Cranberry Processing	<b>NAICS Code:</b> 311411
	<b>Categorical Industry:</b> 40 CFR Part 407.62

A handwritten signature in blue ink that reads "Rich Doenges".

Rich Doenges  
Southwest Region Manager  
Water Quality Program  
Washington State Department of Ecology

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**SUMMARY OF PERMIT REPORT SUBMITTALS**

Refer to the Special and General Conditions of this permit for additional submittal requirements.

<b>Permit Section</b>	<b>Submittal</b>	<b>Frequency</b>	<b>First Submittal Date</b>
S3.A	Discharge Monitoring Report (DMR)	Monthly	August 15, 2019
S3.A	Discharge Monitoring Report (DMR)	Quarterly	October 15, 2019
S3.F	Reporting Permit Violations	As necessary	
S4.A	Operations and Maintenance Manual	1/permit cycle	July 1, 2023
S4.B	Reporting Bypasses	As necessary	
S5.C	Solid Waste Control Plan	1/permit cycle	July 1, 2023
S5.C	Modification to Solid Waste Plan	As necessary	
S6	Application for Permit Renewal	1/permit cycle	July 1, 2023
S7	Non-Routine and Unanticipated Discharges	As necessary	
S8	Spill Plan	1/permit cycle, updates submitted as necessary	July 1, 2020
S9.A	Mixing Zone Plan of Study	1/permit cycle	July 1, 2020
S9.A	Effluent Mixing Study Report	1/permit cycle	July 1, 2023
S10	Outfall Evaluation	1/permit cycle	July 1, 2023
G1	Notice of Change in Authorization	As necessary	
G4	Permit Application for Substantive Changes to the Discharge	As necessary	
G5	Engineering Report for Construction or Modification Activities	As necessary	
G7	Notice of Permit Transfer	As necessary	
G10	Duty to Provide Information	As necessary	
G21	Compliance Schedules	As necessary	

**SPECIAL CONDITIONS**

S1. DISCHARGE LIMITS

A. Process Wastewater Discharges

All discharges and activities authorized by this permit must be consistent with the terms and conditions of this permit.

The discharge of any of the following pollutants more frequently than, or at a level in excess of that identified and authorized by this permit violates the terms and conditions of this permit.

Beginning on the effective date of this permit, the Permittee is authorized to discharge process water and domestic wastewater to the Grays Harbor Estuary at the permitted location subject to complying with the following limits:

<b>Effluent Limits: Outfall 001</b>		
<b>Latitude 46.90509 Longitude -124.00033</b>		
<b>Parameter</b>	<b>Average Monthly <sup>a</sup></b>	<b>Maximum Daily <sup>b</sup></b>
Biochemical Oxygen Demand (5-day) (BOD <sub>5</sub> )	1.03 lbs/1000 lbs of raw cranberries	1.71 lbs/1000 lbs of raw cranberries
BOD <sub>5</sub>	1.13 lbs/1000 lbs of dried fruit	1.86 lbs/1000 lbs of dried fruit
BOD <sub>5</sub>	0.05 lbs/day/person	0.07 lbs/day/person
Total Suspended Solids (TSS)	2.14 lbs/1000 lbs of raw cranberries	3.06 lbs/1000 lbs of raw cranberries
TSS	2.34 lbs/1000 lbs of dried fruit	3.34 lbs/1000 lbs of dried fruit
TSS	0.05 lbs/day/person	0.07 lbs/day/person
	<b>Minimum</b>	<b>Maximum</b>
pH	6.0 standard units	9.0 standard units
<b>Parameter</b>	<b>Monthly Geometric Mean</b>	<b>Maximum Daily <sup>b</sup></b>
Fecal Coliform Bacteria <sup>c</sup>	200/100 milliliter (mL)	400/100 mL
a	Average monthly effluent limit means the highest allowable average of daily discharges over a calendar month. To calculate the discharge value to compare to the limit, you add the value of each daily discharge measured during a calendar month and divide this sum by the total number of daily discharges measured.	
b	Maximum daily effluent limit is the highest allowable daily discharge. The daily discharge is the average discharge of a pollutant measured during a calendar day. For pollutants with limits expressed in units of mass, calculate the daily discharge as the total mass of the pollutant discharged over the day. This does not apply to pH or temperature.	

<b>Effluent Limits: Outfall 001</b>	
<b>Latitude 46.90509 Longitude -124.00033</b>	
c	Ecology provides directions to calculate the monthly geometric mean in publication No. 04-10-020, Information Manual for Treatment Plant Operators available at: <a href="https://fortress.wa.gov/ecy/publications/SummaryPages/0410020.html">https://fortress.wa.gov/ecy/publications/SummaryPages/0410020.html</a>

B. Mixing Zone Authorization

**Mixing Zone for Outfall 001**

The following paragraphs define the maximum boundaries of the mixing zones:

**Chronic Mixing Zone**

The mixing zone is a circle with radius of 205 feet (62.5 meters) measured from the center of each discharge port. The mixing zone extends from the bottom to the top of the water column. The concentration of pollutants at the edge of the chronic zone must meet chronic aquatic life criteria and human health criteria.

**Acute Mixing Zone**

The acute mixing zone is a circle with radius of 20.5 feet (6.25 meters) measured from the center of each discharge port. The mixing zone extends from the bottom to the top of the water column. The concentration of pollutants at the edge of the acute zone must meet acute aquatic life criteria.

<b>Available Dilution (dilution factor)</b>	
Acute Aquatic Life Criteria	31
Chronic Aquatic Life Criteria	227
Human Health Criteria - Carcinogen	227
Human Health Criteria - Non-carcinogen	227

S2. MONITORING REQUIREMENTS

A. Monitoring Schedule

The Permittee must monitor in accordance with the following schedule and the requirements specified in Appendix A.

<b>Wastewater Effluent</b>			
Flow	MGD	Continuous <sup>#</sup>	Metered/recorded
Production, raw cranberries processed	lbs/day	1/week	Records
Production, dried fruit	lbs/day	1/week	Records

Wastewater Effluent			
Total chlorine residual	ug/L	1/week	Grab <sup>d</sup>
pH	standard units	1/week	Grab
BOD <sub>5</sub>	mg/L	1/week	24- hour composite <sup>b,c</sup>
BOD <sub>5</sub>	lbs/day	1/week	Calculated <sup>e</sup>
Temperature <sup>f</sup>	°C	1/week	Measurement
TSS	mg/L	1/week	24- hour composite
TSS	lbs/day	1/week	Calculated
Total Ammonia	mg/L as N	Quarterly <sup>g</sup>	24- hour composite
Phosphorus (Total)	mg/L as Phosphorus	Quarterly	24- hour composite
Fecal Coliform <sup>h</sup>	#/100 mL	1/week	Grab
Priority Pollutants (PP) – Total Metals	µg/L; ng/L for mercury	Quarterly	24-Hour composite Grab for mercury
a	Continuous means uninterrupted except for brief lengths of time for calibration, power failure, or unanticipated equipment repair or maintenance. The time interval for the associated data logger must be no greater than 30 minutes. The Permittee must sample daily when continuous monitoring is not possible.		
b	24-hour composite means a series of individual samples collected over a 24-hour period into a single container, and analyzed as one sample.		
c	Sampling must not occur when ultraviolet light (UV) disinfection system is in operation.		
d	Grab means an individual sample collected over a fifteen (15) minute, or less, period.		
e	Calculated means figured concurrently with the respective sample, using the following formula: Concentration (in mg/L) X Flow (in MGD) X Conversion Factor (8.34) = lbs/day		
f	Temperature grab sampling must occur when the effluent is at or near its daily maximum temperature, which usually occurs in the late afternoon. If measuring temperature continuously, the Permittee must determine and report a daily maximum from half-hour measurements in a 24-hour period. Continuous monitoring instruments must achieve an accuracy of 0.2 degrees C and the Permittee must verify accuracy annually.		
g	Quarterly sampling periods are January through March, April through June, July through September, and October through December. The Permittee must begin quarterly monitoring for the quarter beginning on <b>July 1, 2019</b> , and submit results by <b>October 15, 2019</b> .		
h	Report a numerical value for fecal coliforms following the procedures in Ecology's <i>Information Manual for Wastewater Treatment Plant Operators</i> , Publication Number 04-10-020 available at: <a href="https://fortress.wa.gov/ec/publications/SummaryPages/0410020.html">https://fortress.wa.gov/ec/publications/SummaryPages/0410020.html</a> . Do not report a result as too numerous to count (TNTC).		

