**ENVIRONMENTAL COMPLIANCE PROGRAM**

**I. Policy:**

Many activities and services have the potential to cause impacts on the environment. As a key determinant to sustainable development the Environmental Compliance Program (ECP) is established to aid in the development of policies, programs and practices through which operations can be conducted in an environmentally sound manner.

Management will integrate these policies, programs and practices fully into each affected department/division as an essential element of its function.

Continuous improvement can only be achieved through the Counties commitment in the review and corrective actions process required of the policies, programs, and practices as indicated by operational procedures and needs.

Prior to the planning, construction, procurement or donation of a site, structure or facility an assessment of any environmental impacts will be made.

Orange County will continue to develop, design and operate facilities and conduct activities that take into account the efficient use of energy and materials, the sustainable use of renewable resources, the minimization of adverse environmental impacts and the generation of waste.

Orange County will develop and maintain emergency prevention plans, contingencies, pollution prevention plans that take into account and recognize the many county interests and potential impacts on the environment.

Orange County will educate, train and motivate employees to conduct their activities in an environmentally responsible manner.

Orange County will foster openness and dialogue with employees and the public, anticipating their concerns about potential hazards and impacts of operations, wastes or services.

Through the adoption and promotion of these principles employees, consultants and contractors are encouraged to be good stewards of the environment and to achieve practices that are at least as consistent with those of Orange County.

**II. Purpose:**

The purpose of this program is to provide guidance to departments and divisions on the handling, identification, labeling, storage, purchasing, prevention techniques and clean up of hazardous materials/wastes. This program is also directed towards the protection of our employees, the natural resources and our community.

**III. Criteria:**

Organization, management, efficiency, safety and information that is consistent with the best management practices for an organization like our own.

**IV. References:**

29 CFR, 40 CFR, NFPA 30, 49 CFR

**V. Organization & Responsibilities:**

Risk Management – Risk Management is involved in the identification, analysis and financing of risks.

Identification of asbestos, lead based paint (LBP), radon, environmental hazards, possible contamination, underground and aboveground tank replacement and containment are evaluated for potential losses or further losses. Property acquisitions, condemnations, donations, right-of-way and roadway expansion is reviewed for environmental hazards and potential liability. Environmental site assessments (Phase I and II), SAR (site assessment report), RAP (remedial action plan) and MOP (monitoring only plan) are monitored through Risk Management.

Asbestos and LBP surveys are conducted on all properties acquired or leased that have structures. Surveys and special precautions are taken for buildings built prior to 1978 (LBP is prevalent) and prior to 1981 (asbestos is common in building materials). Risk Management monitors any abatement and demolition of structures requiring adherence to section 112 of the Clean Air Act (CAA).

Orange County Environmental Protection Department – Investigates complaints and maintains files relating to air quality; surface water; ground water; the ecosystem management including aquatic plant control, NPDES and permitting; waste management including underground storage tanks, solid waste, waste tire, petroleum cleanup, industrial waste, hazardous waste and domestic waste. Provides laboratory services to monitor existing conditions in...
the county. Maintains a database of historical information that is available to citizens and other agencies. Reviews applications to build boat docks, ramps, spread sludge, construct wastewater treatment plants, lakeshore vegetation removal, dredge and fill and variances. EPD also inspects industrial sites and businesses that utilize and dispose of toxic chemicals. They also are tasked by the State with responding to spills within Orange County.

Manager and Director – Managers and Directors are responsible for ensuring compliance with all applicable federal, state, county and local rules, standards, regulations and laws. The manager and/or director will ensure that employees are familiar with all standards, rules and laws that are applicable to their operation. Managers and/or directors shall support environmental efforts; training and education of their employees cooperate with county departments/divisions that have as their responsibility the compliance and risk reduction of environmental issues.

Supervisor – Will ensure that all policies are fully implemented. Take the initiative in recommending corrective actions to environmental issues. Become familiar with applicable standards, rules, regulations and laws governing environmental issues. Fully cooperate with county departments/divisions that have as their responsibility the compliance and risk reduction of environmental issues.

Employee – Are required to follow all procedures, policies, programs and work practices. To comply with environmental rules and regulations, to maintain their training proficiency in the handling of materials and wastes safely and to fully cooperate with county departments/divisions that have as their responsibility the compliance and risk reduction of environmental issues.

VI. Definitions:

Absorption – The taking up of one substance into the body of another.

Acids – Compounds that contain hydrogen, have a sour taste when mixed with water, and cause purple litmus paper to turn red. Acids are hydrogen ion donors.

Adsorption – The condensation of gases, liquids or dissolved substances on the surfaces of solids.

Aliphatic Compounds – Contains all organic compounds which do not possess a benzene ring; and having a straight branched chain.

Aromatic Compounds – Contain a molecular structure consisting of one or more benzene rings.

Basic (alkaline) – Solutions which turn litmus paper blue, and have the ability to neutralize acids. A hydrogen ion acceptor.

Biomedical Waste – any solid or liquid waste which may present a threat of infection to humans, including nonliquid tissue, body parts, blood, blood products, and body fluids from humans and other primates; laboratory and veterinary wastes which contain human disease-causing agents; and discarded sharps. The following are also included:

- Used, absorbent materials saturated with blood, blood products, body fluids, or excretions or secretions contaminated with visible blood; and absorbent materials saturated with blood or blood products that have dried.
- Non-absorbent, disposable devices that have been contaminated with devices that have been contaminated with blood, body fluids, or secretions or excretions visibly contaminated with blood, but have not been treated by an approved method.

Body fluids – Those fluids which have the potential to harbor pathogens, such as human immunodeficiency virus and hepatitis B virus and include blood, blood products, lymph, semen, vaginal secretions, cerebrospinal, synovial, pleural, perineal, pericardial, and amniotic fluids.

Boiling – When a liquid is heated to a certain temperature, bubbles filled with saturated vapor will form in the interior of the liquid and rise to the surface.

Boiling Point – The temperature at which a liquid boils at 14.7 psia (760 mmHg). Decreasing the pressure lowers the boiling point.

Combustible Liquid – means any liquid having a flash point at or above 100 degrees Fahrenheit. Combustible liquids are divided into two classes as follows: Class II liquids – a flash point above 100 degrees Fahrenheit and below 140 degrees Fahrenheit; Class III liquids – flash point at or above 140 degrees Fahrenheit and class III is further divided into two subclasses – class IIIA liquids and class IIIB liquids.
**Compound** – A substance containing two or more elements chemically combined in definite proportions by weight.

