

ATTACHMENT F
PROCEDURES TO PREVENT HAZARDS
[270.A (270.14(b)(2, 5, 6, 8, 9))]

SECTION F

PROCEDURES TO PREVENT HAZARDS

TABLE OF CONTENTS

F	PROCEDURES TO PREVENT HAZARDS	F-1
F.1	Security.....	F-1
F.1.1	Security Procedures and Equipment	F-1
F.1.1.1	Twenty-Four Hour Surveillance System.....	F-2
F.1.1.2	Barrier and Means to Control Entry	F-2
F.1.1.3	Warning Signs	F-3
F.2	Inspection Schedule	F-3
F.2.1	General Inspection Requirements	F-4
F.2.1.1	Types of Problems.....	F-6
F.2.2	Specific Operational Inspection Requirements	F-7
F.2.2.1	Container Inspection.....	F-7
F.2.2.2	Tank System Inspection	F-8
F.2.2.3	Laboratory Inspection.....	F-9
F.3	Preparedness and Prevention.....	F-9
F.3.1	Equipment Requirements	F-10
F.3.1.1	Internal Communications.....	F-10
F.3.1.2	External Communications.....	F-11
F.3.1.3	Emergency Equipment	F-11
F.3.1.4	Fire Control Equipment.....	F-11
F.3.2	Aisle Space Requirement.....	F-12
F-4	Preventive Procedures, Structures and Equipment	F-13
F.4.1	Unloading Operations	F-13
F.4.1.1	Containers	F-13
F.4.1.2	Tanker Trucks	F-14
F.4.2	Run-off.....	F-15
F.4.3	Water Supplies	F-16
F.4.4	Equipment and Power Failure	F-16
F.4.5	Personnel Protective Equipment.....	F-18
F.4.6	Releases to the Atmosphere.....	F-19
F.5	Prevention of Reaction of Ignitable, Reactive, and Incompatible Wastes	F-20
F.5.1	Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Wastes.....	F-20
F.5.2	General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Wastes.....	F-21
F.5.3	Management of Ignitable or Reactive Waste in Containers	F-22
F.5.4	Management of Incompatible Wastes in Containers.....	F-22

TABLE OF CONTENTS

(Continued)

F.5.5	Management of Ignitable or Reactive Wastes in Tanks.....	F-23
F.5.6	Incompatible Wastes in Tanks.....	F-23

TABLES

F-1 Example Inspection Schedule and Procedures

FIGURES

F-1 Safety Equipment Layout

EXHIBITS

F-1 Example Container Storage Area Inspection Form
F-2 Example Safety and Security Inspection Form
F-3 Example Tank System Inspection Form
F-4 Example Laboratory Inspection Form
F-5 Example Tank Inventory Log
F-7 Echotel Model 910 Ultrasonic Level Switch Installation and Operating Manual

APPENDICES

F-1 Fire Protection System, Technical Demonstration

F PROCEDURES TO PREVENT HAZARDS

F.1 SECURITY

The Clean Harbors facility has security provisions in-place intended to prevent the possibility for unknown and unauthorized contact with waste by persons or animals in active waste management areas. The facility is not open to the public. Entry is limited to authorized employees, waste haulers and escorted visitors. Figure B-1 presents a plan view of the site which indicates the location of all property lines, security fences, walls, gates, and warning signs.

The specific A.A.C. 264.A (264.14) security requirements are addressed in the following sections.

F.1.1 Security Procedures and Equipment

The perimeter of the active portion of the facility is delineated with a combination of fencing that stands between seven and eight feet tall. This combination includes a chain-link fence or block wall topped with three strands of barbed wire or rolled concertina wire on all perimeter fencing. The facility can be accessed through six gates. Five of the six gates remain secured at all times. The sixth facility gate provides access to the administrative office and is open during normal business hours (approximately 8 AM to 5 PM, Monday through Friday). Access to the active portion of the facility, through the administrative office, is controlled by administrative personnel and a secured doorway. Figure B-1 shows the location of fences and gates at the facility.

Vehicle gates use electronically controlled opening/closing mechanisms with the control panel for each gate located inside the facility. These gates can be opened manually in case of a power failure. Personnel gates use a combination keypad entry to enter the facility and a manual latch to exit. Personnel gates are locked with an additional lock during non-business hours. Light sensors control the operation of overhead lighting that illuminates the facility from dusk until dawn.

F.1.1.1 Twenty-Four Hour Surveillance System

Twenty-four-hour per day, seven-day per week surveillance is maintained at the site by facility employees and/or a contract security service. Site employees are always vigilant of people that are authorized to be on the premises. If a person appears to be an unauthorized person, employees will approach that person to determine their reason for being on site. If they do not have a legitimate purpose for being on site they will be escorted off site.

During times when employees are not present, a combination of security guards and/or remotely monitored surveillance equipment is used to monitor the facility. The monitoring equipment consists of motion detectors and video cameras strategically aimed throughout the facility. The video cameras constantly record the images for future review. When the motion detectors are triggered, the offsite security company instantly views the video cameras for the corresponding motion detector to review the cause. Any concerns that need further investigation are immediately called to the site person on call to investigate the situation. There are also multiple fire detectors around the facility that are monitored by the offsite security company. If a fire is detected, the security company has instructions to immediately call the Fire Department and then the local site person on call.

Security guards may be used on site to patrol inside the perimeter of the facility to watch for unauthorized entry or other disturbances. The security guards have authority to call the Police or Fire Department for emergencies and the local site person on call.

F.1.1.2 Barrier and Means to Control Entry

A facility employee must open the truck entrance gates for both the entry and egress of trucks hauling hazardous wastes or authorized contractors into the active waste handling areas of the facility. The gates along Lincoln Street may remain open in the event of a fire or other emergency and during certain training drills but will be monitored to control access. The gate to the

administrative personnel/visitor's parking area is open during business hours; however access to the active portion of the facility is controlled. Visitors and contractors must sign-in at the administrative or operations office before being escorted into the yard.

F.1.1.3 Warning Signs

Warning signs legible from a distance of at least twenty-five feet are posted at all fence gates located around the perimeter of the facility. In addition, signs are posted along the fences that border the site. The signs are posted in English and Spanish, and they read as follows:

DANGER

UNAUTHORIZED

PERSONNEL

KEEP OUT

PELIGRO

PROHIBIDA LA ENTRADA

A PERSONAS

NO AUTORIZADAS

F.2 INSPECTION SCHEDULE

In accordance with the regulatory requirements set forth in 264.A (264.15) and 270.A (270.14), the facility has developed an Inspection Schedule for its hazardous waste facility. The inspection process is a formalized, routine, documented means of investigation, discovery, and repair of items at the facility to prevent harm to human health or the environment. Although not a formal process of investigation, during the normal course of duties, facility employees may discover issues of concern. The employees are obligated to correct or report any issues of concern upon discovery. Non-emergency items of concern discovered by employees during the normal course of work duties may not be recorded on the formalized inspection logs if corrected before the formalized inspection is completed.

The procedures set forth below assure that the facility will be in compliance with inspection requirements.

F.2.1 General Inspection Requirements

All hazardous waste storage and treatment areas are inspected during each day of operation. The inspector visually inspects containers and tanks for indications of leakage and deterioration. The containment areas surrounding the drums and tanks are also inspected for cracks, deterioration, coating integrity, leaks, and spills. The overall facility is inspected during each normal business day (i.e., Monday thru Friday, except holidays). The facility inspection includes security fences, non-regulated storage areas, and general facility housekeeping.

Any deterioration or desecration of the containers, tanks, or containment structures will be remedied as quickly as possible to ensure that identified problems do not become an environmental or human health hazard. Releases such as leaking drums, will be contained and cleaned-up immediately upon discovery. All releases are reported to the Operations Manager, Process Manager or to the Environmental Compliance Manager for proper compliance with all reporting requirements. Other deviations from inspection standards will be remedied on such a schedule that the problem does not lead to an environmental or human health hazard. All deviations noted on an inspection report will be documented when corrected.

An inspection schedule is presented on Table F-1 for the facility that shows items to be inspected, frequency of inspection, and problems that may be encountered. Inspection records (see Exhibit F-1, F-3, F-4, and F-5) include the date and time of the inspection, the inspector, any observations, and the date and nature of any repairs or remedial actions, and the individual completing repairs. Each line item of the inspection report provides a comment section that the inspector can complete with all relevant data to instruct others to find the issue. A typical inspection comment for a container would include the container identification number, row number, and the issue. If more than one similar issue exists, e.g., several labels need replacing, these issues can be combined into one inspection repair item or additional comments can be created at the bottom of the inspection report. The inspection records are reviewed by the Environmental Compliance Manager and are maintained at the facility for a minimum of three years from the date of the inspection.