B. Sampling and Analytical Procedures

Samples and measurements taken to meet the requirements of this permit must represent the volume and nature of the monitored parameters, including representative sampling of

any unusual discharge or discharge condition, including bypasses, upsets, and maintenance-related conditions affecting effluent quality.

Sampling and analytical methods used to meet the monitoring requirements specified in this permit must conform to the latest revision of the *Guidelines Establishing Test Procedures for the Analysis of Pollutants* contained in 40 CFR Part 136 (or as applicable in 40 CFR subchapters N [Parts 400–471] or O [Parts 501-503]) unless otherwise specified in this permit. Ecology may only specify alternative methods for parameters without limits and for those parameters without an EPA approved test method in 40 CFR Part 136.

C. Flow Measurement, Field Measurement, and Continuous Monitoring Devices

The Permittee must:

1. Select and use appropriate flow measurement, field measurement, and continuous monitoring devices and methods consistent with accepted scientific practices.
2. Install, calibrate, and maintain these devices to ensure the accuracy of the measurements is consistent with the accepted industry standard, the manufacturer's recommendation, and approved O&M manual procedures for the device and the wastestream.
3. Calibrate continuous monitoring instruments weekly unless it can demonstrate a longer period is sufficient based on monitoring records. The Permittee:
  - a. May calibrate apparatus for continuous monitoring of dissolved oxygen by air calibration.
  - b. Must calibrate continuous pH measurement instruments using a grab sample analyzed in the lab with a pH meter calibrated with standard buffers and analyzed within 15 minutes of sampling.
  - c. Must calibrate continuous chlorine measurement instruments using a grab sample analyzed in the laboratory within 15 minutes of sampling.
  - d. Calibrate flow-monitoring devices at a minimum frequency of at least one calibration per year.
4. Calibrate micro-recording temperature devices, known as thermistors, using protocols from Ecology's Quality Assurance Project Plan Development Tool (*Standard Operating Procedures for Continuous Temperature Monitoring of Fresh Water Rivers and Streams Version 1.0 10/26/2011*). This document is available online at:  
<https://fortress.wa.gov/ecy/publications/documents/1803205.pdf>  
Calibration as specified in this document is not required if the Permittee uses recording devices certified by the manufacturer.
5. Use field measurement devices as directed by the manufacturer and do not use reagents beyond their expiration dates.

6. Establish a calibration frequency for each device or instrument in the O&M manual that conforms to the frequency recommended by the manufacturer.
7. Maintain calibration records for at least three years.

D. Laboratory Accreditation

The Permittee must ensure that all monitoring data required by Ecology for permit specified parameters is prepared by a laboratory registered or accredited under the provisions of chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. Flow, temperature, settleable solids, conductivity, pH, and internal process control parameters are exempt from this requirement. The Permittee must obtain accreditation for conductivity and pH if it must receive accreditation or registration for other parameters.

E. Request for Reduction in Monitoring

The Permittee may request a reduction of the sampling frequency after 12 months of monitoring. Ecology will review each request and at its discretion grant the request when it reissues the permit or by a permit modification.

The Permittee must:

1. Provide a written request.
2. Clearly state the parameters for which it is requesting reduced monitoring.
3. Clearly state the justification for the reduction.

S3. REPORTING AND RECORDING REQUIREMENTS

The Permittee must monitor and report in accordance with the following conditions. Falsification of information submitted to Ecology is a violation of the terms and conditions of this permit.

A. Discharge Monitoring Reports

The first monitoring period begins on the effective date of the permit (unless otherwise specified). The Permittee must:

1. Summarize, report, and submit monitoring data obtained during each monitoring period on the electronic discharge monitoring report (DMR) form provided by Ecology within the Water Quality Permitting Portal. Include data for each of the parameters tabulated in Special Condition S2 and as required by the form. Report a value for each day sampling occurred (unless specifically exempted in the permit) and for the summary values (when applicable) included on the electronic form.

To find out more information and to sign up for the Water Quality Permitting Portal go to: <http://ecyapwq/wqwebportal/>

2. Ensure that DMRs are electronically submitted no later than the dates specified below, unless otherwise specified in this permit.

3. Submit DMRs for parameters with the monitoring frequencies specified in S2 (monthly, quarterly, annual, etc.) at the reporting schedule identified below. The Permittee must:
  - a. Submit **monthly** DMRs by the 15<sup>th</sup> day of the following month.
  - b. Submit **quarterly** DMRs, unless otherwise specified in the permit, by the 15<sup>th</sup> day of the month following the monitoring period. Quarterly sampling periods are January through March, April through June, July through September, and October through December. The Permittee must submit the first quarterly DMR on October 15, 2019, for the quarter beginning on July 1, 2019.
4. Enter the "No Discharge" reporting code for an entire DMR, for a specific monitoring point, or for a specific parameter as appropriate, if the Permittee did not discharge wastewater or a specific pollutant during a given monitoring period.
5. Report single analytical values below detection as "less than the detection level (DL)" by entering < followed by the numeric value of the detection level (e.g. < 2.0) on the DMR. If the method used did not meet the minimum DL and quantitation level (QL) identified in the permit, report the actual QL and DL in the comments or in the location provided.
6. Report single analytical values between the detection level (DL) and the quantitation level (QL) by entering the estimated value, the code for estimated value/below quantitation limit (j) and any additional information in the comments. Submit a copy of the laboratory report as an attachment using WQWebDMR.
7. Do not report zero for bacteria monitoring. Report as required by the laboratory method.
8. Calculate and report an arithmetic average value for each day for bacteria if multiple samples were taken in one day.
9. Calculate the geometric mean values for bacteria (unless otherwise specified in the permit) using:
  - a. The reported numeric value for all bacteria samples measured above the detection value except when it took multiple samples in one day. If the Permittee takes multiple samples in one day it must use the arithmetic average for the day in the geometric mean calculation.
  - b. The detection value for those samples measured below detection.
10. Report the test method used for analysis in the comments if the laboratory used an alternative method not specified in the permit and as allowed in Appendix A.
11. Calculate average values and calculated total values (unless otherwise specified in the permit) using:

- a. The reported numeric value for all parameters measured between the detection value and the quantitation value for the sample analysis.
  - b. One-half the detection value (for values reported below detection) if the lab detected the parameter in another sample from the same monitoring point for the reporting period.
  - c. Zero (for values reported below detection) if the lab did not detect the parameter in another sample for the reporting period.
12. Report single-sample grouped parameters (for example: priority pollutants, PAHs, pulp and paper chlorophenolics, TTOs) on the WQWebDMR form and include: sample date, concentration detected, detection limit (DL) (as necessary), and laboratory quantitation level (QL) (as necessary).

The Permittee must also submit an electronic copy of the laboratory report as an attachment using WQWebDMR. The contract laboratory reports must also include information on the chain of custody, QA/QC results, and documentation of accreditation for the parameter.

B. Permit Submittals and Schedules

The Permittee must use the Water Quality Permitting Portal – Permit Submittals application (unless otherwise specified in the permit) to submit all other written permit-required reports by the date specified in the permit.

When another permit condition requires submittal of a paper (hard-copy) report, the Permittee must ensure that it is postmarked or received by Ecology no later than the dates specified by this permit. Send these paper reports to Ecology at:

Water Quality Permit Coordinator  
Department of Ecology  
Southwest Regional Office  
PO Box 47775  
Olympia, WA 98504-7775

C. Records Retention

The Permittee must retain records of all monitoring information for a minimum of three years. Such information must include all calibration and maintenance records and all original recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit. The Permittee must extend this period of retention during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by Ecology.

D. Recording of Results

For each measurement or sample taken, the Permittee must record the following information:

1. The date, exact place, method, and time of sampling or measurement.
2. The individual who performed the sampling or measurement.
3. The dates the analyses were performed.
4. The individual who performed the analyses.
5. The analytical techniques or methods used.
6. The results of all analyses.

E. Additional Monitoring by the Permittee

If the Permittee monitors any pollutant more frequently than required by Special Condition S2 of this permit, then the Permittee must include the results of such monitoring in the calculation and reporting of the data submitted in the Permittee's DMR unless otherwise specified by Special Condition S2.

F. Reporting Permit Violations

The Permittee must take the following actions when it violates or is unable to comply with any permit condition:

1. Immediately take action to stop, contain, and cleanup unauthorized discharges or otherwise stop the noncompliance and correct the problem.
2. If applicable, immediately repeat sampling and analysis. Submit the results of any repeat sampling to Ecology within 30 days of sampling.

a. Immediate Reporting

The Permittee must immediately report to Ecology and the Department of Health, Shellfish Program (at the numbers listed below), all:

- Failures of the disinfection system.
- Collection system overflows discharging to marine surface waters.
- Plant bypasses discharging to marine surface waters.