**Conventional Pollutants** – means 5 day Biological Oxygen Demand (BOD5), Total Suspended Solids (TSS), pH, oil and grease and Fecal coliforms

**Density** – The ratio of the mass of a body to the volume of the body. In general, the numerical value of the density of a substance depends on the units used. When measured in centimeter-gram-second units, the density of any substance has practically the same numerical value as its specific gravity.

**Dew Point of the atmosphere** – That temperature to which the atmosphere must be lowered in order that the water vapor it contains should become saturated.

**Element** -- Substances which cannot be divided into simpler substances by ordinary chemical means.

**Evaporation** – The process by which a liquid is changed into the vapor state and mixed with the surrounding air.

**Extremely Hazardous Substance** – these substances are listed under Appendix A & B of 40 CFR 355.

**Extremely Hazardous Waste** – a waste that possesses one of the following characteristics: An acute oral LD₅₀ less than or equal to 50 milligrams per kilogram; an acute dermal LD₅₀ less than or equal to 43 milligrams per kilogram; an acute inhalation LC₅₀ less than or equal to 100 parts per million as a gas vapor; has been shown through experience or testing to pose an extreme hazard to public health due to its carcinogenicity, highly acute or chronic to toxicity or bioaccumulative properties or persistence in the environment or is water reactive.

**Fire Area** – shall mean an area of a building separated from the remainder of the building by construction having a fire resistance of at least 1 hour and having all communicating openings properly protected by an assembly having a fire resistance rating of at least 1 hour.

**Flammable liquid** – any liquid having a flash point below 100 degrees Fahrenheit. Class IA includes liquids having flash points below 73 degrees Fahrenheit and having a boiling point below 100 degrees Fahrenheit. Class IB include liquids having flash points below 73 degrees Fahrenheit and having a boiling point at or above 100 degrees Fahrenheit.

**Flash Point of a liquid** – The minimum temperature at which a liquid gives off vapor in sufficient concentration to form an ignitable mixture with the air near the surface of the liquid, within a specified type of vessel (open cup, closed cup).

**Friable Asbestos** – is any Asbestos Containing Material (ACM) defined by the Asbestos NESHAP as a material containing more than one percent (1%) asbestos, that, when dry, can be crumbled, pulverized or reduced to powder by hand pressure.

**Fume** – Solid particles generated by condensation of metals from the gaseous state, generally after volatilization from the molten state.

**Gas** – A formless fluid that will readily and uniformly distribute itself about its container. It can be changed to a liquid or solid by increased pressure, decreased temperature or both, if below its critical temperature. Has low density, low viscosity and obeys gas laws.

**Halogens** – The elements fluorine, chlorine, bromine, iodine, and astatine. They are poor conductors of heat and electricity and combine readily with hydrogen.

**Hazardous Chemical (OSHA)** -- means any chemical that is a physical or a health hazard. Includes chemicals that are toxic, highly toxic, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, carcinogens, and agents that damage lungs, skin, eyes or mucous membranes.

**Hazardous Materials (DOT)** – means any material that, because of its quantity, concentration, or physical or chemical characteristics, posses a significant present or potential hazard to human health safety, or to the environment. Hazardous materials include, but are not limited to, hazardous substances, hazardous waste, and any material which a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the work place or the environment.

A hazardous material is any substance or material which has been determined to be capable of posing an unreasonable risk to health, safety and property when transported (which has been so designated). Includes hazardous substances, hazardous wastes, marine pollutants and the following:

* The list of substances listed in part 49 CFR 172.101, the Department of Transportation Hazardous Material List, and that meets the
ENVIRONMENTAL COMPLIANCE PROGRAM

- Liquid – A state of matter in which the substance is a formless fluid that flows in accordance with the law of gravity.
- Molecule – The smallest portion of a compound capable of existing independently and retaining the properties of the original compound. Atoms of the same element that combine into pairs are also referred to as molecules (e.g. H2, O2).
- Non-friable ACM – is any material containing more than one percent (1%) asbestos, that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.
- NPDES – National Pollutant Discharge Elimination System.
- Organic – A term used to designate chemicals that contain carbon.
- Oxidation – A chemical change in which an atom loses one or more electrons and there is an increase in the oxidation number. Popularly used to describe the process in which oxygen combines with another element, although chemicals other than oxygen can be involved in the oxidation process.
- Petroleum Contact Water – means water containing product. Condensate from underground and aboveground petroleum tanks, water removed from a petroleum storage tank, water in contact with product such as water in secondary containment, sump and dispenser sump water.
- pH – Logarithm of the reciprocal of the molar concentration of the hydrogen ion; a scale indicating the acidity of a solution; if the pH is less than 7, the solution is acidic; if the pH is 7, the solution is neutral; if the pH is greater than 7, the solution is alkaline.
- Pollution Incident – A discharge or potential discharge of oil or other hazardous substance of such magnitude or significance as to require immediate response to contain, cleanup, and dispose of the material to prevent a substantial threat to public health or welfare, which includes threats to property, fish, shellfish wildlife and shorelines.
- Recycled Material – materials may not be a solid waste when they can be shown to be recycled, used or reused as ingredients in an industrial process to make a product.
Reduction – A chemical process in which an atom gains electrons and there is a subsequent decrease in the oxidation number.

Regulated Asbestos Containing Material (RACM) – RACM is a friable asbestos material, category I non-friable ACM that has become friable, category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting or abrading or category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations. (Category I non-friable is any asbestos-containing packing, gasket, resilient floor covering or asphalt roofing product. Category II non-friable is any asbestos-containing materials such as cement sidings, transit board shingles.)

Relative humidity – The ratio of the mass of water vapor per unit volume in the air to the mass per unit volume required to produce saturation, the temperature remaining unchanged.

Release – Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping or disposing into the environment, unless permitted or authorized by a regulatory agency.

RQ (Reportable Quantity) – means the quantity of hazardous substance as set forth in the reportable quantity, for example as established in 40 CFR 302.4. Any release equal to or greater than this amount is reported to the appropriate authorities immediately.

Safety can – an approved container of not more than 5 gallons capacity, having a spring-closing lid and spout cover and is designed that it will safely relieve internal pressure when subjected to fire exposure.

Sharps – objects capable of puncturing, lacerating, or otherwise penetrating the skin.