In addition to the daily inspections, personnel at the facility inspect safety and security equipment on a weekly basis. These inspections insure that the facility is prepared and equipped to respond to environmental or human health hazards. This weekly inspection includes the personal protective equipment inventory, spill response supplies (such as overpack drums and absorbent), fire suppression monitoring system, security system, fire extinguishers, safety showers, eyewashes, equipment necessary for emergency responses (pumps, hoses, and forklifts), and first aid supplies.

Safety and Security inspection forms (see Exhibit F-2) include the date and time of the inspection, the inspector, observations, and the date and nature of any repairs or remedial actions and the individual completing the repairs. Inspection records are reviewed by the Environmental Compliance Manager and are maintained at the facility for a minimum of three years from the date of the inspection.

The facility also performs non-routine inspections of items that require more than a visual check. The facility uses outside contractors with expertise in their field to perform these inspections. Inspections of this nature include, checking the fire suppression system for proper operation, checking fire door operation, and checking fire extinguishers for operational specifications. These inspections are performed as required by the manufacturer or as required by city and state code. Inspection results are kept in the operating record for a minimum of three years.

If routine inspections reveal that non-emergency maintenance is needed, the situation will be corrected as soon as possible to preclude further damage and reduce the need for emergency repairs. If a non-compliance item creates an imminent hazard, remedial action will be taken immediately. If necessary, facility personnel will notify the appropriate authorities pursuant to the Contingency Plan (Section G) and initiate the appropriate action to protect human health and the environment. In the event of an uncontrolled release of hazardous waste, all efforts will be directed toward containment. Subsequent removal and decontamination of affected materials will be initiated. Refer to "spill containment" in the Contingency Plan for additional details (Section G). A list of equipment maintained at the facility for the prevention, response to, and clean-up of spills, fires or other

emergency events is presented in Exhibit G-4.

The example inspection forms, shown as exhibits in this section are typical forms used by the facility. The forms are subject to change and may change to equivalent or alternate forms based upon changes in the regulations, facility operations, company policy or other needs. In addition, these forms or documentation may be received, stored, transmitted and/or retrieved electronically in addition to, or in lieu of, hard (paper) copy. Any electronically collected data will be available for review in the same format as the respective example inspection forms presented in the exhibits of this section. Inspection logs detailing the results of the daily, weekly and periodic inspections are maintained for a minimum of three years.

F.2.1.1 Types of Problems

The following types of problems may potentially occur at the facility:

- Breach of security, resulting from: damage to fences, or entry control structures; obstructions; damage or loss of warning signs; or failure of the surveillance system;
- Releases, resulting from waste-container malfunction or failure;
- Fire caused by chemical reaction between incompatible materials.

Examples of the facility's daily and weekly inspection forms, with an outline of the items to be inspected are presented in Exhibits F-1 through F-5. The inspection logs and schedule contain the minimum inspection standards to use when inspecting the facility. The inspectors must be diligent and observant in their inspection procedure to identify situations that potentially create an issue. Daily, weekly and periodic checks are required to prevent the failure of containment, structures, routine or emergency equipment. These checks include, but are not limited to, the container and tank storage areas, operating equipment and structural equipment. These inspection logs will be revised to include new units or areas as they are added to the facility. These logs are only example logs; the format of these logs may change to better control waste management activities and

handling practices.

F.2.2 Specific Operational Inspection Requirements

The operational units at the facility listed below are subject to operation specific inspection schedules and procedures presented in this section:

- Container storage areas.
- Tank storage area.
- Laboratory.

Equipment and structures at each unit are regularly inspected for malfunction, deterioration, failure, operator errors or other issues that could endanger human health or the environment. The potential problems and the hazards uniquely associated with the facility's operational units were used to establish the parameters and frequency of inspections as presented in the following sections.

F.2.2.1 Container Inspection

The potential problems related to the facility's drum (container) storage structures include:

- Spills in loading/unloading areas.
- Deteriorated, damaged, leaking, or open containers.
- Failure or deterioration of secondary spill containment structures.
- Improper placement or stacking of drums.

The container and storage areas are inspected pursuant to the inspection form provided in Exhibit F-1. The results of each inspection are kept in a log file. An inspection form is provided for the inspector, and requires the inspector's name, date and time of inspection, items inspected, general status of area, non-compliance items and the date of repairs or remedial action taken to maintain the integrity of the containers. The hazardous waste inventory is treated as if a commodity for

manufacturing. Extreme care is taken to keep the inventory from being subject to harm or loss.

F.2.2.2 Tank System Inspection

Potential problems that could occur at or near the bulk liquid storage tank area include:

- Spills during loading and unloading of tanks.
- Structural failure of tanks or secondary containment.
- Failure or malfunction of operating equipment (i.e., pumps, valves, overflow devices).

Daily tank inspections are performed and recorded in accordance with the inspection schedule provided in Exhibit F-3. The level high control device (Exhibit F-7) for each tank will be tested annually in accordance with the manufacturer's recommendation. The process involves removing the level indicator probe that has an ultrasonic transducer located at the end. While the electrical wiring is still connected, the probe will be placed into a suitable container that is filled with water. Once this is done, the relay output should actuate. After the transducer is removed from the water, the relay output should deactuate. The high level alarm will be tested weekly by activating the high level test switch located near the system's control (annunciator) panel. The switch turns on the alarm and once the alarm sounds, the valve where the pump connects during operations should close. The Operations Manager or Process Manager maintains a tank inventory log. This log details the inventory, volumes in and out, and the origin or destination of the material. The inventory log is always checked and the fluid level in the tank verified prior to adding or removing liquids. An example log is presented in Exhibit F-5.

In addition to daily inspections, tanks are subject to inspections every 2 years and recertified by a professional engineer (PE). The tanks will be inspected according to the most recent American Petroleum Institute (API) 653 standards. Based on the recommendations of a Certified Professional Engineer, the frequency of these inspections may be reduced after sufficient data has been collected and a corrosion rate under typical use has been established. Each tank is emptied of all liquid and sludge to provide a thorough inspection of the tank. Each tank has a drain valve at the bottom and a

man way hatch on the side to assist in sludge and liquid removal. Areas to be inspected and potential problems are listed below:

Item	Inspection Procedures
Tank Wall Condition	Visually inspected for pitting or corrosion. If pitting or corrosion appears to jeopardize the integrity of the tank, arrangements will be made for ultrasound testing.
Roof of Tanks	Same as above.
Bottom of Tanks	Same as above.
Tank Welds	Seams and welds are visually checked for cracks, pitting, or corrosion.
Fittings and Valves	All fittings are removed disassembled and visually inspected. Packing and gaskets are replaced as needed.
Conservation Vents	Tested annually for operability and to ensure that field conditions are consistent with the calculations presented in this Application.

Any noncompliant waste issues are recorded, along with the appropriate corrections, the date, and the person responsible for the correction.

F.2.2.3 Laboratory Inspection

Potential problems that could occur in the laboratory include:

- Proper labeling of satellite accumulation waste.
- Proper disposal of cleanup materials.
- Proper operation of ventilation hood.

The laboratory is inspected pursuant to the example inspection form provided in Exhibit F-4. Any non-compliant issues are recorded, along with appropriate corrections, the date and the person responsible for the correction. The laboratory is used for conformance verification of wastes received at the facility and therefore contains small quantities of the wastes mixed with testing reagents.

F.3 PREPAREDNESS AND PREVENTION

A waiver from the preparedness and prevention requirements, 264.A (264 Subpart C) is not being requested pursuant to 270.A (270.14(b)(6)).

F.3.1 Equipment Requirements

F.3.1.1 Internal Communications

The facility uses a dual warning alarm system with specific signals to initiate evacuation of all plant areas in the case of fire or other extreme emergencies. Facility personnel are trained to recognize the alarms. The fire alarm is a “Tempura” sound and the hazardous materials incident alarm is a loud, continuous siren noise. Strobe lights are associated with the system; fire has a white strobe and hazardous materials, a yellow strobe. Strobes and horns are located throughout the facility, generally with a pull station, or activation switch, below the strobes and horns. Pull stations for a fire are bright red and pull stations for a chemical release are yellow. Each pull station is electronically identified such that when it is activated, its location is identified on the enunciator panel thus identifying the type of emergency and the location within the facility. The enunciator panels are located inside the administrative office and inside the fence at the west Lincoln Street gate. The alarm is electronically operated and is equipped with a battery back-up to insure

operation during a power outage. All employees are trained to know the location of the alarm activation switches as well as the meaning of each siren signal.