Southwest Regional Office	360-407-6300
Department of Health,	360-236-3330 (business hours)
Shellfish Program	360-789-8962 (after business hours)

b. Twenty-Four-Hour Reporting

The Permittee must report the following occurrences of noncompliance by telephone, to Ecology at the telephone numbers listed above, within 24 hours from the time the Permittee becomes aware of any of the following circumstances:

- i. Any noncompliance that may endanger health or the environment, unless previously reported under immediate reporting requirements.
- ii. Any unanticipated bypass that causes an exceedance of any effluent limit in the permit (See Part S4.B., "Bypass Procedures").
- iii. Any upset that causes an exceedance of an effluent limit in the permit (See G.15, "Upset").
- iv. Any violation of a maximum daily or instantaneous maximum discharge limit for any of the pollutants in Section S1.A of this permit.
- v. Any overflow prior to the treatment works, whether or not such overflow endangers health or the environment or exceeds any effluent limit in the permit. This requirement does not include industrial process wastewater overflows to impermeable surfaces which are collected and routed to the treatment works.

c. Report within Five Days

The Permittee must also submit a written report within five days of the time that the Permittee becomes aware of any reportable event under subparts a or b, above. The report must contain:

- i. A description of the noncompliance and its cause.
- ii. The period of noncompliance, including exact dates and times.
- iii. The estimated time the Permittee expects the noncompliance to continue if not yet corrected.
- iv. Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.
- v. If the noncompliance involves an overflow prior to the treatment works, an estimate of the quantity (in gallons) of untreated overflow.

d. Waiver of Written Reports

Ecology may waive the written report required in subpart c, above, on a case-by-case basis upon request if the Permittee has submitted a timely oral report.

e. All other Permit Violation Reporting

The Permittee must report all permit violations, which do not require immediate or within 24 hours reporting, when it submits monitoring reports for S3.A ("Discharge monitoring reports"). The reports must

contain the information listed in subpart c, above. Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with the terms and conditions of this permit or the resulting liability for failure to comply.

G. Other Reporting

1. Spills of Oil or Hazardous Materials

The Permittee must report a spill of oil or hazardous materials in accordance with the requirements of RCW 90.56.280 and chapter 173-303-145. You can obtain further instructions at the following website: <https://ecology.wa.gov/About-us/Get-involved/Report-an-environmental-issue/Report-a-spill>.

2. Failure to Submit Relevant or Correct Facts

Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, or in any report to Ecology, it must submit such facts or information promptly.

H. Maintaining a Copy of this Permit

The Permittee must keep a copy of this permit at the facility and make it available upon request to Ecology inspectors.

S4. OPERATION AND MAINTENANCE

The Permittee must, at all times, properly operate and maintain all facilities or systems of treatment and control (and related appurtenances), which are installed to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance also includes keeping a daily operation logbook (paper or electronic), adequate laboratory controls, and appropriate quality assurance procedures. This provision of the permit requires the Permittee to operate backup or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of this permit.

The Permittee must schedule any facility maintenance, which might require interruption of wastewater treatment and degrade effluent quality, during non-critical water quality periods and carry this maintenance out according to the approved O&M manual or as otherwise approved by Ecology.

A. Operations and Maintenance (O&M) Manual

1. O&M Manual Submittal and Requirements

The Permittee must:

- a. Update the O&M Manual that meets the requirements of 173-240-150 WAC and submit it to Ecology for approval by **July 1, 2023**.
- b. Submit to Ecology for review and approval substantial changes or updates to the O&M Manual whenever it incorporates them into the manual.

- c. Keep the approved O&M Manual at the permitted facility.
  - d. Follow the instructions and procedures of this manual.
2. O&M Manual Components

In addition to the requirements of WAC 173-240-150, the O&M Manual must be consistent with the guidance in Table G1-3 in the *Criteria for Sewage Works Design* (Orange Book) 2008. The O&M Manual must include:

- a. Emergency procedures for plant shutdown and cleanup in the event of a wastewater system upset or failure.
- b. A review of system components which if failed could pollute surface water or could impact human health. Provide a procedure for a routine schedule of checking the function of these components.
- c. Wastewater system maintenance procedures that contribute to the generation of process wastewater.
- d. Any directions to maintenance staff when cleaning, or maintaining other equipment or performing other tasks which are necessary to protect the operation of the wastewater system (for example, defining maximum allowable discharge rate for draining a tank, blocking all floor drains before beginning the overhaul of a stationary engine).
- e. Wastewater sampling protocols and procedures for compliance with the sampling and reporting requirements in the wastewater discharge permit.
- f. Minimum staffing adequate to operate and maintain the treatment processes and carry out compliance monitoring required by the permit.
- g. Treatment plant process control monitoring schedule.

B. Bypass Procedures

A bypass is the intentional diversion of waste streams from any portion of a treatment facility. This permit prohibits all bypasses except when the bypass is for essential maintenance, as authorized in special condition S4.B.1, or is approved by Ecology as an anticipated bypass following the procedures in S4.B.2.

- 1. Bypass for essential maintenance without the potential to cause violation of permit limits or conditions.

This permit allows bypasses for essential maintenance of the treatment system when necessary to ensure efficient operation of the system. The Permittee may bypass the treatment system for essential maintenance only if doing so does not cause violations of effluent limits. The Permittee is not required to notify Ecology when bypassing for essential maintenance. However the Permittee must comply with the monitoring requirements specified in special condition S2.B.

2. Anticipated bypasses for non-essential maintenance

Ecology may approve an anticipated bypass under the conditions listed below. This permit prohibits any anticipated bypass that is not approved through the following process.

- a. If a bypass is for non-essential maintenance, the Permittee must notify Ecology, if possible, at least 10 days before the planned date of bypass. The notice must contain:
  - A description of the bypass and the reason the bypass is necessary.
  - An analysis of all known alternatives which would eliminate, reduce, or mitigate the potential impacts from the proposed bypass.
  - A cost-effectiveness analysis of alternatives.
  - The minimum and maximum duration of bypass under each alternative.
  - A recommendation as to the preferred alternative for conducting the bypass.
  - The projected date of bypass initiation.
  - A statement of compliance with SEPA.
  - A request for modification of water quality standards as provided for in WAC 173-201A-410, if an exceedance of any water quality standard is anticipated.
  - Details of the steps taken or planned to reduce, eliminate, and prevent recurrence of the bypass.
- b. For probable construction bypasses, the Permittee must notify Ecology of the need to bypass as early in the planning process as possible. The Permittee must consider the analysis required above during the project planning and design process. The project-specific engineering report as well as the plans and specifications must include details of probable construction bypasses to the extent practical. In cases where the Permittee determines the probable need to bypass early, the Permittee must continue to analyze conditions up to and including the construction period in an effort to minimize or eliminate the bypass.
- c. Ecology will determine if the Permittee has met the conditions of special condition S4.B.2 a and b and consider the following prior to issuing a determination letter, an administrative order, or a permit modification as appropriate for an anticipated bypass:

- If the Permittee planned and scheduled the bypass to minimize adverse effects on the public and the environment.
- If the bypass is unavoidable to prevent loss of life, personal injury, or severe property damage. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
- If feasible alternatives to the bypass exist, such as:
  - The use of auxiliary treatment facilities.
  - Retention of untreated wastes.
  - Stopping production.
  - Maintenance during normal periods of equipment downtime, but not if the Permittee should have installed adequate backup equipment in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance.
  - Transport of untreated wastes to another treatment facility.

## S5. SOLID WASTES

### A. Solid Waste Handling

The Permittee must handle and dispose of all solid waste material in such a manner as to prevent its entry into state ground or surface water.

### B. Leachate

The Permittee must not allow leachate from its solid waste material to enter state waters without providing all known, available, and reasonable methods of treatment, nor allow such leachate to cause violations of the State Surface Water Quality Standards, Chapter 173-201A WAC, or the State Ground Water Quality Standards, Chapter 173-200 WAC. The Permittee must apply for a permit or permit modification as may be required for such discharges to state ground or surface waters.

### C. Solid Waste Control Plan

The Permittee must submit all proposed revisions or modifications to the solid waste control plan to Ecology for review and approval at least 30 days prior to implementation. The Permittee must comply with the approved solid waste control plan and any

modifications once approved. The Permittee must submit an update of the solid waste control plan by **July 1, 2023**.