Solid Waste – All materials solid, liquid, semi-solid or contained gaseous material that is discarded or served its intended purpose. A manufacturing or mining by-product (exclusions – domestic sewage, CWA point source discharge, irrigation return flow and in-situ mining waste).

Specific Gravity – The ratio of the weight of a body to the weight of an equal volume of another substance.

Vapor – The gaseous form of substances that are normally in the solid or liquid state.

Vapor Density – The ratio of the weight of a volume of pure vapor or gas (with no air present) to the weight
on an equal volume of dry air at the same temperature and pressure.

**Vapor Pressure** – The portion of vapor that will form above the liquid as a mixture of air and the vapor when in a closed container.

**Vapor Volume** – The number of cubic feet of solvent vapor formed by the evaporation on one gallon of solvent.

**Viscosity** – The internal resistance of a substance to flow.

**Volatile** – The tendency or ability of a liquid to evaporate.

**Waste** – Any material for which no use or reuse is intended and which is to be discarded; any recyclable material; any material which poses a threat to public health or the environment and which meets either, or both, of the following conditions:
1. Is mislabeled or not adequately labeled (unless the material is correctly labeled 48 hours after the material is discovered to be mislabeled or inadequately labeled).
2. Is packaged in deteriorated or damaged containers, unless the material is contained in ground or undamaged containers within 48 hours after the containers are discovered to be deteriorated or damaged.

**Wastewater** – means the combination of liquid and water carried pollutants from residences, commercial buildings, industrial plants and institutions together with any ground water, surface water runoff or leachate that maybe present.

**Waters** – Coastal waters are marine waters navigable by deep draft vessels, seas, and waters subject to tidal influence. Inland waters are those waters upstream from the coastal waters. Navigable waters are those waters the USCG maintains surveillance. Ground waters are the waters below the land surface in the zone of saturation where water is at or above atmospheric pressure.

**Waters of the United States** – include: navigable waters, tributaries of navigable waters, interstate waters, intrastate lakes, rivers and streams to include those used by interstate travelers for recreation and other purposes or which are the source of fish or shellfish sold in interstate commerce or which are utilized for industrial purposes by industries engaged in interstate commerce.
CHAPTER 1. Hazardous Material Management Program

1.1 Storage, Grounding & Bonding, & Equipment Requirements:

Storage – chemical and product storage is an important function of an organization, proper storage, compatibility and maintenance of the storage area is one of the main pollution prevention means for spills and emergency operations. A well maintained storage area is an essential element in an effective environmental compliance program.

In general the storage of any containers will require protection from the elements, physical damage and unauthorized personnel. Storage of containers will be in a well ventilated area, protected from damage and protected from the weather elements. In case of an emergency or fire the storage of containers shall not physically obstruct egress of vehicular and pedestrian traffic. Also any liquid in containers that are stored shall be placed so that a leak would not prevent egress from the area. Any leaks will be prevented from spreading by means of a designed containment that is compatible with the chemicals stored.

Secondary Containment – secondary containment must be compatible with the chemicals or materials to be stored the area must be free of debris and cracks and impermeable to the spilled material or product. Secondary containment is an effective prevention technique, it can stop a leak from migrating from the original source. If built with adequate safeguards it also reduces the surface area exposed to evaporation which in-turn decreases the risk of employee exposure and reduces the risk of fire and explosion hazards.

Containers – all containers used and in storage will be in good structural condition. If the container begins to leak, its contents will be immediately transferred to a container in good condition. Labels will be legible and conform to the requirements of section 1.3.

Electrical – Electrical wiring and electrical equipment located in inside storage rooms used for Class I liquids shall be approved for Class I, Division 2 hazardous locations; for Class II and Class III liquids, will be approved for general use.

The integrity of electrical equipment and connectors should not be damaged or contaminated by foreign materials such as, paint, plaster, cleaners, abrasives or corrosives. Electrical wiring in corrosive environments must be protected.

Equipment & Tools – must be designed for the location, as in, non-sparking tools when working around flammable liquids. Cheater bars are prohibited to assist in the extension and leverage with tools.

Ventilation – Inside storage rooms for flammable materials must have either a gravity or mechanical exhaust ventilation system designed to provide for a complete change of air within the room at least six times per hour. The ventilation must be within 12 inches of the floor and make up air on the opposite side of an inside storage room within 12 inches of the floor. It is also considered adequate if the ventilation is sufficient to prevent accumulation of significant quantities of vapor-air mixtures in concentrations of over one-forth of the lower flammable limit. With areas used solely for storage of gas cylinders the ventilation rate must equal a change of air within the room of one (1) per hour. Depending on the hazard potential this rate may vary.

Air Conditioning – if air conditioning of chemicals is required all electrical components and wiring must be in accordance with the class and type of chemicals stored.

Fire Protection – Suitable fire control devices will be placed in available locations where hazardous materials are stored. For flammables, at least one portable fire extinguisher having a rating of not less than 12-B shall be located outside of, but not closer than 10 feet from the door opening into any room used for storage. Not less than 10 feet, nor more than 25 feet from any Class I or Class II liquid storage area outside of a storage room but inside a building.

Materials that react with water shall not be stored in the same room with flammables or combustibles.

Inventory Disclosure – inventories should be conducted periodically to determine quantity on hand proper storage and containment. In an effort to ensure that the proper prevention techniques are applied a simple site drawing indicating storage and the potential hazards that are present can be used and can aid the fire department or emergency response group with their decisions. (see attachment A)

Grounding & Bonding – grounding and bonding is a simple means to minimize the buildup of a charge. Grounding removes the charge from a body (accomplished by attaching a ground connection to a grounding rod) whereas bonding equalizes the charge
between two bodies. If there is a difference in potential between two bodies, a conduction if applied, would allow a charge or current to flow. To prevent an ignition it is necessary to control one or more of the following: the flammable vapor, air (O2), or source of ignition.

Static is generated when liquids move in contact with other materials. This occurs commonly in operations such as flowing liquids through pipes, in mixing, and when pouring, pumping, filtering and agitating.

Under certain conditions, particularly with liquid hydrocarbons, static may accumulate in the liquid. If the accumulation is sufficient a static spark may occur. If the spark occurs in the presence of a flammable vapor-air mixture an ignition may result. Therefore, steps must be taken to prevent the simultaneous occurrence of the two conditions.

From the standpoint of static electricity hazard, flammable liquids may be classified according to the following characteristics: static generating ability, conductivity and flash point.