In addition to the alarm, the internal telephone system and public address system (PA) can be used to notify employees regarding the nature of any emergency and any recommended plans of action. Total plant evacuation is initiated only by an emergency coordinator or the activation of the alarm system.

The location of the phones (administrative office, plant, laboratory and Operations Manager's office), the warning alarms, and their initiation procedures are explained to all facility personnel.

F.3.1.2 External Communications

Telephones with internal and external lines are available at the facilities administrative office, laboratory and Operating Manager's office. The phone system has internal intercom, paging capabilities, and external access for emergency assistance. Figure F-1 presents the locations of the phones, paging speakers, alarm switches, and the alarm.

F.3.1.3 Emergency Equipment

Exhibit G-5 presents a list of the equipment maintained at the facility for the prevention, response to, and clean-up of spills, fires or other emergency events. Exhibit G-4 identifies the location of the identified safety and emergency equipment throughout the facility. Some emergency equipment requires more than a visual examination to assure it is in proper operating condition, these will be inspected as per local code (e.g., fire extinguishers, alarm system) and OSHA or manufacturers recommendations (e.g., SCBA units). Table F-1 presents the inspection schedule for emergency equipment. Exhibit F-2 presents an example of the inspection log for the emergency equipment performed on a weekly basis.

F.3.1.4 Fire Control Equipment

Figure F-1 indicates the location of the fire hydrants that would be used to extinguish a fire at the facility. The available water pressure at each hydrant is approximately 80 to 90 psi. The City of Phoenix Fire Department is the ultimate means to control fires at the facility.

In addition to the fire hydrants discussed above, multiple 25 pound hand held fire extinguishers are located throughout the facility. The fire extinguishers are strategically placed to be 50 feet or less travel distance to a storage area. Figure F-1 indicates the location of each of these extinguishers and Exhibit G-5 identifies the minimum quantity required on site. Facility personnel are trained in the use of hand held extinguishers and would use these extinguishers in the event of a small, localized fire.

Fire extinguishers, and spill response equipment are inspected on a weekly basis (see Exhibit F-2) or after use. If an incident requiring fire extinguishers occurs, the fire extinguishers are recharged or replaced as needed. All protective clothing is either disposed of or cleaned and repacked for future use. All respirators are checked, cleaned and replaced if necessary. All inventories of spill response materials, such as lime and bulk or prepackaged industrial absorbents are replenished. Any other equipment used during the emergency is examined and brought back to standard operating condition. Equipment used from the standard safety list will be checked and/or replaced. A list of equipment maintained at the facility for the prevention, response to, and clean-up of spills, fires or other emergency events is presented in Exhibit G-5.

The facility is protected with an automatic fire protection system in CSA I, II, the work stations, the maintenance area, and the administrative office. CSA I, the work stations, the maintenance area, and the administrative office are protected with a sprinkled water system that is activated by heat sensitive sprinkler heads. CSA II is protected by a foam suppression system that is activated by a heat sensitive fusible link wire and heat sensitive sprinkler heads. The fire suppression system is monitored through the same annunciator panels as the fire alarm system. A technical demonstration of the fire suppression system design is included in Appendix F-1. The technical demonstration, prepared by a qualified professional registered engineer, includes the standards of design, how the

system is activated, the rated system deliveries, and the retention capacities if the fire control system is activated.

F.3.2 Aisle Space Requirement

All areas of the plant have access from at least two directions in case of emergency. This allows spill control and fire fighting equipment access to the entire facility. Each container storage area has, or has been designed to have, a central aisle space sufficient to allow access by emergency equipment transported by forklifts. A minimum aisle spacing of two feet between rows of containers allow sufficient room for container inspection, fire protection, spill control equipment, and inspection of the containment area for the presence of leaks or spills. There is also adequate spacing to allow for the clean-up of any spilled material.

F.4 PREVENTIVE PROCEDURES, STRUCTURES, AND EQUIPMENT

F.4.1 Unloading Operations

Containers that are found to be leaking upon receipt at the facility entrance gate or at an unloading area are placed immediately in a drum-overpack or repaired if parts are easily replaced. Absorbent is used to collect any leaked material from the concrete containment pad and material is cleaned from the outside of the container itself.

F.4.1.1 Containers

Container loading/unloading operations are performed in designated areas. Containers are moved between the container storage areas, the loading/unloading area and/or the staging area. Typically, containers are moved via forklift, using pallets or drum grabbers. However other methods, such as drum dollies, hand trucks, brute force (i.e., tilting and rolling) etc. may be employed. Containers may also occasionally be transported on trailers pulled by forklifts.

Drummed materials are shipped to and from the facility by transport contractors. Hazardous waste transporters are registered with the U.S. EPA, US DOT and licensed by the Arizona Department of Transportation. Materials shipped from the facility include wastes sent to permitted hazardous waste treatment, storage, disposal or recycling facilities.

The loading dock allows forklifts to drive directly into a truck to load or unload containers. The forklifts will carry containers either on a pallet or using a drum grabber. Initial or final positioning of the container may employ the use of a hand truck and/or brute force.

Should a spill occur during routine operations absorbent material is readily applied (as is industrial grade lime, should acidic neutralization be required). Contaminated materials will be collected in an appropriate container, labeled, and shipped to an appropriate permitted facility for disposal or recycling. Affected areas of the site will be decontaminated. Any equipment used in the clean-up will be decontaminated or disposed of properly.

F.4.1.2 Tanker Trucks

Tanker truck loading is performed on the concrete pad in the designated loading area (see Figure B-1). The material is transferred to and from the truck through quick-couple hoses connected to valves. The pump, valves, and hose coupling are located inside a containment area. To minimize spilled material from leaving the containment area facility employees will supervise all loading operations. Any spill will be contained with absorbent material. Free liquids will be collected with a tank truck or diaphragm pump, if necessary. The absorbent would be collected in an appropriate container, labeled and transported to an appropriate permitted facility for proper disposal or recycling. Any spilled material recovered by a pump or truck will also be properly disposed or recycled.

All hose-to-hose and hose-to truck couplings use cam-lock couplings. Cam-lock couplings arms will be secured in position using duct tape or similar type devices to prevent the accidental opening

of the coupling during liquid transfer. A drip pan will be placed beneath each coupling to collect any liquid that may drip from the coupling during the coupling process. While drips may be expected during attachment and detachment, any hose that leaks during liquid transfer will be repaired or removed from service and replaced. The tank truck loading/unloading area is a containment area sufficient to contain the total volume of a tanker truck. In addition, all hoses and couplings will be within a secondary containment area during all unloading/loading operations.

Each bulk transport load is sampled prior to unloading. Waste acceptance procedures sufficiently identify the waste to prevent the mixing of incompatible wastes. Once the material is approved, under the direction of the supervisor, the waste is unloaded into the appropriately designated tank. The available volume of the tank will be confirmed prior to unloading, to insure the tank will not be overfilled.

Should a spill occur during loading/unloading operations, absorbent material, diaphragm pumps and/or tank trucks are available for clean-up. Contaminated materials are placed in drums and labeled or pumped into tanks to be either recycled or disposed of at an EPA approved hazardous waste facility. All affected areas and any equipment used in the clean-up will be decontaminated. The unloading areas are constructed of concrete, to prevent spills or hazardous materials from contaminating the soil.

F.4.2 Run-off

Run-off from the waste storage areas is controlled by several means. Waste management units are provided with bermed concrete secondary containment to control run-off. A collection area in the truck unloading area prevents any precipitation run-off as well as retaining any residuals or spilled material. Rainwater in the tank farm, tanker loading/unloading area, storage areas, and outside container storage areas are collected in a dedicated rainwater tank located in the tank farm for either evaporation on site or disposal offsite. The collected rainwater will be tested, and depending on test results and compliance with each option, be shipped to an approved facility for proper disposal, sent offsite for discharge to the POTW, or released to the storm drain system. Rainwater collected in the

work stations or the covered container storage areas is drummed for disposal offsite.

Rainwater is removed from any containment area containing RCRA waste in as timely a manner as necessary to prevent overflow of the containment area. If any RCRA waste is present in the tank farm, accumulated precipitation in the tank farm will be removed within 24 hours after a rain event ceases on a routine business day. Rainwater in open containment areas, such as the tanker loading/unloading area, is removed prior to any activities that may create a potential for contamination. Rainwater in each open containment area is observed for signs of contamination, e.g., visible sheen, discoloration, etc. prior to being mixed with the rainwater in the accumulation rainwater tank. If any contamination is suspected, the water is segregated from the remainder of the collected water.