S6. APPLICATION FOR PERMIT RENEWAL OR MODIFICATION FOR FACILITY CHANGES

The Permittee must submit an application for renewal of this permit by **July 1, 2023**. The renewal application should also include a summary of three years data of the parameters that are required under permit condition S2.

The Permittee must also submit a new application or addendum at least 180 days prior to commencement of discharges, resulting from the activities listed below, which may result in permit violations. These activities include any facility expansions, production increases, or other planned changes, such as process modifications, in the permitted facility.

S7. NON-ROUTINE AND UNANTICIPATED WASTEWATER

- A. Beginning on the effective date of this permit, the Permittee is authorized to discharge non-routine wastewater or unanticipated wastewater and therefore not listed on the permit application, on a case-by-case basis if approved by Ecology. Prior to any such discharge, the Permittee must contact Ecology and **at a minimum** provide the following information:
1. The proposed discharge location.
  2. The nature of the activity that will generate the discharge.
  3. Any alternatives to the discharge, such as reuse, storage, or recycling of the water.
  4. The total volume of water it expects to discharge.
  5. The results of the chemical analysis of the water.
  6. The date of proposed discharge.
  7. The expected rate of discharge discharged, in gallons per minute.
- B. The Permittee must analyze the water for all constituents limited for the discharge and report them as required by subpart A.5 above. The analysis must also include any parameter deemed necessary by Ecology. All discharges must comply with the effluent limits as established in Special Condition S1 of this permit, water quality standards, and any other limits imposed by Ecology.
- C. The Permittee must limit the discharge rate, as referenced in subpart 1.g above, so it will not cause erosion of ditches or structural damage to culverts and their entrances or exits.
- D. The discharge cannot proceed until Ecology has reviewed the information provided and has authorized the discharge by letter to the Permittee or by an Administrative Order. Once approved and if the proposed discharge is to a municipal storm drain, the Permittee must obtain prior approval from the municipality and notify it when it plans to discharge.

S8. SPILL CONTROL PLAN

A. Spill Control Plan Submittals and Requirements

The Permittee must:

1. Submit to Ecology a spill control plan for the prevention, containment, and control of spills or unplanned releases of pollutants **by July 1, 2020**.
2. Review the plan at least annually and update the spill plan as needed.
3. Send changes to the plan to Ecology.
4. Follow the plan and any supplements throughout the term of the permit.

B. Spill Control Plan Components

The spill control plan must include the following:

1. A list of all oil and petroleum products and other materials used and/or stored on-site, which when spilled, or otherwise released into the environment, designate as Dangerous Waste (DW) or Extremely Hazardous Waste (EHW) by the procedures set forth in WAC 173-303-070. Include other materials used and/or stored on-site which may become pollutants or cause pollution upon reaching state's waters.
2. A description of preventive measures and facilities (including an overall facility plot showing drainage patterns) which prevent, contain, or treat spills of these materials.
3. A description of the reporting system the Permittee will use to alert responsible managers and legal authorities in the event of a spill.
4. A description of operator training to implement the plan.

The Permittee may submit plans and manuals required by 40 CFR Part 112, contingency plans required by Chapter 173-303 WAC, or other plans required by other agencies, which meet the intent of this section.

S9. MIXING STUDY

A. General Requirements

The Permittee must:

1. Submit a Plan of Study to Ecology for review by **July 1, 2020** prior to initiation of the effluent mixing study.
2. Use the Guidance for Conducting Mixing Zone Analyses (Appendix C of Ecology's *Permit Writer's Manual*, 2015) and the protocols identified in S11.C.
3. Include the results of the effluent mixing study in the Effluent Mixing Report and submit it to Ecology for approval **by July 1, 2023**.

4. If the results of the mixing study, toxicity tests, and chemical analysis indicate that the concentration of any pollutant(s) exceeds or has a reasonable potential to exceed the state water quality standards, chapter 173-201A WAC, Ecology may issue an administrative order to require a reduction of pollutants or modify this permit to impose effluent limits to meet the water quality standards.

B. Reporting Requirements

The mixing zone study must include:

1. A statement confirming that AKART has been applied to the discharge.
2. A description of the size of the mixing zone allowed under chapter 173-201A WAC.
3. An analysis showing how mixing zones have been minimized using the lowest dilution from hydraulic limitations, width limitations, distance limitations and those predicted by the model.
4. A clear description of the critical conditions used for dilution factors:
  - a. For ambient marine waters (and reversing flows e.g., tidally-influenced rivers) use 10<sup>th</sup> or 90<sup>th</sup> percentile current velocity for acute and 50<sup>th</sup> percentile tidal current velocity for chronic, carcinogens and non-carcinogens.
  - b. Generally, use depth of outfall at MLLW (marine environment).
  - c. Use density profile that gives the lowest dilution. Evaluate both maximum and minimum stratification. For human health, use average density profiles to estimate dilution.
  - d. For unidirectional flow use centerline dilution factor for acute and chronic conditions, while flux average for human health dilution factors. For marine environment or rivers with reversing flows, use flux-average dilution factors for all conditions.
5. Diffuser information:
  - a. Location, orientation, description and dimension of diffusers and ports.
  - b. Port elevation above bottom and the depth of the diffuser/port below water surface based on MLLW (for marine or tidally-influenced river reaches).
  - c. Plan view maps showing the mixing zone size and dimensions in relation to the diffuser.
  - d. Schematic of waterbody cross-section, showing channel width, depth, and diffuser location in relation to shoreline and bottom.
  - e. Report on the integrity of the diffuser and the ports being modeled.

6. Discharge characteristics:
  - a. Existing and projected maximum daily, maximum monthly average, and annual average flows.
  - b. Discharge density (temperature and salinity).
7. Ambient water characteristics:
  - a. Critical stream flow statistics marine current velocities (10th, 90th and 50th percentiles over a neap and spring tide and directions).
  - b. Velocity profile in the vicinity of the diffuser.
  - c. Temporal density (temperature and salinity) profiles near the diffuser. May need to consider both seasonal and tidal variability.
  - d. Manning's roughness coefficient, if used.
  - e. Available information regarding background concentrations of chemical substances in the receiving water for which there are criteria in chapter 173-201A WAC.
8. Model selection and results:
  - a. Model selection and application discussion. Consider model applicability to single or multipoint diffuser, opposing port configuration, submerged, surface or above-surface discharge, buoyant or non-buoyant discharge, and potential plume attachment to boundaries.
  - b. Description of mixing and plume dynamics (nearfield, farfield, tidal buildup/reflux).
  - c. Sensitivity analysis.
  - d. Calibration to empirical data (tracer studies), if applicable.
  - e. Provide model output and summary table of results.

C. Protocols

The Permittee must determine the dilution ratio using protocols outlined in the following references, approved modifications thereof, or by another method approved by Ecology:

1. Doneker, R.L. and G.H. Jirka, *CORMIX User Manual: A Hydrodynamic Mixing Zone Model and Decision Support System for Pollutant Discharges into Surface Waters*, EPA-823-K-07-001, Dec. 2007. <http://www.mixzon.com/downloads/>.

A complete list of general reference for CORMIX is at:  
<http://www.cormix.info/references.php>

2. Frick, W.E., Roberts, P.J.W., Davis, L.R., Keyes, D.J., Baumgartner, George, K.P. 2003. *Dilution Models for Effluent Discharges, 4th Edition (Visual Plumes)*. Ecosystems Research Div., USEPA, Athens, GA, USA.
3. Ecology, Water Quality Program, *Permit Writer's Manual*. 2015. Washington State Department of Ecology. Publication No. 92-109, Revised January 2015. <https://fortress.wa.gov/ecy/publications/documents/92109.pdf>.
4. Ecology, Guidance for conducting mixing zone analysis (Appendix C, Water Quality Program *Permit Writer's Manual*. 2015). <https://fortress.wa.gov/ecy/publications/parts/92109part1.pdf>.
5. Kilpatrick, F.A., and E.D. Cobb, *Measurement of Discharge Using Tracers, Chapter A16, Techniques of Water-Resources Investigations of the USGS*, Book 3, Application of Hydraulics, USGS, U.S. Department of the Interior, Reston, VA, 1985.
6. Wilson, J.F., E.D. Cobb, and F.A. Kilpatrick, *Fluorometric Procedures for Dye Tracing, Chapter A12. Techniques of Water-Resources Investigations of the USGS*, Book 3, Application of Hydraulics, USGS, U.S. Department of the Interior, Reston, VA, 1986.

#### S10. OUTFALL EVALUATION

The Permittee must inspect, 1/permit cycle, the submerged portion of the outfall line and diffuser to document its integrity and continued function. Submit the outfall condition assessment with the permit renewal application **by July 1, 2023**.