When filling metal cans and drums with petroleum based products, a fill spout nozzle or fill pipe, if conductive, should be kept continuously in contact with the edge of the fill opening. Conductive funnels, strainers or other devices should likewise be kept in contact with both the fill nozzle and the container to avoid the possibility of a spark at the fill opening.

Under these circumstances the additional precaution of providing a bond wire is not warranted between the container and the fill connection. If the nozzle is not in contact with the container a bond wire is necessary unless the metal containers are bonded by using a metal plate under both containers.

Micro-filters, if used, should be as far upstream of the nozzle as practicable. Transfer lines downstream of the filters should be conductive.

Glass or other non-conducting materials of 5 gallons or less capacity are usually filled without special precautions.

**Flammable & Combustible Storage** — the following are types of storage and their requirements:

- **Basement** – Class I liquids shall not be stored in basements. Class II and IIIA liquids may be allowed as long as fire protection such as automatic sprinkler protection is provided.

- **Residential dwellings** – with detached or attached garages (not more than 3 dwellings) – storage of 25 gallons of class I & II liquids combined is prohibited and storage in excess of 60 gallons of class IIIA liquid is prohibited. More than 3 dwellings – storage in excess of 10 gallons of class I & II liquids combined or 60 gallons of class IIIA shall be in containers stored in storage cabinets, in safety cans, or in a separate inside storage area not having an opening into the area that is open to the public.

- **Office, educational and institutional occupancies** – storage is limited to maintenance and operation of the office, equipment, demonstration equipment and laboratory work. Never exceed 1 gallon of a class I liquid outside of an inside storage area except when using a safety can and then you are limited to 2 gallons. Never exceed a storage capacity of 10 gallons of a class I & II liquid combined in a fire area or zone that is outside of a storage cabinet or separate inside storage area. Never exceed a storage capacity of 25 gallons of a class I & II liquid combined in a fire area or zone in safety cans outside of a separate inside storage area or storage cabinet. Never exceed a storage capacity of 60 gallons of a class IIIA liquid in a fire area or zone that is outside of a separate inside storage area or storage cabinet.

- **General Purpose Warehouse** – storage of flammable and combustible liquids are limited. Any such storage shall be separate and restricted to a separate inside storage area or liquid warehouse. Depending on the commodity class stored and the type of sprinkler protection the height and quantity will vary.

- **Historic structures and storage of chemicals** – restoration equipment and the restoration/repair of display items shall be monitored carefully to preclude fire hazards. The accumulation of solvents, glues, paints and other flammable and combustible materials shall be stored in detached buildings or structures. Flammable and combustibles whether in liquid or solid state must be stored in closed listed safety cans or flammable storage cabinets.

- **Storage of chemicals that are easily accessible to employees requires that the responsible department trains the affected employees under Hazard Communication and ensure that safety data sheets are readily available.**
inches above the bottom of the cabinet. A 2-inch deep leak-proof sill will be provided to contain any spills. The cabinet must be marked in conspicuous lettering “FLAMMABLE – KEEP FIRE AWAY.” No more than 3 such cabinets shall be stored in the same fire area. Quantity is dependent on type of occupancy and if additional storage of cabinets and quantity is permitted it may be due to sprinkler or type of industrial occupancy. The cabinet is not required to be vented for fire protection purposes, but if vented for any reason, it shall be vented to the outside in a way that it will not compromise the performance of the cabinet. If it is determined that the cabinet is not to be vented then the vent openings shall be sealed with the bungs that are provided by the manufacturer.

Storage of flammable liquids that are incidental to the business and are used for maintenance purposes may be stored temporarily in closed containers, that are in good condition, outside of storage cabinets if the amount is limited to a not to exceed 10 day supply at anticipated consumption rate.

Safety cans – minimizes flammable vapor release, spillage and container rupture under fire conditions. Open storage or open containers shall never be used.

Inside storage rooms – floors must be liquid tight, sills or ramps must be at least 4 inches in height. Walls must have at least a 2-hour fire resistance rating, 1 ½ hour (B) fire doors. Electrical wiring dependent on liquid classification. Three (3) foot aisles must be maintained at all times.

Storage in inside storage rooms

<table>
<thead>
<tr>
<th>Fire Protection Provided</th>
<th>Fire Resistance</th>
<th>Max Floor area (sqft)</th>
<th>Total Allowable Quantities gal/sqft Floor area</th>
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<tbody>
<tr>
<td>YES</td>
<td>2Hr</td>
<td>500</td>
<td>10</td>
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<tr>
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<td>4</td>
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<tr>
<td>YES</td>
<td>1Hr</td>
<td>150</td>
<td>5</td>
</tr>
<tr>
<td>NO</td>
<td>1Hr</td>
<td>150</td>
<td>2</td>
</tr>
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Outside storage – no container or tank in a pile shall be more than 200 feet from a 12 foot wide access way for fire control apparatus. The quantity of liquids stored adjacent to a building may exceed 1100 gallons of liquid in closed containers and portable tanks provided the maximum quantity per pile does not exceed 1100 gallons and each pile is separated by 10 feet minimum clear space along the common wall of the building. A maximum of 1100 gallons may be stored adjacent to a building under the same management provided the adjacent building wall has an exterior fire resistance rating of 2 hours. Openings along the wall must not be within 10 feet horizontally of the storage and within 50 feet if the openings are below grade of the storage.

The storage area shall be graded in a manner to divert possible spills away from any buildings or other exposures or shall be surrounded by a curb at least 6 inches high. When curbs are used, provisions must be made to drain spills or rain water. Drains shall terminate at a safe location and shall be accessible to operations under fire conditions. The storage area shall be protected against tampering or trespassers and kept free of weeds, debris and other combustible materials not necessary to the storage.

Outdoor Liquid Storage (container storage max/pile)

<table>
<thead>
<tr>
<th>Class</th>
<th>Gal</th>
<th>Height feet</th>
<th>Distance between piles/racks</th>
<th>Distance to prop. line that can be built upon</th>
<th>Distance to street alley or public way</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA</td>
<td>1100</td>
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<td>5</td>
<td>50</td>
<td>10</td>
</tr>
<tr>
<td>IB</td>
<td>2200</td>
<td>12</td>
<td>5</td>
<td>50</td>
<td>10</td>
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<tr>
<td>IC</td>
<td>4400</td>
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<tr>
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<td>5</td>
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<tr>
<td>III</td>
<td>22000</td>
<td>18</td>
<td>5</td>
<td>10</td>
<td>5</td>
</tr>
</tbody>
</table>

Outdoor Liquid Storage (portable tank max/pile)

<table>
<thead>
<tr>
<th>Class</th>
<th>Gal</th>
<th>Height feet</th>
<th>Distance between piles/racks</th>
<th>Distance to prop. line that can be built upon</th>
<th>Distance to street alley or public way</th>
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<tr>
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</table>

Storage lockers located outside shall not exceed 1500 sq. ft. gross floor area. These lockers shall be able to contain 10% of the volume of containers allowed or the volume of the largest container whichever is greater. If used inside as a liquid storage room the construction of the locker must meet the fire-resistive ratings and applicable requirements of NFPA 30.