Rainwater is collected at the low point of the active portion of the facility for any surface flow or overflow for outside containment areas. The low point has a locked closed valve that will only be opened after analysis has been performed on the water and the water meets the standards for NPDES storm water discharge limits. When the water is released from the low point valve, it must pass through another valve, that is kept locked and closed, prior to discharging into the storm drain system.

F.4.3 Water Supplies

The hazardous waste management units and the staging area are constructed of concrete and sloped or otherwise contained such that no hazardous material will be allowed to migrate off site or into site soils. Storage areas have a chemically resistant sealant applied to the concrete to prevent migration of wastes through the concrete. Any spills or leaks will be immediately cleaned up to prevent migration of hazardous constituents into or through the concrete. By preventing the migration of hazardous materials off site or into site soils, the possibility of impacting a water supply is negligible.

In the unlikely event that a spill should migrate outside a containment area, and threaten to leave the

facility, procedures will be immediately implemented to prevent waste materials from entering the nearby storm drains located at the northeast corner of 15th Avenue and Lincoln Street. Earthen or absorbent dikes will be constructed to contain the waste. All free liquids will be removed from the diked area. After all danger of waste entering the storm drain has passed, the dikes will be removed and packed for shipment to an appropriate permitted facility. The area will be appropriately decontaminated after all waste has been removed.

F.4.4 Equipment and Power Failure

A power failure will not significantly affect the storage or loading/unloading operations at the facility. All equipment used in these operations is either self-propelled or manual. The forklifts used for moving drums are fueled by propane gas. The access gates to the facility are battery operated or may be operated manually.

The facility has several forklifts on-site, allowing quick and easy replacement should a breakdown occur with any particular vehicle. A hand truck may be used in an emergency.

Operations in the processing area will be limited in the event of a power failure. A power failure will also impact after dark operations, lighting, and to a lesser degree, pumping. Currently, primarily air operated pumps are used for liquid transfer. In the event of a long term power failure, a mobile air compressor could be used to transfer liquids between vessels.

Valves in the processing area are manually operated which will allow operations during periods of power outages. The pneumatic equipment will begin to slow down with a power outage rather than completely stopping, allowing sufficient time to discontinue the pumping operations by closing appropriate valves and draining the hoses until the power is restored. Valves at both ends of the transfer hose will be closed and all operating switches will be shut off. If a lengthy power outage is expected and hoses must be disconnected, valves at each end of the hose will be double checked to ensure that they are closed. When appropriate, bleed valves will be used to drain the contents of the hose into a container. If necessary, multiple containers will be used. The containers will be marked

and labeled appropriately and stored in the appropriate container storage area.

Bulk tank trucks are normally loaded and unloaded at the facility with portable air-driven pumps equipped with 2 to 4-inch diameter hoses. Air pressure is provided to these pumps by an electric air compressor. A power outage would interrupt transfer operations until a mobile rental air compressor could be obtained or electrical power restored.

If a power outage occurs, while using electrically driven transfer pumps, the operating switch will be turned off and appropriate valves closed to prevent any possible release of waste to the environment. Pumping operations have facility personnel in attendance to monitor for equipment or power failure and to take appropriate actions as needed.

If pump failure occurs, valves at both ends of the transfer hose will be closed and all operating switches will be shut off. Bleed valves will then be used to drain the contents of the pump into a container. If necessary, multiple containers will be used. The containers will be appropriately marked and labeled prior to storage in the appropriate container storage area. The failed pump will then be repaired or replaced and operations will resume.

The facility maintains a minimum of three portable emergency lights that each provides three hours of light. The emergency lights are battery operated and their operation is included as an item on the inspection checklist. In addition, the forklifts and other vehicles have lights that last indefinitely to allow completion of emergency operations and securing of the facility.

The alarm system contains a battery back-up power source. The performance of the batteries is monitored internally within the alarm system. If the batteries should begin to fail, the control panel will display the issue and emit an audible tone to alert office personnel. The control panel is monitored at least weekly on the Safety and Security weekly inspection. An outside contractor performs an annual inspection on the alarm system which includes checking the status of the back-up battery source.

F.4.5 Personal Protective Equipment

All personnel at the facility are trained in proper procedures for handling hazardous wastes; performing facility operations and responding to emergency situations (also see Section H). Personnel are protected from unwarranted exposure to hazardous wastes in several ways. Wastes are accepted and shipped only in U.S. DOT approved containers for the type of waste present in the container. Direct contact with containers is minimized through the use of drum handling equipment. Forklifts are equipped with operator cages and seat belts to protect the operator in the event of a collision with equipment or a structure.

While conducting hazardous waste management operations, including drum sampling, loading/unloading, spill cleanup or waste transfer, facility personnel are required to wear, at a minimum, the following personal protective equipment (PPE): safety glasses with side shields or face shields, and steel-toed boots. In addition, each employee will have their own individual respiratory protection device which is available for use at all times and is mandatory under circumstances which require respiratory protection. Both carbon canister respirators and supplied air respirators are available on-site. All yard employees are issued and must wear appropriate chemically resistant gloves, coveralls and/or aprons and safety equipment during all hazardous waste management operations including sampling, bulk vehicle loading or unloading, and working in the vicinity of any waste spills or clean-up operations. There are also full body protective suits that are acid and solvent resistant for emergency responses to major spills.

Safety showers and eyewash units are located at strategic points throughout the facility (see Figure F-1) in the event of direct contact with wastes.

All visitors must register at the office and receive safety instructions and equipment (e.g., hard hat, safety glasses) before being accompanied by a facility employee into the active portion of the facility.

F.4.6 Releases to the Atmosphere

The waste storage, container and tank loading and unloading areas are constructed of concrete and bermed to minimize any run-off or potential contamination of the soil or groundwater. Personnel are trained to clean-up spills as quickly as possible to minimize the spread of contaminants on site and the release of vapors to the atmosphere. In the event of a large release or spill, the facility's contingency plan would be implemented. The facility Contingency Plan is presented in Section G.

While the liquid is being removed from the drum during normal pumping operations, air will flow into the drum replacing the liquid volume. The influx of air into the drum will minimize vapor emissions.

To prevent the release of vapors during routine operations, all tanks are closed top tanks with back pressure devices. Venting from these is through an emissions control system.

F.5 PREVENTION OF REACTION OF IGNITABLE, REACTIVE AND INCOMPATIBLE WASTES

F.5.1 Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Wastes

The potential primary source of ignition to the containers is external. To prevent a possible source of ignition, drums containing ignitable or reactive wastes are located at a distance greater than 50 feet from the perimeter fence. The main entry gates into the yard are marked with signs reading

"DANGER - UNAUTHORIZED PERSONNEL KEEP OUT"

and

"DANGER - NO SMOKING or OPEN FLAMES".

Sources of open flames or ignition are not permitted in any of the storage areas unless authorized by the Facility, Operations, or Compliance Manager. If the use of an open flame is necessary,

flammable materials will be moved a safe distance away from the planned operation and the established company procedures followed to monitor for flammable gas vapors. A handheld fire extinguisher will be in close proximity to the operations.

Spark resistant tools will be used when ignitable or reactive wastes are transferred between vessels. Bonding and grounding procedures are employed along the path of fluid movement, container to tank or tank to tanker, to prevent the creation of static sparks that could ignite vapors from the flammable liquids being transferred. Equipment and practices used follow NFPA standards for the transfer of ignitable wastes.

A ground plane system throughout the entire facility connects structures and equipment to a common ground equalizing the electrical potential to prevent a source of ignition caused by an electrostatic discharge. The ground plane system consists of a permanent bonded electrical conductor buried beneath the concrete that connects to the tanks, the buildings, and the electrical panels. Static bonding cables are utilized between vessels during fluid transfer operations which are connected to the ground plane system at various connection points around the facility. The grounding points for the bonding cables are included as inspection items in the example inspection forms provided in the exhibits.

The electrical design standards of the facility correspond to NFPA 70, the National Electrical Code, for the classification of electrical areas and constructed to the standards applied to each of the areas.

Heat sensitive materials are screened in the profile process from being approved for acceptance at the site. All waste stored at the facility is at ambient temperature. Any waste that is thermally unstable at ambient temperatures is not considered an acceptable waste at the site and is rejected during the profile process.