The inspector must at minimum:

- Assess the physical condition of the outfall pipe, diffuser, and associated couplings.
- Determine the extent of sediment accumulation in the vicinity of the diffuser.
- Ensure diffuser ports are free of obstructions and are allowing uniform flow.
- Confirm physical location (latitude/longitude) and depth (at MLLW) of the diffuser section of the outfall.
- Assess physical condition of the submarine line.
- Assess physical condition of anchors used to secure the submarine line.

#### S11. CERTIFIED OPERATOR

This permitted facility must be operated by an operator certified by the state of Washington for at least a Class II plant. This operator must be in responsible charge of the day-to-day operation of the wastewater treatment plant. An operator certified for at least a Class II plant must be in charge during all regularly scheduled shifts.

## GENERAL CONDITIONS

### G1. SIGNATORY REQUIREMENTS

- A. All applications submitted to Ecology must be signed and certified.
1. In the case of corporations, by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:
    - A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation, or
    - The manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
  2. In the case of a partnership, by a general partner.
  3. In the case of sole proprietorship, by the proprietor.
  4. In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official.

Applications for permits for domestic wastewater facilities that are either owned or operated by, or under contract to, a public entity shall be submitted by the public entity.

- B. All reports required by this permit and other information requested by Ecology must be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
1. The authorization is made in writing by a person described above and submitted to Ecology.
  2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)
- C. Changes to authorization. If an authorization under paragraph G1.B, above, is no longer accurate because a different individual or position has responsibility for the overall

operation of the facility, a new authorization satisfying the requirements of paragraph G1.B, above, must be submitted to Ecology prior to or together with any reports, information, or applications to be signed by an authorized representative.

- D. Certification. Any person signing a document under this section must make the following certification:

“I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

## G2. RIGHT OF INSPECTION AND ENTRY

The Permittee must allow an authorized representative of Ecology, upon the presentation of credentials and such other documents as may be required by law:

- A. To enter upon the premises where a discharge is located or where any records must be kept under the terms and conditions of this permit.
- B. To have access to and copy, at reasonable times and at reasonable cost, any records required to be kept under the terms and conditions of this permit.
- C. To inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, methods, or operations regulated or required under this permit.
- D. To sample or monitor, at reasonable times, any substances or parameters at any location for purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act.

## G3. PERMIT ACTIONS

This permit may be modified, revoked and reissued, or terminated either at the request of any interested person (including the permittee) or upon Ecology's initiative. However, the permit may only be modified, revoked and reissued, or terminated for the reasons specified in 40 CFR 122.62, 122.64 or WAC 173-220-150 according to the procedures of 40 CFR 124.5.

- A. The following are causes for terminating this permit during its term, or for denying a permit renewal application:
  - 1. Violation of any permit term or condition.
  - 2. Obtaining a permit by misrepresentation or failure to disclose all relevant facts.
  - 3. A material change in quantity or type of waste disposal.

4. A determination that the permitted activity endangers human health or the environment, or contributes to water quality standards violations and can only be regulated to acceptable levels by permit modification or termination.
  5. A change in any condition that requires either a temporary or permanent reduction, or elimination of any discharge or sludge use or disposal practice controlled by the permit.
  6. Nonpayment of fees assessed pursuant to RCW 90.48.465.
  7. Failure or refusal of the Permittee to allow entry as required in RCW 90.48.090.
- B. The following are causes for modification but not revocation and reissuance except when the Permittee requests or agrees:
1. A material change in the condition of the waters of the state.
  2. New information not available at the time of permit issuance that would have justified the application of different permit conditions.
  3. Material and substantial alterations or additions to the permitted facility or activities which occurred after this permit issuance.
  4. Promulgation of new or amended standards or regulations having a direct bearing upon permit conditions, or requiring permit revision.
  5. The Permittee has requested a modification based on other rationale meeting the criteria of 40 CFR Part 122.62.
  6. Ecology has determined that good cause exists for modification of a compliance schedule, and the modification will not violate statutory deadlines.
  7. Incorporation of an approved local pretreatment program into a municipality's permit.
- C. The following are causes for modification or alternatively revocation and reissuance:
1. When cause exists for termination for reasons listed in A.1 through A.7 of this section, and Ecology determines that modification or revocation and reissuance is appropriate.
  2. When Ecology has received notification of a proposed transfer of the permit. A permit may also be modified to reflect a transfer after the effective date of an automatic transfer (General Condition G7) but will not be revoked and reissued after the effective date of the transfer except upon the request of the new Permittee.

#### G4. REPORTING PLANNED CHANGES

The Permittee must, as soon as possible, but no later than 180 days prior to the proposed changes, give notice to Ecology of planned physical alterations or additions to the permitted facility, production increases, or process modification which will result in:

- A. The permitted facility being determined to be a new source pursuant to 40 CFR 122.29(b).
- B. A significant change in the nature or an increase in quantity of pollutants discharged.
- C. A significant change in the Permittee's sludge use or disposal practices. Following such notice, and the submittal of a new application or supplement to the existing application, along with required engineering plans and reports, this permit may be modified, or revoked and reissued pursuant to 40 CFR 122.62(a) to specify and limit any pollutants not previously limited. Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by this permit constitutes a violation.

G5. PLAN REVIEW REQUIRED

Prior to constructing or modifying any wastewater control facilities, an engineering report and detailed plans and specifications must be submitted to Ecology for approval in accordance with chapter 173-240 WAC. Engineering reports, plans, and specifications must be submitted at least 180 days prior to the planned start of construction unless a shorter time is approved by Ecology. Facilities must be constructed and operated in accordance with the approved plans.

G6. COMPLIANCE WITH OTHER LAWS AND STATUTES

Nothing in this permit excuses the Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

G7. TRANSFER OF THIS PERMIT

In the event of any change in control or ownership of facilities from which the authorized discharge emanate, the Permittee must notify the succeeding owner or controller of the existence of this permit by letter, a copy of which must be forwarded to Ecology.

A. Transfers by Modification

Except as provided in paragraph (B) below, this permit may be transferred by the Permittee to a new owner or operator only if this permit has been modified or revoked and reissued under 40 CFR 122.62(b)(2), or a minor modification made under 40 CFR 122.63(d), to identify the new Permittee and incorporate such other requirements as may be necessary under the Clean Water Act.

B. Automatic Transfers

This permit may be automatically transferred to a new Permittee if:

1. The Permittee notifies Ecology at least 30 days in advance of the proposed transfer date.
2. The notice includes a written agreement between the existing and new Permittees containing a specific date transfer of permit responsibility, coverage, and liability between them.
3. Ecology does not notify the existing Permittee and the proposed new Permittee of its intent to modify or revoke and reissue this permit. A modification under this

subparagraph may also be minor modification under 40 CFR 122.63. If this notice is not received, the transfer is effective on the date specified in the written agreement.

G8. Reduced Production For Compliance

The Permittee, in order to maintain compliance with its permit, must control production and/or all discharges upon reduction, loss, failure, or bypass of the treatment facility until the facility is restored or an alternative method of treatment is provided. This requirement applies in the situation where, among other things, the primary source of power of the treatment facility is reduced, lost, or fails.

G9. Removed Substances

Collected screenings, grit, solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters must not be resuspended or reintroduced to the final effluent stream for discharge to state waters.

G10. DUTY TO PROVIDE INFORMATION

The Permittee must submit to Ecology, within a reasonable time, all information which Ecology may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Permittee must also submit to Ecology upon request, copies of records required to be kept by this permit.

G11. OTHER REQUIREMENTS OF 40 CFR

All other requirements of 40 CFR 122.41 and 122.42 are incorporated in this permit by reference.

G12. ADDITIONAL MONITORING

Ecology may establish specific monitoring requirements in addition to those contained in this permit by administrative order or permit modification.

G13. PAYMENT OF FEES

The Permittee must submit payment of fees associated with this permit as assessed by Ecology.

G14. PENALTIES FOR VIOLATING PERMIT CONDITIONS

Any person who is found guilty of willfully violating the terms and conditions of this permit is deemed guilty of a crime, and upon conviction thereof shall be punished by a fine of up to \$10,000 and costs of prosecution, or by imprisonment in the discretion of the court. Each day upon which a willful violation occurs may be deemed a separate and additional violation.

Any person who violates the terms and conditions of a waste discharge permit may incur, in addition to any other penalty as provided by law, a civil penalty in the amount of up to \$10,000 for every such violation. Each and every such violation is a separate and distinct offense, and in case of a continuing violation, every day's continuance is deemed to be a separate and distinct violation.