Cylinder Storage – in most cases cylinders should be stored in detached well ventilated or open sided buildings and chained or otherwise secured in an upright position at all times with the valve cap on (until use is required). These areas should have prominently posted signs, the cylinders should be secure from unauthorized individuals, and protected from the ground to prevent rusting, stored out of the sun and properly inventoried.
When using indoor areas for storage the cylinders should be safe from tampering from unauthorized individuals, not located near boilers, steam or hot water pipes or any source of ignition and chained or secured in an upright position at all times with the valve cap on (until use is required). If attached to a pressurized system, empty cylinders should be removed to avoid suck back. Glass equipment should not be pressurized. Bond and ground all cylinders, lines and equipment used with flammable compressed gases and do not store flammable gases with oxidizing gases. Flammable compressed gases should be stored in outside areas that are protected from the elements.

Remember when storing cylinders never drop, roll or permit the cylinders to strike each other violently. Do not transport cylinders in closed vehicles. Only use cylinders in an upright position. Oily fittings should never be used with oxygen and never handle oxygen when the hand, gloves or clothing is oily (oxygen under pressure rapidly oxidizes oily or grease which can result in an explosion). Store combustion supporting gases (oxygen, chlorine) at least 25 feet from flammable gas cylinders. Avoid acetylene direct contact with copper or brass, an explosive compound can form. Old stock should be used first.

Pesticide Storage – building locations shall be situated so that fire-fighting waters will not contaminate streams, ponds or other buildings. The following must be controlled in storage of pesticides: run-off, separation of leaking containers, visible and legible labels and the adherence to applicable regulations in the disposal of residues. To avoid moisture damage, containers shall be off floors. Pesticides that are flammable and combustible shall be stored according to NFPA 30. Pesticides that are oxidizers must be stored according to NFPA 43A. Oxidizers shall not be stored with flammables and combustibles.

Oxidizing Chemicals storage – these chemicals may provide oxygen to accelerate burning of other combustible material. Oxidizing chemicals should not be stored in the same area as combustible materials and flammable liquids. Store oxidizing chemicals with compatibles and never store in storage buildings that are combustible. Other non-compatibles are acids. Storage and handling of oxidizing chemicals must be in accordance with NFPA 43A and 43B.

Corrosives storage – caustics should not be stored with zinc, galvanized metals or aluminum due to the incompatibility of these metals. Contact with these metals may generate hydrogen gas. Acids also react with certain metals to form gases like hydrogen, and they can also produce great amounts of heat and possible detonation and releases of toxic gases.

1.2 Purchasing:

Before purchasing the chemical or product the department or division should determine if the chemical or product is hazardous or toxic. If hazardous or toxic, is an alternative that is less hazardous or non-hazardous available, if not then is there an SDS readily available for review by the employees that will use the chemical or product.

Purchase orders, purchase contracts or requests for bids should contain the following statement when chemicals, petroleum products or hazardous material are ordered (the purchase request from the department or division should also contain this statement): “On or before the first shipment of a chemical, petroleum product or hazardous material an SDS will be sent to the receiving department and Risk Management for review.”

It is recommended that the Risk Management division be contacted prior to any purchase to assist the department in the compliance with applicable standards.

1.3 Labeling:

All materials, chemicals hazardous and non-hazardous, petroleum products must be labeled with the appropriate markings, the identity or trade name (common name), hazard type and warnings or precautions.

Never remove a label, paint over a label or deface a label.

Labeling of in-house containers can be accomplished by printing or writing the trade name and identifying the hazard by using a word, picture or through an industrial standard such as the NFPA diamond or through HMIS. (see attachment B. NFPA rating)
1.4 Housekeeping & Handling of materials:

Aisles, passageways and stairwells will be kept clear of tools, hoses, trash and shall not be used for storage of any materials. Egress areas must not only be kept clear of the storage of liquid containers as discussed in Section 1.1 Storage, but also materials that could roll or slide out into the path of travel must be kept clear or stored in a manner that precludes this hazard. Scrape material and trash or rubbish shall be placed in containers designated for that purpose. This will provide segregation, recycling opportunities and avoidance of injury to employees and equipment.

Chemicals will be sealed, closed tightly and in accordance with Section 1.1 Containers.

Tools and equipment shall be placed in a designated area, cleaned after every use and prior to storage. This will avoid cross contamination, mishandling of equipment or tools and damage to other equipment or injury to employees.

Chemicals and materials will be moved or transported in closed tight containers, precautions will be taken in the event of a spill or leak. Compatibility will be determined prior to loading and transporting. Proper loading of the vehicle or pallet will be accomplished prior to transportation to avoid weight shifts and inadvertent tipping of the material/chemical.

1.5 Training:

Training consists of requirements that may vary with the content and responsibility as defined by the Code of Federal Regulations 29 CFR 1910, 1926, 40 CFR 265, 49 CFR 171-178. The handling, storage, fire prevention, transportation, emergency response, level of preparedness and prevention, recycling and notification requirements and responsibilities must be addressed at some level of competency for each county employee.

Examples are as follows:

<table>
<thead>
<tr>
<th>Type</th>
<th>29CFR</th>
<th>49CFR</th>
<th>40CFR</th>
<th>County Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warehouse</td>
<td>1910.38</td>
<td>171-178</td>
<td>265</td>
<td>Contingency</td>
</tr>
<tr>
<td></td>
<td>1910.120</td>
<td>302</td>
<td>Preparedness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1910.145</td>
<td>370</td>
<td>&amp; Prevention</td>
<td></td>
</tr>
<tr>
<td>Response Personnel</td>
<td>1910.120</td>
<td>171-178</td>
<td>261-279</td>
<td>Contingency</td>
</tr>
<tr>
<td>Hazardous Waste</td>
<td>1910.132</td>
<td>302</td>
<td>Preparedness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1910.134</td>
<td>355</td>
<td>&amp; Prevention</td>
<td></td>
</tr>
</tbody>
</table>

1.6 Hazard Communication:

This is discussed and outlined by Section 7 of the Safety and Health Manual (see attachment C.).