The City of Phoenix Fire Department has recognized that any water reactive materials coming to the site are lab pack quantities that will be shipped in DOT approved containers that are waterproof. Because the Fire Department understands the packaging requirements, they will allow water

reactive materials to be stored in storage areas with automated sprinklers. The facility also utilizes rain-tight secondary containment pallets for storage in CSA's IV, VI, and VII.

F.5.2 General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Wastes

The general precautions for handling ignitable wastes as defined by 40 CFR 261.21 were discussed in the previous section. No reactive wastes as defined by 40 CFR 261.23 are bulked or mixed at the facility.

As discussed in Section C, Waste Analysis Plan, the facility analyzes waste to identify the compatibility of these wastes before placing them into bulk storage tanks. Wastes are stored only in tanks designated for specific types of wastes (i.e., solvents or aqueous organics). Procedures dictate that the compatibility bucket test be performed on a sample of the incoming waste be mixed with a sample of the material in the receiving tank. The site Laboratory Manager or his designee evaluates the results to determine if heat or gas is produced during mixing. Mixing operations may proceed after the site Operations Manager or designee has approved the waste in accordance with the facility's waste analysis plan.

F.5.3 Management of Ignitable or Reactive Wastes in Containers

Precautions taken in the container storage area to prevent accidental fire and explosion include: proper storage of containers (i.e., stacking, labeling, and sealing of containers), dikes, appropriate warning signs, and inspection for container structural integrity. Waste generators are instructed to fill drums with no more than 50 gallons to leave sufficient head space for expansion.

Each container is checked to see that it is properly sealed and labeled as part of the verification process for the proper placement in a specified storage area. EPA label requirements specify waste name, generator ID number, and manifest document number be on every drum. No drums are received without these minimum requirements.

Drums are never stacked taller than the equivalent of two 85 gallon containers. Ignitable or reactive wastes, with EPA waste codes D001 and D003 respectively, stored throughout the facility are located a minimum of 50 feet from the nearest property line. The flammable tanks in the tank storage area also are located a minimum of 50 feet from the nearest property line.

No containerized flammable wastes are stored in Container Storage Area 1. There are no electrical outlets inside the tank storage areas. There are no other sources of ignition in these areas.

F.5.4 Management of Incompatible Wastes in Containers

Incompatible wastes are not stored together at the facility. Incompatible wastes are stored in separate secondary containment areas within storage areas. Small volumes of incompatible materials may be stored on individual portable secondary containment pallets. Since lab packs, by definition, have their own containment, incompatible lab packs may be separated by aisle space.

F.5.5 Management of Ignitable or Reactive Wastes in Tanks

Each bulk tanker load of ignitable hazardous waste received is sampled and the compatibility bucket test is performed prior to being placed in the appropriate storage tank to prevent the potential mixing of incompatible materials.

Precautions taken in the tank farm area to prevent accidental fires and explosions include correct fitting gaskets in the transfer lines, appropriate NFPA warning signs, signage that describes the type of liquid in the tank, and enclosed, direct tanker-to-tank transfer of flammable liquids. All lines used in the transfer process are grounded. Section G, the Site Contingency Plan, details emergency response for large spills. The facility has provided the City of Phoenix Fire and Police Departments and other emergency response organizations with the site contingency plan to familiarize them with the facility operations. The Fire Department, the primary emergency responder, has inspected the site.

F.5.6 Incompatible Wastes in Tanks

Only waste streams, which are compatible, will be stored in the same tank. Compatibility testing (compatibility bucket test) will be conducted as part of the waste acceptance procedure upon receipt of the waste. Section C, Waste Analysis Plan provides a more complete discussion of waste acceptance and waste conformance procedures. The mixture will be monitored to ensure that no adverse reaction occurs. If laboratory testing indicates that the wastes are not compatible, several options are available:

- the incoming waste can be stored in a separate tank;
- the waste can be rejected back to the generator;
- the waste can be rejected to an alternate TSDF; or
- if the waste is multiple containers, the drum(s) that create the incompatible reaction can be removed from the pumping schedule.

Upon the laboratory determination, explicit directions will be given to the material handlers performing the pumping operations. Any containers deemed incompatible will be removed from the pump line up prior to commencing any pumping operations. Connections, hoses, materials to pump, and receiving vessel are double checked by a supervisor prior to commencing pumping operations.

Each tank will be dedicated to the storage of liquids within the sample compatibility group. Incompatible wastes will not be introduced until the tank has gone through a decontamination process.

TABLE F-1

EXAMPLE INSPECTION SCHEDULE AND PROCEDURES

TABLE F-1

INSPECTION SCHEDULE AND PROCEDURES

Area or Equipment	Examples or Evidence of Potential Problem	Inspection Frequency	Inspection Procedure
SECURITY			
Fences	Holes or other damage	Daily	Visual
Gates	Closed, missing locks damage	Daily*	Visual
Warning Signs	Missing, damaged, faded	Weekly	Visual
Intercom/Telephone System	Inoperative, unintelligible	Weekly	Usage
TRAFFIC AREAS			
Road surfaces	Cracks, breakage	Daily	Visual
Fork lift	Poor working condition	Weekly	Visual
CONTAINER STORAGE AREAS			
Containers	Corrosion, leaks, bulges loose rings, bungs, or seals incorrect, faded or illegible labels, date received should not exceed 9 months	Daily	Visual
Secondary Containment	Cracks or damaged base or dikes	Daily	Visual
Aisle space	Inadequate or blocked aisles	Daily	Visual
Container Segregation	Improper Storage of Incompatible wastes No D001 or D003 in CSA V	Daily	Visual
Pallets	Properly loaded, stacked, clean, good condition	Daily	Visual
Tank Shell (external)	Corrosion, leaking, blisters, properly closed	Daily	Visual

**TABLE F-1
(Continued)**

Area or Equipment	Examples or Evidence of Potential Problem	Inspection Frequency	Inspection Procedure
TANK FARM			
Hoses, Pipes, Fittings, and Cords	Removed, damaged, leaking, properly closed	Daily / Weekly*	Visual
Flooring	Cracks, Deterioration, wet spots	Daily	Visual
Pumps	Leaking, damage Inoperative	Daily / Weekly*	Visual
Drip Pans	Accumulation of liquids or absorbents	Daily	Visual
TANK FARM LOADING/UNLOADING AREAS			
Dikes/Walls	Cracks, deterioration	Daily	Visual
Bases/Foundations	Cracks, spalling, uneven settlement, erosion, wet spot	Daily	Visual
Warning Signs	Damaged, missing	Weekly	Visual
Pumps, Mixers, and Scrubbers	Power, clogging	Daily	Visual
Pipes, Valves, and Fittings	Leaks, corrosion or deterioration	Daily/ Weekly	Visual
SAFETY AND EMERGENCY EQUIPMENT			
Supplies	Inventory depleted	Weekly	Visual
Tools	Damaged, missing	Weekly	Visual
Compressor (portable)	Fuel, hoses missing, poor working order	Weekly	Visual
Static lines	Missing or broken	Weekly	Visual