G15. UPSET

Definition – “Upset” means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limits if the requirements of the following paragraph are met.

A Permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

- A. An upset occurred and that the Permittee can identify the cause(s) of the upset.
- B. The permitted facility was being properly operated at the time of the upset.
- C. The Permittee submitted notice of the upset as required in Special Condition S3.F.
- D. The Permittee complied with any remedial measures required under S3.F of this permit.

In any enforcement action the Permittee seeking to establish the occurrence of an upset has the burden of proof.

G16. PROPERTY RIGHTS

This permit does not convey any property rights of any sort, or any exclusive privilege.

G17. DUTY TO COMPLY

The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

G18. TOXIC POLLUTANTS

The Permittee must comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.

G19. PENALTIES FOR TAMPERING

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than two years per violation, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this condition, punishment shall be a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than four years, or by both.

G20. REPORTING REQUIREMENTS APPLICABLE TO EXISTING MANUFACTURING, COMMERCIAL, MINING, AND SILVICULTURAL DISCHARGERS

The Permittee belonging to the categories of existing manufacturing, commercial, mining, or silviculture must notify Ecology as soon as they know or have reason to believe:

- A. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following "notification levels:"
1. One hundred micrograms per liter (100 µg/L).
  2. Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony.
  3. Five times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7).
  4. The level established by the Director in accordance with 40 CFR 122.44(f).
- B. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following "notification levels:"
1. Five hundred micrograms per liter (500µg/L).
  2. One milligram per liter (1 mg/L) for antimony.
  3. Ten times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7).
  4. The level established by the Director in accordance with 40 CFR 122.44(f).

G21. COMPLIANCE SCHEDULES

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date.

## APPENDIX A

### *LIST OF POLLUTANTS WITH ANALYTICAL METHODS, DETECTION LIMITS AND QUANTITATION LEVELS*

The Permittee must use the specified analytical methods, detection limits (DLs) and quantitation levels (QLs) in the following table for permit and application required monitoring unless:

- Another permit condition specifies other methods, detection levels, or quantitation levels.
- The method used produces measurable results in the sample and EPA has listed it as an EPA-approved method in 40 CFR Part 136.

If the Permittee uses an alternative method, not specified in the permit and as allowed above, it must report the test method, DL, and QL on the discharge monitoring report or in the required report.

If the Permittee is unable to obtain the required DL and QL in its effluent due to matrix effects, the Permittee must submit a matrix-specific detection limit (MDL) and a quantitation limit (QL) to Ecology with appropriate laboratory documentation.

When the permit requires the Permittee to measure the base neutral compounds in the list of priority pollutants, it must measure all of the base neutral pollutants listed in the table below. The list includes EPA required base neutral priority pollutants and several additional polynuclear aromatic hydrocarbons (PAHs). The Water Quality Program added several PAHs to the list of base neutrals below from Ecology's Persistent Bioaccumulative Toxics (PBT) List. It only added those PBT parameters of interest to Appendix A that did not increase the overall cost of analysis unreasonably.

Ecology added this appendix to the permit in order to reduce the number of analytical "non-detects" in permit-required monitoring and to measure effluent concentrations near or below criteria values where possible at a reasonable cost.

The lists below include conventional pollutants (as defined in CWA section 502(6) and 40 CFR Part 122.), toxic or priority pollutants as defined in CWA section 307(a)(1) and listed in 40 CFR Part 122 Appendix D, 40 CFR Part 401.15 and 40 CFR Part 423 Appendix A), and nonconventionals. 40 CFR Part 122 Appendix D (Table V) also identifies toxic pollutants and hazardous substances which are required to be reported by dischargers if expected to be present. This permit appendix A list does not include those parameters.

**CONVENTIONAL POLLUTANTS**

Pollutant	CAS Number (if available)	Recommended Analytical Protocol	Detection (DL) <sup>1</sup> µg/L unless specified	Quantitation Level (QL) <sup>2</sup> µg/L unless specified
Biochemical Oxygen Demand		SM5210-B		2 mg/L
Biochemical Oxygen Demand, Soluble		SM5210-B <sup>3</sup> SM 9221E,9222	N/A	2 mg/L Specified in method - sample aliquot dependent
Fecal Coliform		1664 A or B	1,400	5,000
Oil and Grease (HEM) (Hexane Extractable Material)		SM4500-H <sup>4</sup> B	N/A	N/A
pH		SM2540-D		5 mg/L
Total Suspended Solids				

**NONCONVENTIONAL POLLUTANTS**

Pollutant & CAS No. (if available)	CAS Number (if available)	Recommended Analytical Protocol	Detection (DL) <sup>1</sup> µg/L unless specified	Quantitation Level (QL) <sup>2</sup> µg/L unless specified
Alkalinity, Total		SM2320-B		5 mg/L as CaCO <sub>3</sub>
Aluminum, Total	7429-90-5	200.8	2.0	10
Ammonia, Total (as N)		SM4500-NH <sub>3</sub> -B and C/D/E/G/H		20
Barium Total	7440-39-3	200.8	0.5	2.0
BTEX (benzene +toluene + ethylbenzene + m,o,p xylenes)		EPA SW 846 8021/8260	1	2
Boron, Total	7440-42-8	200.8	2.0	10.0
Chemical Oxygen Demand		SM5220-D		10 mg/L
Chloride		SM4500-Cl B/C/D/E and SM4110 B		Sample and limit dependent
Chlorine, Total Residual		SM4500 Cl G		50.0
Cobalt, Total	7440-48-4	200.8	0.05	0.25

**NONCONVENTIONAL POLLUTANTS**

Pollutant & CAS No. (if available)	CAS Number (if available)	Recommended Analytical Protocol	Detection (DL) <sup>1</sup> µg/L unless specified	Quantitation Level (QL) <sup>2</sup> µg/L unless specified
Color		SM2120 B/C/E		10 color units
Dissolved oxygen		SM4500-OC/OG		0.2 mg/L
Fluoride	16984-48-8	Calibrated device SM4500-F E SM2340B	25	100
Hardness, Total				200 as CaCO <sub>3</sub>
Iron, Total	7439-89-6	200.7	12.5	50
Magnesium, Total	7439-95-4	200.7	10	50
Manganese, Total	7439-96-5	200.8	0.1	0.5
Molybdenum, Total	7439-98-7	200.8	0.1	0.5
Nitrate + Nitrite Nitrogen (as N)		SM4500-NO <sub>3</sub> - E/F/H		100
Nitrogen, Total Kjeldahl (as N)		SM4500-N <sub>org</sub> B/C and SM4500NH <sub>3</sub> - B/C/D/EE/G/H		300
NWTPH Dx <sup>4</sup>		Ecology NWTPH Dx	250	250
NWTPH Gx <sup>5</sup>		Ecology NWTPH Gx	250	250
Phosphorus, Total (as P)		SM 4500 PB followed by SM4500-PE/PF SM2520-B	3	10
Salinity				3 practical salinity units or scale (PSU or PSS)
Settleable Solids		SM2540 -F		Sample and limit dependent
Soluble Reactive Phosphorus (as P)		SM4500-P E/F/G	3	10
Sulfate (as mg/L SO <sub>4</sub> )		SM4110-B		0.2 mg/L
Sulfide (as mg/L S)		SM4500-S <sup>2</sup> F/D/E/G		0.2 mg/L
Sulfite (as mg/L SO <sub>3</sub> )		SM4500-SO3B		2 mg/L
Temperature (max. 7-day avg.)		Analog recorder or Use micro-recording devices known as thermistors		0.2° C

**NONCONVENTIONAL POLLUTANTS**

Pollutant & CAS No. (if available)	CAS Number (if available)	Recommended Analytical Protocol	Detection (DL) <sup>1</sup> µg/L unless specified	Quantitation Level (QL) <sup>2</sup> µg/L unless specified
Tin, Total	7440-31-5	200.8	0.3	1.5
Titanium, Total	7440-32-6	200.8	0.5	2.5
Total Coliform		SM 9221B, 9222B, 9223B	N/A	Specified in method - sample aliquot dependent
Total Organic Carbon		SM5310-B/C/D		1 mg/L
Total dissolved solids		SM2540 C		20 mg/L

**PRIORITY POLLUTANTS**

Pollutant & CAS No. (if available)	CAS Number (if available)	Recommended Analytical Protocol	Detection (DL) <sup>1</sup> µg/L unless specified	Quantitation Level (QL) <sup>2</sup> µg/L unless specified	
	PP #	CAS Number (if available)	Recommended Analytical Protocol	Detection (DL) <sup>1</sup> µg/L unless specified	Quantitation Level (QL) <sup>2</sup> µg/L unless specified