1.7 Safety Data Sheet (SDS):

Prior to receiving a chemical, product or material that has a hazardous ingredient as one of its components and on the first shipment of that substance an SDS is required. With this process in place a substance can be determined to be safe for use or determined what precautions may be required to be taken to avoid over exposure to the substance prior to it ending up in a department or divisions storage or in the hands of that department or divisions employee.

In reviewing the SDS one can obtain information on its contents, toxic characteristics, fire hazard if any, compatibility, health hazard, first aid steps to take incase of acute or chronic exposure, storage compatibility, spill and cleanup procedures and the personal protective or engineering equipment required or needed when working or using the substance (see attachment D.).

1.8 SARA:

Hazardous chemical reporting Community Right to Know. Orange County submits Tier II reports by March 1 of every year for the materials present on the facility during the prior year. Submission of this Tier Two form (when requested by the state) is required by Title III of the Superfund Amendments and Reauthorization Act of 1986, Section 312, Public Law 99-499, codified at 42 U.S.C. Section 11022. The purpose of this Tier Two form is to provide State and local officials and the public with specific information on hazardous chemicals present at your facility during the past year. (The State requests submission every year.)

This request may apply to the owner or operator of any facility that is required, under regulations implementing the Occupational Safety and Health Act of 1970, to prepare or have available a Safety
Data Sheet (SDS) for a hazardous chemical present at the facility. SDS requirements are specified in the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, found in Title 29 of the Code of Federal Regulations 1910.1200.

This form does not have to be submitted if all of the chemicals located at your facility are excluded under Section 311(e) of Title III.

Section 311(e) of Title III excludes the following substances:

Any food, food additive, color additive, drug, or cosmetic regulated by the Food and Drug Administration:

(I) Any substance present as a solid in any manufactured item to the extent exposure to the substance does not occur under normal conditions of use;

(II) Any substance to the extent it is used for personal, family, or household purposes, or is present in the same form and concentration as a product packaged for distribution and use by the general public;

(III) Any substance to the extent it is used in a research laboratory or a hospital or other medical facility under the direct supervision of a technically qualified individual;

(IV) Any substance to the extent it is used in routine agricultural operations or is a fertilizer held for sale by a retailer to the ultimate customer.

OSHA regulations, Section 1910.1200(b), stipulate exemptions from the requirement to prepare to have available an SDS.

Minimum thresholds have been established for Tier One/Tier Two reporting under Title III, Section 312. These thresholds are as follows:

For Extremely Hazardous Substances (EHSs) designated under Section 302 of Title III, the reporting threshold is 500 pounds (or 227 kg.) or the threshold planning quantity (TPQ), whichever is lower. (40 CFR 302)

For all other hazardous chemicals for which the facility is required to have or prepare an SDS, the minimum reporting threshold is 10,000 pounds (or 4,540 kg.).

Tier One form or Tier Two form(s) is submitted to each of the following organizations:
2. Your Local Emergency Planning Committee.
3. The fire department with jurisdiction over your facility.

If a Tier Two form is submitted in response to a request, send the completed form to the requesting agency.

The report is submitted for the appropriate calendar year, beginning January 1 and ending December 31.

For each hazardous chemical, you must estimate the greatest amount present at your facility on any single day during the reporting period. (see Attachment E for a copy of the State request)

### Hazard Category Comparison

**For Reporting Under Sections 311 and 312**

<table>
<thead>
<tr>
<th>EPA’s Hazard Categories</th>
<th>OSHA’s Hazard Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire Hazard</td>
<td>Flammable</td>
</tr>
<tr>
<td></td>
<td>Combustion Liquid</td>
</tr>
<tr>
<td></td>
<td>Pyrophoric</td>
</tr>
<tr>
<td></td>
<td>Oxidizer</td>
</tr>
<tr>
<td>Sudden Release of</td>
<td>Explosive</td>
</tr>
<tr>
<td>Pressure</td>
<td>Compressed Gas</td>
</tr>
<tr>
<td>Reactive</td>
<td>Unstable Reactive</td>
</tr>
<tr>
<td></td>
<td>Organic Peroxide</td>
</tr>
<tr>
<td></td>
<td>Water Reactive</td>
</tr>
<tr>
<td>Immediate (Acute) Health Hazards</td>
<td>Highly Toxic</td>
</tr>
<tr>
<td></td>
<td>Toxic</td>
</tr>
<tr>
<td></td>
<td>Irritant</td>
</tr>
<tr>
<td></td>
<td>Sensitizer</td>
</tr>
<tr>
<td></td>
<td>Corrosive</td>
</tr>
<tr>
<td></td>
<td>Other hazardous</td>
</tr>
<tr>
<td></td>
<td>chemicals with an</td>
</tr>
<tr>
<td></td>
<td>adverse effect with</td>
</tr>
<tr>
<td></td>
<td>short term exposure</td>
</tr>
<tr>
<td>Delayed (Chronic) Health Hazard</td>
<td>Carcinogens</td>
</tr>
<tr>
<td></td>
<td>Other hazardous</td>
</tr>
<tr>
<td></td>
<td>chemicals with an</td>
</tr>
<tr>
<td></td>
<td>adverse effect with</td>
</tr>
<tr>
<td></td>
<td>long term exposure</td>
</tr>
</tbody>
</table>

Form R also known as section 313 is in general an annual summary of any release of certain listed toxic chemicals into the environment. This includes any listed toxic chemical that is allowed to enter any environmental medium, such as, air, water or soil. Releases of these toxic chemicals include the transfer to offsite landfills or other treatment facilities, discharges to municipal sewer systems, air emissions, fugitive emissions, discharges to surface water, on site land filling also included are accidental spills.
A facility that is required to submit a Form R must meet the following:

1. Have 10 or more full-time employees
2. Have an SIC of
   - 10 (except 1011, 1081 and 1094)
   - 12 (except 1241)
   - 20-39
   - 4911, 4931 or 4939 (limited to facilities that combust coal &/or oil to generate power for distribution in commerce)
   - 4953 (limited to facilities that are regulated under RCRA subtitle C 42 U.S.C. Section 6921)
   - 5169, 5171, or 7389 (limited to facilities engaged in solvent recovery services on a contract or fee basis)
3. The chemical is listed in 40CFR 372.65 and
4. It manufactures, processes, or otherwise uses the chemical in excess of the threshold quantities established in section 313

**Manufacture means -- to produce, prepare, import or compound toxic chemical by-products, processing or use of the chemical.**

EPA may apply requirements of 313 to facilities that do not meet these 4 areas but because the facilities handle toxic chemicals and because of their proximity to population centers and chemical release history the EPA feels it is warranted.