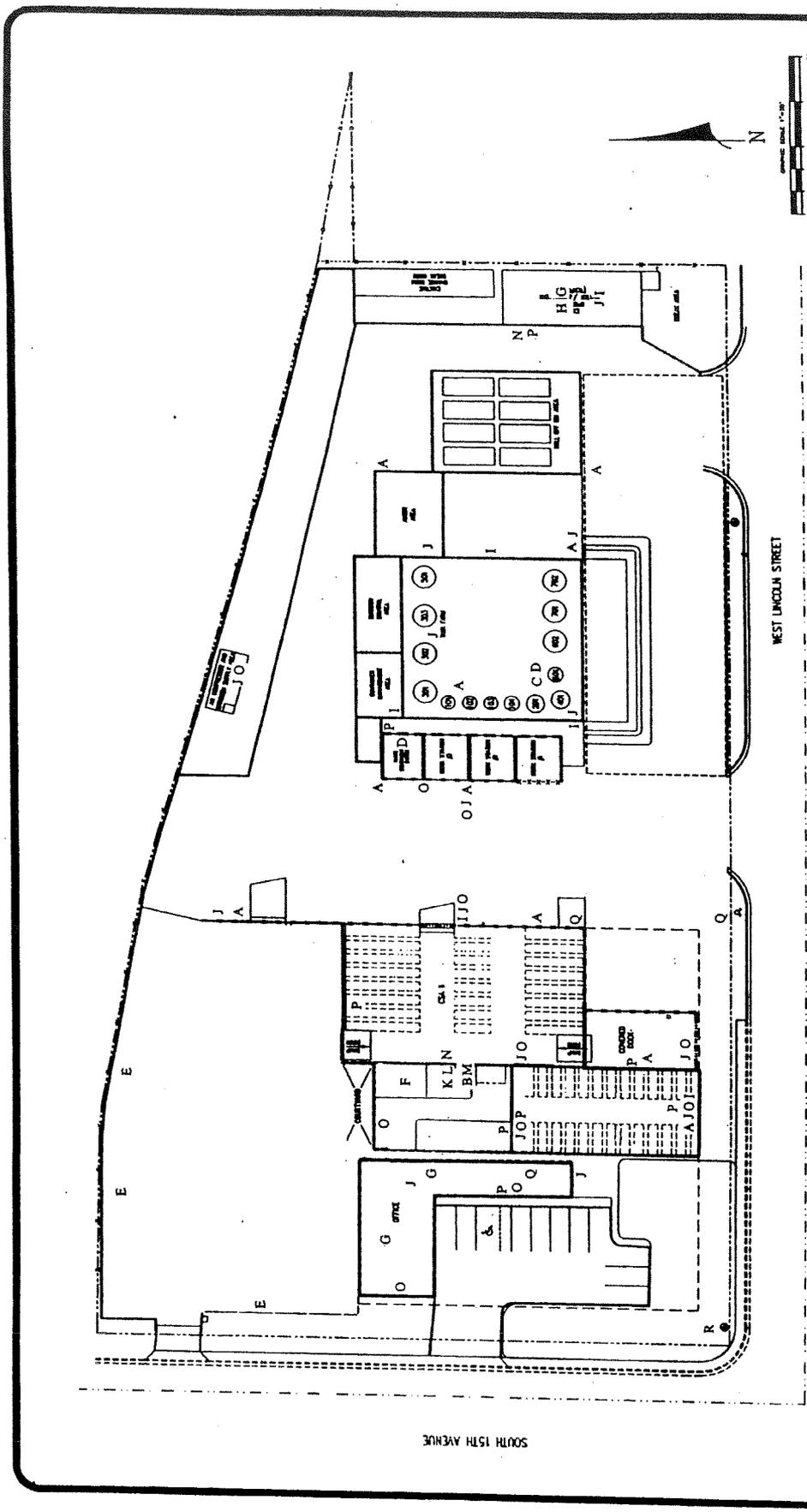
**TABLE F-1
(Continued)**

Area or Equipment	Examples or Evidence of Potential Problem	Inspection Frequency	Inspection Procedure
SAFETY AND EMERGENCY EQUIPMENT (Continued)			
Emergency Lights	Burned out bulbs, electrical	Weekly	Visual
Fire extinguishers	Need recharging Professionally	Weekly/ Annually	Visual
Fire alarm	Out of service	Weekly	Visual
Emergency shower	Not working properly	Weekly	Visual
WASTE CONSOLIDATION UNIT			
Operation	Unusual noises, bent or broken fixtures, leaking fluids	Weekly*	Visual
Supply Cylinders	Pressures within operating ranges	Weekly	Visual
Emissions Systems	Loose connections and proper operation	Weekly	Visual
Cleanliness	Spilled or leaking waste in vicinity	Daily	Visual
Secured	Opened doors and panels	Daily	Visual
WORK STATIONS			
Bases/foundation	Cracks, breakage	Daily	Visual
Coatings	Chipping, cracking, peeling	Daily	Visual
Sumps	Cracks, spalling, fluid	Daily	Visual
Pipes/valves	Leaks, corrosion	Daily*	Visual
Warning signs	Faded or missing	Weekly	Visual
Containers	water reactives in rainproof Storage vessel	Daily	Visual

* Indicates that equipment will be checked both prior to use and during operation.

FIGURE F-1

SAFETY EQUIPMENT LAYOUT



Clean Harbors Arizona
 SAFETY EQUIPMENT LAYOUT
 1340 West Lincoln Street
 Phoenix, AZ 85007

- | | | |
|------------------|------------------------------|---------------------------|
| A - absorbent | G - emergency lights | M - emergency phone |
| B - neutralizer | H - first aid supplies | N - P. A. speakers |
| C - hoses | I - emergency eyewash/shower | O - alarm pull stations |
| D - static lines | J - fire extinguishers | P - alarm warning centers |
| E - supply drums | K - blower | Q - annunciator panels |
| F - PPE supplies | L - SCBA's | R - fire hydrant |

EXHIBIT F-1

EXAMPLE CONTAINER STORAGE AREA INSPECTION FORM



CONTAINER STORAGE AREA INSPECTION FORM

FormCode

Full Name: Abraham Yohannes	Date: 6/23/2009				
Location: CSA 1	Military Time: 7:40:00 AM				
Instructions: Note condition of inspection items. If item does not apply to an area, mark N/A. All unsatisfactory findings must be explained below. Include any repairs, changes or other remedial actions required or performed.					
INSPECTION ITEM	YES	NO	N/A	REASON FOR FAILURE	WORK TICKET STAT
Container Placement and Stacking	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Sealing of Containers	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Labeling of Containers	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Containers	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Pallets	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Doors (indoor area)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Base / Foundation / Roof	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Berms / Racks	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Debris and Refuse	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Warning Signs	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		

Aisle Space	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Loading and Unloading Areas	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Sumps	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Alarm and Communication System	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Storage Capacity	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Bonding / Grounding	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>		
<input type="text"/>					
Pumps	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>		
<input type="text"/>					
Inventory Age	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
On-Demand Work Ticket (please describe reason below)					
<input type="text"/>					
Select Overall Assessment of Inspection Results	<input type="text" value="Pass"/>				

Supervisor's Signature _____

EXHIBIT F-2

EXAMPLE SAFETY AND SECURITY INSPECTION FORM



SAFETY & SECURITY INSPECTION FORM

FormCode

Full Name:	paul steber	Date:	5/24/2009
Location:	Phoenix Facility	Military Time:	4:45:00 AM

Instructions: Note condition of inspection items. If item does not apply to an area, mark N/A. All unsatisfactory findings must be explained below. Include any repairs, changes or other remedial actions required or performed.

INSPECTION ITEM	YES	NO	N/A	REASON FOR FAILURE	WORK TICKET STAT
Perimeter Fences	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Gates	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Warning Signs	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Exit Signs	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Exits / Firelanes / Evacuation Routes Clear?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Lighting System	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Emergency Lighting System	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Accessibility of Safety Equipment/Protective Gear (helmets, faceshields,goggles,boots,gloves,clothing,duct tape, ab. pads)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Adequate Supply of Safety Equipment/Protective Gear	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Condition of Safety Equipment/Protective Gear	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		

Breathing Apparatus Accessibility	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Breathing Apparatus Adequate Supply/Full Charge	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Breathing Apparatus Condition	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
First Aid Kits	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Blood Borne Pathogen Kits	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Emergency Eyewashes	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Emergency Showers	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Internal/External Communications (Phones/Radios)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Fire Extinguishers	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Absorbent Supply	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Recovery Drum Supply	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Respirators and Cartridges	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Fire Suppression System (monitors, pull stations, alarms) Accessibility	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Fire Suppression System Operable?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					

Water Lines / Hydrants	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="text"/>					
Alarm Systems	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="text"/>					
Fire Blankets	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<input type="text"/>					
Strainers on Fire Suppression System	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="text"/>					
Surveillance System/Guard Service	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="text"/>					
Supplied Air Delivery System and Reserve	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="text"/>					
Wind Sock	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="text"/>					
Decontamination Equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="text"/>					
Portable Sump Pumps	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="text"/>					
Gasoline Pumps	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<input type="text"/>					
Loud Speakers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="text"/>					
Chocked Wheels on Parked Vehicles	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="text"/>					
Cylinders Secure	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="text"/>					
Ventilation Operable	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="text"/>					

Fall Protection	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Electrical Boxes	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Emergency Contact Info Posted	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Hearing Protection Available	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Housekeeping	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Portable Compressor	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>		
<input type="text"/>					
Lime Supply	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
QC Lab Hood	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Rolloff Parking Area	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Dumpster / Outside Containers	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Stormwater Collection System	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Rally Point	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Visitors Log	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Contingency Plan	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					

Wind Instrument	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>		
<input type="text"/>					
On-Demand Work Ticket (please describe reason below)					
<input type="text"/>					
Select Overall Assessment of Inspection Results	<input type="text" value="Pass"/>				

Submit

Supervisor's Signature _____

EXHIBIT F-3

EXAMPLE TANK SYSTEM INSPECTION FORM



TANK SYSTEMS INSPECTION FORM

FormCode PHCMPFRM04

Full Name:	<input type="text"/>	Date:	<input type="text"/>
-------------------	----------------------	--------------	----------------------

Location:	<input type="text"/>	Military Time:	<input type="text"/>
------------------	----------------------	-----------------------	----------------------

Instructions: Note condition of inspection items. If item does not apply to an area, mark N/A. All unsatisfactory findings must be explained below. Include any repairs, changes or other remedial actions required or performed.