**METALS, CYANIDE & TOTAL PHENOLS**

Antimony, Total	114	7440-36-0	200.8	0.3	1.0
Arsenic, Total	115	7440-38-2	200.8	0.1	0.5
Beryllium, Total	117	7440-41-7	200.8	0.1	0.5
Cadmium, Total	118	7440-43-9	200.8	0.05	0.25
Chromium (hex) dissolved	119	18540-29-9	SM3500-Cr C	0.3	1.2
Chromium, Total	119	7440-47-3	200.8	0.2	1.0
Copper, Total	120	7440-50-8	200.8	0.4	2.0
Lead, Total	122	7439-92-1	200.8	0.1	0.5
Mercury, Total	123	7439-97-6	1631E	0.0002	0.0005
Nickel, Total	124	7440-02-0	200.8	0.1	0.5
Selenium, Total	125	7782-49-2	200.8	1.0	1.0
Silver, Total	126	7440-22-4	200.8	0.04	0.2
Thallium, Total	127	7440-28-0	200.8	0.09	0.36
Zinc, Total	128	7440-66-6	200.8	0.5	2.5
Cyanide, Total	121	57-12-5	335.4	5	10
Cyanide, Weak Acid Dissociable	121		SM4500-CNI	5	10

**NONCONVENTIONAL POLLUTANTS**

Pollutant & CAS No. (if available)	CAS Number (if available)	Recommended Analytical Protocol	Detection (DL) <sup>1</sup> µg/L unless specified	Quantitation Level (QL) <sup>2</sup> µg/L unless specified	
Cyanide, Free Amenable to Chlorination (Available Cyanide)	121	SM4500-CN G	5	10	
Phenols, Total	65	EPA 420.1		50	
<b>PRIORITY POLLUTANTS</b>					
	PP #	CAS Number (if available)	Recommended Analytical Protocol	Detection (DL) <sup>1</sup> µg/L unless specified	Quantitation Level (QL) <sup>2</sup> µg/L unless specified
<b>ACID COMPOUNDS</b>					
2-Chlorophenol	24	95-57-8	625.1	3.3	9.9
2,4-Dichlorophenol	31	120-83-2	625.1	2.7	8.1
2,4-Dimethylphenol	34	105-67-9	625.1	2.7	8.1
4,6-dinitro-o-cresol (2-methyl-4,6-dinitrophenol)	60	534-52-1	625.1/1625B	24	72
2,4 dinitrophenol	59	51-28-5	625.1	42	126
2-Nitrophenol	57	88-75-5	625.1	3.6	10.8
4-Nitrophenol	58	100-02-7	625.1	2.4	7.2
Parachlorometa cresol (4-chloro-3-methylphenol)	22	59-50-7	625.1	3.0	9.0
Pentachlorophenol	64	87-86-5	625.1	3.6	10.8
Phenol	65	108-95-2	625.1	1.5	4.5
2,4,6-Trichlorophenol	21	88-06-2	625.1	2.7	8.1
<b>PRIORITY POLLUTANTS</b>					
	PP #	CAS Number (if available)	Recommended Analytical Protocol	Detection (DL) <sup>1</sup> µg/L unless specified	Quantitation Level (QL) <sup>2</sup> µg/L unless specified
<b>VOLATILE COMPOUNDS</b>					
Acrolein	2	107-02-8	624	5	10
Acrylonitrile	3	107-13-1	624	1.0	2.0

**NONCONVENTIONAL POLLUTANTS**

Pollutant & CAS No. (if available)	CAS Number (if available)	Recommended Analytical Protocol	Detection (DL) <sup>1</sup> µg/L unless specified	Quantitation Level (QL) <sup>2</sup> µg/L unless specified
Benzene	4	71-43-2	624.1	4.4
Bromoform	47	75-25-2	624.1	4.7
Carbon tetrachloride	6	56-23-5	624.1/601 or SM6230B	2.8
Chlorobenzene	7	108-90-7	624.1	6.0
Chloroethane	16	75-00-3	624/601	1.0
2-Chloroethylvinyl Ether	19	110-75-8	624	1.0
Chloroform	23	67-66-3	624.1 or SM6210B	1.6
Dibromochloromethane (chloridibromomethane)	51	124-48-1	624.1	3.1
1,2-Dichlorobenzene	25	95-50-1	624	1.9
1,3-Dichlorobenzene	26	541-73-1	624	1.9
1,4-Dichlorobenzene	27	106-46-7	624	4.4
Dichlorobromomethane	48	75-27-4	624.1	2.2
1,1-Dichloroethane	13	75-34-3	624.1	4.7
1,2-Dichloroethane	10	107-06-2	624.1	2.8
1,1-Dichloroethylene	29	75-35-4	624.1	2.8
1,2-Dichloropropane	32	78-87-5	624.1	6.0
1,3-dichloropropene (mixed isomers) (1,2-dichloropropylene) <sup>6</sup>	33	542-75-6	624.1	5.0
Ethylbenzene	38	100-41-4	624.1	7.2
Methyl bromide (Bromomethane)	46	74-83-9	624/601	5.0
Methyl chloride (Chloromethane)	45	74-87-3	624	1.0
Methylene chloride	44	75-09-2	624.1	2.8
1,1,2,2-Tetrachloroethane	15	79-34-5	624.1	6.9
Tetrachloroethylene	85	127-18-4	624.1	4.1
Toluene	86	108-88-3	624.1	6.0
1,2-Trans-Dichloroethylene (Ethylene dichloride)	30	156-60-5	624.1	1.6
				4.8

**NONCONVENTIONAL POLLUTANTS**

Pollutant & CAS No. (if available)	CAS Number (if available)	Recommended Analytical Protocol	Detection (DL) <sup>1</sup> µg/L unless specified	Quantitation Level (QL) <sup>2</sup> µg/L unless specified	
1,1,1-Trichloroethane	11	71-55-6	624.1	3.8	
1,1,2-Trichloroethane	14	79-00-5	624.1	5.0	
Trichloroethylene	87	79-01-6	624.1	1.9	
Vinyl chloride	88	75-01-4	624/SM6200B	1.0	
<b>PRIORITY POLLUTANTS</b>	PP #	CAS Number (if available)	Recommended Analytical Protocol	Detection (DL) <sup>1</sup> µg/L unless specified	Quantitation Level (QL) <sup>2</sup> µg/L unless specified
<b>BASE/NEUTRAL COMPOUNDS (compounds in bold are Ecology PBTs)</b>					
Acenaphthene	1	83-32-9	625.1	1.9	5.7
Acenaphthylene	77	208-96-8	625.1	3.5	10.5
Anthracene	78	120-12-7	625.1	1.9	5.7
Benzidine	5	92-87-5	625.1	44	132
Benzyl butyl phthalate	67	85-68-7	625.1	2.5	7.5
Benzo(a)anthracene	72	56-55-3	625.1	7.8	23.4
Benzo(b)fluoranthene (3,4-benzofluoranthene) <sup>7</sup>	74	205-99-2	610/625.1	4.8	14.4
<b>Benzo(j)fluoranthene<sup>7</sup></b>		<b>205-82-3</b>	625	0.5	1.0
Benzo(k)fluoranthene (11,12-benzofluoranthene) <sup>7</sup>	75	207-08-9	610/625.1	2.5	7.5
<b>Benzo(r,s,t)pentaphene</b>		<b>189-55-9</b>	625	1.3	5.0
Benzo(a)pyrene	73	50-32-8	610/625.1	2.5	7.5
Benzo(ghi)perylene	79	191-24-2	610/625.1	4.1	12.3
Bis(2-chloroethoxy)methane	43	111-91-1	625.1	5.3	15.9
Bis(2-chloroethyl)ether	18	111-44-4	611/625.1	5.7	17.1
Bis(2-chloroisopropyl)ether	42	39638-32-9	625	0.5	1.0
Bis(2-ethylhexyl)phthalate	66	117-81-7	625.1	2.5	7.5
4-Bromophenyl phenyl ether	41	101-55-3	625.1	1.9	5.7