The table of sections previously discussed is summarized below:

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Amount Required</th>
<th>Reporting Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>301-303</td>
<td>Emergency planning – 356 Extremely Hazardous Substances (EHS)</td>
<td>TPQ of 1-10,000lbs on site (at any one time), if you see 5000/10,000lbs the lower quantity applies to a solid if it exists as a powder and has a particle size &lt;100 microns or is handled in solution or in molten form or meets the NFPA of 2,3 or 4 for reactivity</td>
<td>One time notification to SERC</td>
</tr>
<tr>
<td>304</td>
<td>Emergency release notification -- &gt;1,000 substances</td>
<td>RQ 1-5,000lbs released in a 24 hour period, Each time there is a release above an RQ a report to the SERC and LEPC is required</td>
<td>Per Occurrence</td>
</tr>
<tr>
<td>311-312</td>
<td>Hazardous chemical storage – 500,000 products</td>
<td>TPQ or 500lbs for section 302 chemicals, 10,000lbs for all others (quantity on hand at any one time)</td>
<td>Annually reported by March 1 to the SERC, LEPC and Fire Dept. 311 is a one time submission only with updates as needed for added chemicals or new information to SERC, LEPC and Fire Dept.</td>
</tr>
<tr>
<td>313</td>
<td>Toxic Chemical Release Inventory – 650 Toxic chemicals and categories</td>
<td>25,000lbs/yr manufactured or processed, 10,000lbs/yr used, and certain persistent bio-accumulative toxics have lower thresholds</td>
<td>Reported to the EPA and State annually by July 1</td>
</tr>
</tbody>
</table>

There are exceptions for toxic chemicals such as, de-minus concentrations (<1%), janitorial chemicals and vehicle maintenance products (See 40 CFR 372).

### 1.9 Risk Management Plan (RMP)

The purpose of the RMP is to ensure that facilities reduce the likelihood and severity of a chemical accident. In doing so the RMP also requires facilities to focus on the safety of the public and the environment through chemical accident preparedness, response and prevention.

The owner or operator that is required to submit an RMP submits: information relevant to the accidental release prevention and emergency response policies at the stationary source; the stationary source and regulated substances handled (40 CFR 68.130); the worst case release scenario and the alternative release scenario including the administrative controls and mitigation measures to limit the distances for each reported scenario; the general accidental release prevention program and chemical specific prevention steps; a five year accident history; the emergency response program that has been developed and planned changes to improve safety. (see attachment F, 40 CFR 68 and Risk Management Form)

The RMP developed from planning and legislative initiatives introduced since 1968 (The National Contingency Plan (NCP) in 1968, the Chemical
Emergency Preparedness Program started after the accident in Bhopal India in 1984, the Accidental Release Prevention requirements under 112r of the Clean Air Act (CAA) as amended in 1990). In 1998 the Chemical Safety Board began operation. Formed as an independent board, one of the objectives, as directed under the CAA Section 112(r)(6), to investigate, determine and report to the public, the facts, conditions, circumstances and cause or probable cause of any accidental release resulting in fatality, serious injury or substantial property damage.

The “General Duty Clause” Section 112 (r)(1) of the CAA expands the activities that EPA can take to help promote chemical safety. Owners and operators of stationary sources producing, processing, handling or storing extremely hazardous substances have a general duty to: identify hazards associated with a potential accidental release, using appropriate hazard assessment techniques; design and maintain a safe facility, taking steps to prevent releases and minimizing the consequences of accidental releases that do occur.

1.10 Process Safety Management

Process Safety Management, 29 CFR 1910.119 was developed by OSHA and created to manage hazards and assure safe and healthy workplaces associated with processes that use highly hazardous chemicals (toxics, reactives, flammables and explosives). The standard was issued in the federal register February 24, 1992. This standard applies to processes that involve a chemical at or above the specified threshold quantity listed in attachment G.

The standard also applies to processes that involve a flammable liquid or gas on site at one location in quantities of 10,000 pounds or more (there are exceptions, such as, hydrocarbon fuels used as a fuel for workplace consumption etc.).

Prior to 1992, chemical process accidents took a toll on human life: 1965 chemical plant explosion, Louisville Kentucky; 1966 chemical plant explosion, Quebec; 1967 Hawthorne chemical explosion, New Jersey; 1973 Staten Island LPG tank explosion, New York; 1974 Flixborough Cyclohexane explosion, United Kingdom; 1976 Lapua munitions works explosion, Finland; 1977 Seveso dioxin release, Italy; 1984 Bhopal, methyl isocynate release, India; 1985 Union carbide, aldicarb oxide/methyl chloride release, West Virginia; 1989 Phillips chemical plant explosion and fire, Texas; 1990 Arco chemical explosion, Texas; 1991 BASF explosion, Ohio; 1992 IMC explosion and fire (this is a partial listing).  All total, slightly less than 4,000 people dead. Post PSM requirements – less than 20 dead.

As the CAA amendments came into effect, Section 304 of the CAA amendments required the Secretary of Labor and the Administrator of EPA pursuant to the OSH Act of 1970 to promulgate a chemical process safety standard to prevent accidental releases of chemicals that could pose a threat to employees. The elements of the process safety management program are:

- Process Safety information
- Process Hazard analysis
- Pre-startup safety review
- Mechanical Integrity
- Trade Secrets
- Employee participation
- Contractor Safety
- Training
- Management of Change
- Written Operating Procedures
- Non-routine work authorizations
- Compliance audits
- Emergency Preparedness
- Incident investigation

As discussed there are 14 requirements of the PSM. In further detail they are:

1. Develop and maintain written safety information identifying workplace chemical and process hazards, equipment used in the processes and technology used in the processes;
2. Perform a workplace hazard assessment, including, as appropriate, identification of potential sources of accidental releases, identification of any previous release within the facility that had a potential for catastrophic consequences in the workplace, estimation of workplace effects of a range of releases, and estimation of the health and safety effects of such a range on employees;
3. Consult with employees and their representatives on the development and conduct of hazard assessments and the development of chemical accident prevention plans and provide access to these and other records required under the standard;
4. Establish a system to respond to the workplace hazard assessment findings which shall address prevention, mitigation and emergency response;
5. Review periodically the workplace hazard assessment and response system;
6. Develop and implement written operating procedures for the chemical processes, including procedures for each operating phase, operating limitations, and safety and health considerations;

7. Provide written safety and operating information for employees and employee training in operating procedures, by emphasizing hazards and safe practices that must be developed and made available;

8. Ensure contractors and contract employees are provided with appropriate information and training;

9. Train and educate employees and contractors in emergency response procedures in a manner as comprehensive and effective as that required by the regulation promulgated pursuant to section 126(d) of the Superfund Amendments and Reauthorization Act;

10. Establish a quality assurance program to ensure that initial process-related equipment, maintenance materials, and spare parts are fabricated and installed consistent with design specifications;

11. Establish maintenance systems for critical process-related equipment, including written procedures, employee training, appropriate inspections, and testing of such equipment to ensure ongoing mechanical integrity;

12. Conduct pre-startup safety reviews of all newly installed or modified equipment;

13. Establish and implement written procedures managing change to process chemicals, technology, equipment and facilities;

14. Investigate every incident that results in or could have resulted in a major accident in the workplace, with any findings to be reviewed by operating personnel and modifications made, if appropriate.

As seen in section 1.9 the RMP focuses on the environmental, health and safety of the community as well as the employees, whereas, the PSM focuses on environmental, safety and health issues relevant to the employees (see attachment G, 1910.119 PSM).

### 1.11 Petroleum Tanks

In general aboveground and underground petroleum tanks require the following administrative records to be in place and maintained:

**Registration required for:**
- Aboveground tanks > 550 gallons
- Underground tanks > 110 gallons (if 10% or more of tank is in the ground, including piping, tank is considered underground tank)

- A current FDEP registration placard
- A current certification of financial responsibility
- A permit if required by local authorities having jurisdiction (construction, Fire)
- Storage tank inventory (2 years)
- Monthly inspections, release detection results, maintenance (see attachment H for Records and Systems)

The placement of underground tanks storing Class I, II or III liquids shall not be less than 1 foot from the nearest wall of any pit or basement and not closer than 3 feet (Class I), 1 foot (Class II and III) to any property line that can be built upon.

For aboveground tanks the placement will take into consideration the distance to a fence line, public way or to an important building on the same property or to the foundation of a structure. In general aboveground tanks 275 gallons or less must maintain 5 feet from the property line that is or can be built upon, including the opposite side of a public way and 5 feet from the nearest side of any public way or from the nearest important structure on the same property. At 276 to 700 gallons capacity it is 10 feet and 5 feet respectively. At 751 to 12,000 gallons it is 15 feet and 5 feet respectively and for 12,001 to 30,000 gallons it is 20 feet and 5 feet respectively.

Control of spills will be provided so that any accidental discharge of a flammable or combustible liquid would be prevented from endangering property, waterways or important facilities.

LP-gas shall not be stored with Class I, II or IIIA liquids. The minimum horizontal separation between an LP-gas container and a Class I, II or IIIA liquid storage tank shall be 20 feet. Suitable means shall be taken to prevent Class I, II or IIIA liquids from accumulating under LP-gas containers. When flammable or combustible liquids are in a diked area the LP-gas containers shall be outside the diked area and at least 10 feet away from the centerline of the wall of the diked area.

If the tank capacity is greater than 42,000 gallons underground or greater than 1320 gallons aboveground (no single container has a capacity greater than 660 gallons) and a spill could reasonably be expected to reach navigable waters a Spill Prevention Control and Counter measures plan (SPCC) must be prepared by a PE.
**ENVIRONMENTAL COMPLIANCE PROGRAM**

1.12 Chlorine Containers

Chlorine must be managed with care since it can cause severe injury or death if released into the atmosphere. Personnel that are trained in the handling of chlorine must be the only authorized individuals present during the shipment/movement and connection or change out of cylinders/containers.

Chlorine is not an explosive or flammable but will support combustion through oxidation. At normal temperatures chlorine can react with some metals like aluminum, arsenic, gold, mercury, selenium, and tin. Titanium reacts violently. Depending on the temperature of chlorine reactions with various others metals can occur. Inorganic reactions make chlorine a strong oxidizing agent. Organic compounds such as hydrocarbons and alcohols can create extremely violent reactions. Chlorine is only slightly soluble in water and can form weak solutions of hydrochloric and hypochlorous acids. To minimize external corrosion atmospheric moisture and extreme increases in temperature must be avoided.

Chlorine used in the county predominantly comes in cylinders and ton containers. Cylinders range from 1-150lbs (usually 100-150lb cylinders are used). A steel valve protective housing is provided on the top and should remain in-place when there are no connections to the cylinder or when moving or handling the cylinder. Always secure containers or cylinders from rolling. The use of a hand truck is permitted as long as the cylinder is held in place by a clamp or chain (located 2/3 up the cylinder). The use of slings or magnetic devices should not be used to lift cylinders. Never lift the cylinder by the neck or valve housing. Ton containers should be moved using a monorail or crane with a lifting beam. If using forklifts to move the container, the container must be adequately restrained to prevent movement when the forklift changes direction. The forklift must also have the capacity to lift the load (see attachment 1 for chlorine safety bulletins and for additional information).

Cylinders or containers of chlorine can be stored indoors or outdoors. Keep the areas clear of debris if stored outdoors and never store near elevator shafts, stairwells or ventilation systems. If standing water is possible in the storage area then make arrangements to use platforms. To avoid the falling of objects on to the cylinders or containers do not store items above them. Also avoid storage areas where vehicles may strike them. Subsurface areas of storage should be avoided and access to the containers or cylinders should be only by authorized employees. If stored inside, monitoring equipment should be available, two exists should be provided, protection from fire hazards maintained and ventilation provided and serviceable. In case of a leak, ventilation should be designed so that one air exchange in less than 4 minutes can be accomplished with no discharge released in such a manner as to endanger health and damage property. Exhaust vents should be placed near the floor and fresh air or make-up air vents should be placed midway up the wall. Switches to the fans or vents should be on the outside even with inside switches installed. The fans and vents should be compatible with the chlorine.