INSPECTION ITEM	YES	NO	N/A	REASON FOR FAILURE	WORK TICKET STAT
Tanks	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Pipes	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Valves	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Fittings	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Liquid Level	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Secondary Containment	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Sumps	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Bonding and Grounding	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Transfer Equipment (pumps, filters, strainers, hoses)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Communication and Alarm System	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					

Satellite Accumulation Containers (filter/basket, solids, etc.)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Manways, Hatches, Other Openings	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Pressure Relief Valves (PRV)/Flame Arrestors	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Tanks marked with the words "HAZARDOUS WASTE"	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Tanks not used marked "OUT OF SERVICE"	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Tanks Marked as to Contents (NON-HAZ ONLY)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Monitoring Equipment (Pressure/Temperature Guages, Level Indicators)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Overfill Controls Operational?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Loading / Unloading Areas	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
On-Demand Work Ticket (please describe reason below)					
<input type="text"/>					
Select Overall Assessment of Inspection Results	<input type="text" value="Pass"/>				

Supervisor's Signature _____

EXHIBIT F-4

EXAMPLE LABORATORY INSPECTION FORM



LABORATORY INSPECTION

FormCode

Full Name:	Abraham Yohannes	Date:	6/23/2009		
Location:	Laboratory	Military Time:	7:55:00 AM		
Instructions: Inspections must be conducted daily when the facility is in operation. Note condition of inspection items. If item does not apply to an area, mark N/A. All unsatisfactory findings must be explained below. Include any repairs, changes or other remedial actions required or performed.					
INSPECTION ITEM	YES	NO	N/A	REASON FOR FAILURE	WORK TICKET STAT
Surveillance System - Check for operation (24 hr. guard service)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Alarm System - Check accessibility	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Internal (phone & radio) and External (phone) Communications - Check accessibility	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Internal (phone & radio) and External (phone) Communications - Check operaton	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Container Storage Area: Accumulation & Satellite - Check for damaged containers	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Container Storage Area: Accumulation & Satellite - Check for evidence of spilled material	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Container Storage Area: Accumulation & Satellite - Check for 90 day accumulation date	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Container Storage Area: Accumulation & Satellite - Check for adequate aisle space	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Container Storage Area: Accumulation & Satellite - Check for proper labeling	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Sample Disposal System: Observe if proper procedures are in use	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		

Sampling Equipment: Check for proper decontamination procedures	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Sampling Equipment: Check for disposal of cleanup materials in proper containment	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Sampling Equipment: Check for improper placement	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
Ventilation/Hooding System: Check operability	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<input type="text"/>					
On-Demand Work Ticket (please describe reason below)					
<input type="text"/>					
Select Overall Assessment of Inspection Results	<input type="text" value="Pass"/>				

Supervisor's Signature _____

EXHIBIT F-5

EXAMPLE TANK INVENTORY LOG

Tank Contents By Drum Report

ENVIRONMENTAL SERVICES Plant:

Drum No.	Generator	Qty Pumped	Qty UOM	Activity Dt	Out of Service Dt	PCB Type	Restriction
17717602	Hexcel Corporation (HE000014)	55	GALS	6/16/2009			
17913393	Freeport-McMoRan-Central Analytical Service Center (FR1228)	30	GALS	6/16/2009			
17984775	Freeport-McMoRan - Tyrone (PHE0435)	30	GALS	6/16/2009			
17984776	Freeport-McMoRan - Tyrone (PHE0435)	55	GALS	6/16/2009			
18074141	Mandall Armored Barrier Systems Incorporated (MA6783)	55	GALS	6/16/2009			
18074142	Mandall Armored Barrier Systems Incorporated (MA6783)	55	GALS	6/16/2009			
18169606	Northwest Medical Center (NO2530)	55	GALS	6/16/2009			
18186767	Affiliated Laboratories (AF0063)	30	GALS	6/16/2009			
18186768	Affiliated Laboratories (AF0063)	30	GALS	6/16/2009			
18272680	Bostwick Laboratories (BO0990)	55	GALS	6/16/2009			
18284673	Bostwick Laboratories (BO0990)	55	GALS	6/16/2009			
18370034	Great Organization The (TH1095)	55	GALS	6/16/2009			
18377838	Bostwick Laboratories (BO0990)	55	GALS	6/16/2009			
18380311	Bose Corp Av Miguel De La Mad (BOS1145)	55	GALS	6/16/2009			
18389329	Fluoresco Sign Co (FL0768)	55	GALS	6/16/2009			
18389330	Fluoresco Sign Co (FL0768)	55	GALS	6/16/2009			
18404928	Michael L Riddle Painting Inc (MI3493)	55	GALS	6/16/2009			
18404929	Michael L Riddle Painting Inc (MI3493)	55	GALS	6/16/2009			
18404950	Affiliated Laboratories (AF0063)	30	GALS	6/16/2009			
18404951	Affiliated Laboratories (AF0063)	30	GALS	6/16/2009			
18422140	Owl'S Auto Body (OW0217)	55	GALS	6/16/2009			
18422154	KC Auto Paint (YA0826)	30	GALS	6/16/2009			
18422157	Superior Industries (SU1364)	55	GALS	6/16/2009			
18422158	Superior Industries (SU1364)	55	GALS	6/16/2009			
18422159	Superior Industries (SU1364)	55	GALS	6/16/2009			
18422161	Superior Industries (SU1364)	55	GALS	6/16/2009			
18424675	Arizona State University (ARI0624)	55	GALS	6/16/2009			Yes
18424676	Arizona State University (ARI0624)	55	GALS	6/16/2009			Yes
18424677	Arizona State University (ARI0624)	55	GALS	6/16/2009			Yes
18424678	Arizona State University (ARI0624)	55	GALS	6/16/2009			Yes
18424679	Arizona State University (ARI0624)	55	GALS	6/16/2009			Yes
18428299	Bostwick Laboratories (BO0990)	55	GALS	6/16/2009			

Report Printed On: 6/23/2009 3:30:33 PM

Tank Contents By Drum Report

#MIRBMMFHT21 SERVICES Plant:

Drum No.	Generator	Qty Pumped	Qty UOM	Activity Dt	Out of Service Dt	PCB Type	Restriction
18428332	Flow Technology (FL0772)	55	GALS	6/16/2009			
18428333	Flow Technology (FL0772)	55	GALS	6/16/2009			
18428334	Flow Technology (FL0772)	55	GALS	6/16/2009			
18428335	Flow Technology (FL0772)	55	GALS	6/16/2009			
18434700	Jill A Cohen Md Pc (JI0088)	55	GALS	6/16/2009			
18441529	Honeywell Aerospace Svc (HO2368)	55	GALS	6/16/2009			
18441530	Honeywell Aerospace Svc (HO2368)	55	GALS	6/16/2009			
18441531	Honeywell Aerospace Svc (HO2368)	55	GALS	6/16/2009			
18441532	Honeywell Aerospace Svc (HO2368)	30	GALS	6/16/2009			
18441537	Honeywell Aerospace Svc (HO2368)	55	GALS	6/16/2009			
18446602	Bostwick Laboratories (BO0990)	55	GALS	6/16/2009			
18462103	Precision Deburring (PR2351)	55	GALS	6/16/2009			
18462104	Precision Deburring (PR2351)	55	GALS	6/16/2009			
18472337	St Joseph's Hospital (ST2862)	55	GALS	6/16/2009			
18472338	St Joseph's Hospital (ST2862)	55	GALS	6/16/2009			
18474911	Dial Corporation (DI0962)	10	GALS	6/16/2009			
18483497	Bostwick Laboratories (BO0990)	55	GALS	6/16/2009			
18536307	Kronos Science (KR0258)	55	GALS	6/16/2009			
18543191	L3 Communications (LI0855)	1,934	GALS	6/12/2009			

Tank No.: 301	Tank Dscrpn: FUEL/LEANWATER	Capacity: 9498	Current Vol: 3,427.00	Clean Date:	Wst Class: FB1
Total Drums: 51	Total Qty: 4,439				