**NONCONVENTIONAL POLLUTANTS**

Pollutant & CAS No. (if available)	CAS Number (if available)	Recommended Analytical Protocol	Detection (DL) <sup>1</sup> µg/L unless specified	Quantitation Level (QL) <sup>2</sup> µg/L unless specified	
2-Chloronaphthalene	20	91-58-7	625.1	1.9	5.7
4-Chlorophenyl phenyl ether	40	7005-72-3	625.1	4.2	12.6
Chrysene	76	218-01-9	610/625.1	2.5	7.5
<b>Dibenzo (a,h)acridine</b>		<b>226-36-8</b>	<b>610M/625M</b>	<b>2.5</b>	<b>10.0</b>
<b>Dibenzo (a,j)acridine</b>		<b>224-42-0</b>	<b>610M/625M</b>	<b>2.5</b>	<b>10.0</b>
Dibenzo(a-h)anthracene (1,2,5,6-dibenzanthracene)	82	53-70-3	625.1	2.5	7.5
<b>Dibenzo(a,e)pyrene</b>		<b>192-65-4</b>	<b>610M/625M</b>	<b>2.5</b>	<b>10.0</b>
<b>Dibenzo(a,h)pyrene</b>		<b>189-64-0</b>	<b>625M</b>	<b>2.5</b>	<b>10.0</b>
3,3-Dichlorobenzidine	28	91-94-1	605/625.1	16.5	49.5
Diethyl phthalate	70	84-66-2	625.1	1.9	5.7
Dimethyl phthalate	71	131-11-3	625.1	1.6	4.8
Di-n-butyl phthalate	68	84-74-2	625.1	2.5	7.5
2,4-dinitrotoluene	35	121-14-2	609/625.1	5.7	17.1
2,6-dinitrotoluene	36	606-20-2	609/625.1	1.9	5.7
Di-n-octyl phthalate	69	117-84-0	625.1	2.5	7.5
1,2-Diphenylhydrazine ( <i>as Azobenzene</i> )	37	122-66-7	1625B	5.0	20
Fluoranthene	39	206-44-0	625.1	2.2	6.6
Fluorene	80	86-73-7	625.1	1.9	5.7
Hexachlorobenzene	9	118-74-1	612/625.1	1.9	5.7
Hexachlorobutadiene	52	87-68-3	625.1	0.9	2.7
Hexachlorocyclopentadiene	53	77-47-4	1625B/625	2.0	4.0
Hexachloroethane	12	67-72-1	625.1	1.6	4.8
Indeno(1,2,3- <i>cd</i> )Pyrene	83	193-39-5	610/625.1	3.7	11.1
Isophorone	54	78-59-1	625.1	2.2	6.6
<b>3-Methyl cholanthrene</b>		<b>56-49-5</b>	<b>625</b>	<b>2.0</b>	<b>8.0</b>
Naphthalene	55	91-20-3	625.1	1.6	4.8
Nitrobenzene	56	98-95-3	625.1	1.9	5.7
N-Nitrosodimethylamine	61	62-75-9	607/625	2.0	4.0

**NONCONVENTIONAL POLLUTANTS**

Pollutant & CAS No. (if available)	CAS Number (if available)	Recommended Analytical Protocol	Detection (DL) <sup>1</sup> µg/L unless specified	Quantitation Level (QL) <sup>2</sup> µg/L unless specified
N-Nitrosodi-n-propylamine	63	607/625	0.5	1.0
N-Nitrosodiphenylamine	62	625	1.0	2.0
<b>Perylene</b>	<b>198-55-0</b>	625	1.9	7.6
Phenanthrene	81	625.1	5.4	16.2
Pyrene	84	625.1	1.9	5.7
1,2,4-Trichlorobenzene	8	625.1	1.9	5.7
<b>PRIORITY POLLUTANT</b>	<b>PP #</b>	<b>Recommended Analytical Protocol</b>	<b>Detection (DL)<sup>1</sup> µg/L unless specified</b>	<b>Quantitation Level (QL)<sup>2</sup> µg/L unless specified</b>
<b>DIOXIN</b>				
2,3,7,8-Tetra-Chlorodibenzo-P-Dioxin (2,3,7,8 TCDD)	129	1613B	1.3 pg/L	5 pg/L
<b>PRIORITY POLLUTANTS</b>	<b>PP #</b>	<b>Recommended Analytical Protocol</b>	<b>Detection (DL)<sup>1</sup> µg/L unless specified</b>	<b>Quantitation Level (QL)<sup>2</sup> µg/L unless specified</b>
<b>PESTICIDES/PCBs</b>				
Aldrin	89	608.3	4.0 ng/L	12 ng/L
alpha-BHC	102	608.3	3.0 ng/L	9.0 ng/L
beta-BHC	103	608.3	6.0 ng/L	18 ng/L
gamma-BHC (Lindane)	104	608.3	4.0 ng/L	12 ng/L
delta-BHC	105	608.3	9.0 ng/L	27 ng/L
Chlordane <sup>8</sup>	91	608.3	14 ng/L	42 ng/L
4,4'-DDT	92	608.3	12 ng/L	36 ng/L
4,4'-DDE	93	608.3	4.0 ng/L	12 ng/L
4,4' DDD	94	608.3	11ng/L	33 ng/L
Dieldrin	90	608.3	2.0 ng/L	6.0 ng/L
alpha-Endosulfan	95	608.3	14 ng/L	42 ng/L

**NONCONVENTIONAL POLLUTANTS**

Pollutant & CAS No. (if available)	CAS Number (if available)	Recommended Analytical Protocol	Detection (DL) <sup>1</sup> µg/L unless specified	Quantitation Level (QL) <sup>2</sup> µg/L unless specified
beta-Endosulfan	96	33213-65-9	608.3	4.0 ng/L
Endosulfan Sulfate	97	1031-07-8	608.3	12 ng/L
Endrin	98	72-20-8	608.3	198 ng/L
Endrin Aldehyde	99	7421-93-4	608.3	6.0 ng/L
Heptachlor	100	76-44-8	608.3	23 ng/L
Heptachlor Epoxide	101	1024-57-3	608.3	3.0 ng/L
PCB-1242 <sup>9</sup>	106	53469-21-9	608.3	83 ng/L
PCB-1254	107	11097-69-1	608.3	0.065
PCB-1221	108	11104-28-2	608.3	0.065
PCB-1232	109	11141-16-5	608.3	0.065
PCB-1248	110	12672-29-6	608.3	0.065
PCB-1260	111	11096-82-5	608.3	0.065
PCB-1016 <sup>9</sup>	112	12674-11-2	608.3	0.065
Toxaphene	113	8001-35-2	608.3	240 ng/L

1. Detection level (DL) or detection limit means the minimum concentration of an analyte (substance) that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero as determined by the procedure given in 40 CFR part 136, Appendix B.
2. Quantitation Level (QL) also known as Minimum Level of Quantitation (ML) – The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that the lab has used all method-specified sample weights, volumes, and cleanup procedures. The QL is calculated by multiplying the MDL by 3.18 and rounding the result to the number nearest to (1, 2, or 5) x 10<sup>n</sup>, where n is an integer. (64 FR 30417).  
 ALSO GIVEN AS:  
 The smallest detectable concentration of analyte greater than the Detection Limit (DL) where the accuracy (precision & bias) achieves the objectives of the intended purpose. (Report of the Federal Advisory Committee on Detection and Quantitation Approaches and Uses in Clean Water Act Programs Submitted to the US Environmental Protection Agency December 2007).

3. Soluble Biochemical Oxygen Demand method note: First, filter the sample through a Millipore Nylon filter (or equivalent) - pore size of 0.45-0.50 um (prep all filters by filtering 250 ml of laboratory grade deionized water through the filter and discard). Then, analyze sample as per method 5210-B.
4. NWTPH Dx - Northwest Total Petroleum Hydrocarbons Diesel Extended Range - see <https://fortress.wa.gov/ecy/publications/documents/97602.pdf>
5. NWTPH Gx - Northwest Total Petroleum Hydrocarbons Gasoline Extended Range - see <https://fortress.wa.gov/ecy/publications/documents/97602.pdf>
6. 1, 3-dichloropropylene (mixed isomers) You may report this parameter as two separate parameters: cis-1, 3-dichloropropene (10061-01-5) and trans-1, 3-dichloropropene (10061-02-6).
7. Total Benzofluoranthenes - Because Benzo(b)fluoranthene, Benzo(j)fluoranthene and Benzo(k)fluoranthene co-elute you may report these three isomers as total benzofluoranthenes.
8. Chlordane - You may report alpha-chlordane (5103-71-9) and gamma-chlordane (5103-74-2) in place of chlordane (57-74-9). If you report alpha and gamma-chlordane, the DL/PQLs that apply are 14/42 ng/L.
9. PCB 1016 & PCB 1242 - You may report these two PCB compounds as one parameter called PCB 1016/1242.