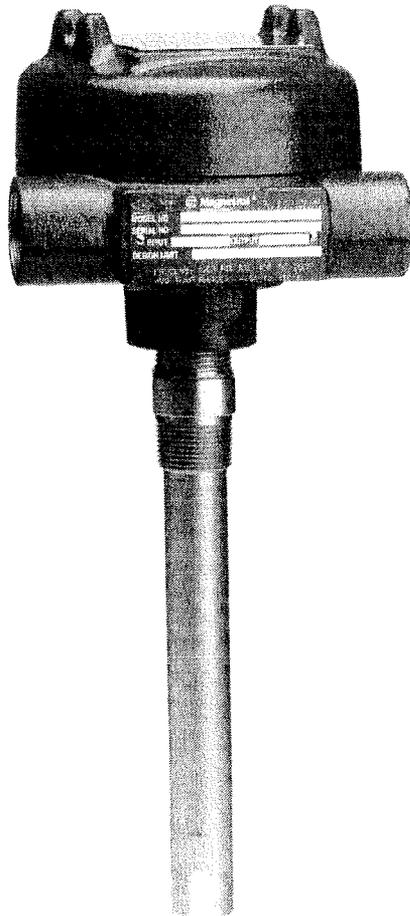
Section F
Revision No. 11
Date: 07/30/09

EXHIBIT F-7

ECHOTEL Model 910 ULTRASONIC LEVEL SWITCH

Echotel® Model 910

Installation and Operating Manual



*Ultrasonic
Level
Switch*

Read this Manual Before Installing

This manual provides information on the Echotel Model 910 Ultrasonic Liquid Level Switches. It is important that all instructions are read carefully and followed in sequence. Detailed instructions are included in the Installation section of this manual.

Conventions Used in this Manual

Certain conventions are used in this manual to convey specific types of information. General technical material, support data, and safety information are presented in narrative form. The following styles are used for notes, cautions, and warnings.

Notes

Notes contain information that augments or clarifies an operating step. Notes do not normally contain actions. They follow the procedural steps to which they refer.

Cautions

Cautions alert the technician to special conditions that could injure personnel, damage equipment, or reduce a component's mechanical integrity. Cautions are also used to alert the technician to unsafe practices or the need for special protective equipment or specific materials. In this manual, a caution box indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Warnings

Warnings identify potentially dangerous situations or serious hazards. In this manual, a warning indicates an imminently hazardous situation which, if not avoided, could result in serious injury or death.

Safety Messages

The Echotel Model 910 is designed for use in Category II, Pollution Degree 2 installations. Follow all standard industry procedures for servicing electrical and computer equipment when working with or around high voltage. Always shut off the power supply before touching any components. Although high voltage is not present in this system, it may be present in other systems.

Electrical components are sensitive to electrostatic discharge. To prevent equipment damage, observe safety procedures when working with electrostatic sensitive components.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

WARNING! Explosion hazard. Do not connect or disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

Low Voltage Directive

For use in Category II installations. If equipment is used in a manner not specified by manufacturer, protection provided by equipment may be impaired.

Notice of Trademark, Copyright, and Limitations

Echotel is a registered tradename of Magnetrol International.

Copyright © 2005 Magnetrol International, Incorporated. All rights reserved.

Magnetrol/STI reserves the right to make changes to the product described in this manual at any time without notice. Magnetrol/STI makes no warranty with respect to the accuracy of the information in this manual.

Warranty

All Magnetrol/STI Model 910 Level Switches are warranted free of defects in materials or workmanship for two full years from the date of original factory shipment.

If returned within the warranty period; and, upon factory inspection of the control, the cause of the claim is determined to be covered under the warranty; then, Magnetrol/STI will repair or replace the control at no cost to the purchaser (or owner) other than transportation.

Magnetrol/STI shall not be liable for misapplication, labor claims, direct or consequential damage or expense arising from the installation or use of equipment. There are no other warranties expressed or implied, except special written warranties covering some Magnetrol/STI products.

Quality Assurance

The quality assurance system in place at Magnetrol/STI guarantees the highest level of quality throughout the company. Magnetrol/STI is committed to providing full customer satisfaction both in quality products and quality service.

Magnetrol's quality assurance system is registered to ISO 9001 affirming its commitment to known international quality standards providing the strongest assurance of product/service quality available.



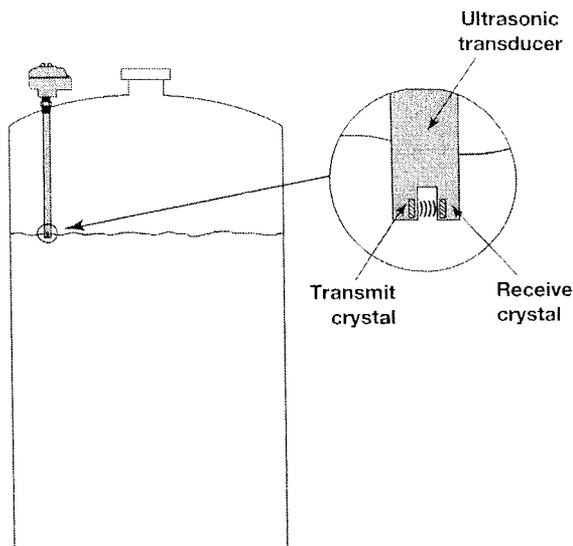
1.0 Introduction

Echotel Model 910 Level Switches utilize ultrasonic contact technology for measuring level in clean liquid applications.

1.1 Principle of Operation

The Model 910 Level Switch uses ultrasonic energy to detect the presence or absence of liquid in a transducer gap. The basic principle behind ultrasonic contact technology is that high-frequency sound waves are easily transmitted across a transducer gap in the presence of a liquid medium, but are severely attenuated when the gap is dry. The Model 910 uses an ultrasonic frequency of 3 MHz to perform this liquid level measurement in a wide variety of process media and application conditions.

The transducer uses a pair of piezoelectric crystals that are encapsulated in epoxy at the tip of the 316 stainless steel transducer. The crystals are made of a ceramic material, that vibrates at a given frequency when subjected to an applied voltage. The transmit crystal converts an electrical signal from the Model 910 electronics into an ultrasonic signal. When liquid is present in the gap, the receive crystal is able to sense the ultrasonic signal from the transmit crystal and convert it back to an electrical signal. This signal is sent to the electronics to indicate the presence of liquid in the transducer gap. When there is no liquid present, the ultrasonic signal is attenuated, and is not detected by the receive crystal.



Ultrasonic signal transmission across transducer gap

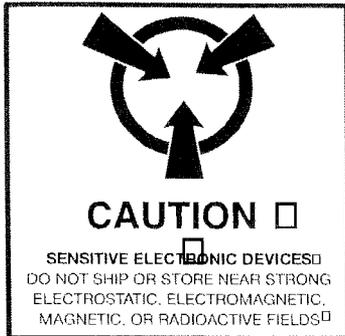
Figure 1

2.0 Installation

2.1 Unpacking

Unpack the instrument carefully. Inspect all units for damage. Report any concealed damage to carrier within 24 hours. Check the contents of the packing slip and purchase order. Check and record the serial number for future reference when ordering parts.

2.2 Electrostatic Discharge (ESD) Handling Procedure



Magnetrol/STI's electronic instruments are manufactured to the highest quality standards. These instruments use electronic components that may be damaged by static electricity present in most work environments.

The following steps are recommended to reduce the risk of component failure due to electrostatic discharge.

- Ship and store circuit boards in anti-static bags. If an anti-static bag is not available, wrap the board in aluminum foil. Do not place boards on foam packing materials.
- Use a grounding wrist strap when installing and removing circuit boards. A grounded workstation is recommended.
- Handle circuit boards only by the edges. Do not touch components or connector pins.
- Make sure that all electrical connections are completely made and none are partial or floating. Ground all equipment to a good, earth ground.

2.3 Preliminary Operational Check

After unpacking and before installation, perform the following operational check on the unit in a non-hazardous area:

1. Apply proper operating voltage to terminals L1 and L2/N. Power supply ground should be connected to the green ground screw in housing base.
2. Fill a suitable container with liquid.
3. Place transducer gap in the liquid. The relay output should actuate.
4. Remove transducer from the liquid. The relay output should de-actuate. In case of malfunction, consult *Section 3.1, Troubleshooting* on page 6.

Caution: This unit contains CMOS electronics which may become damaged by static electricity. Do not touch any semiconductor devices unless you are properly grounded.

2.4 Mounting

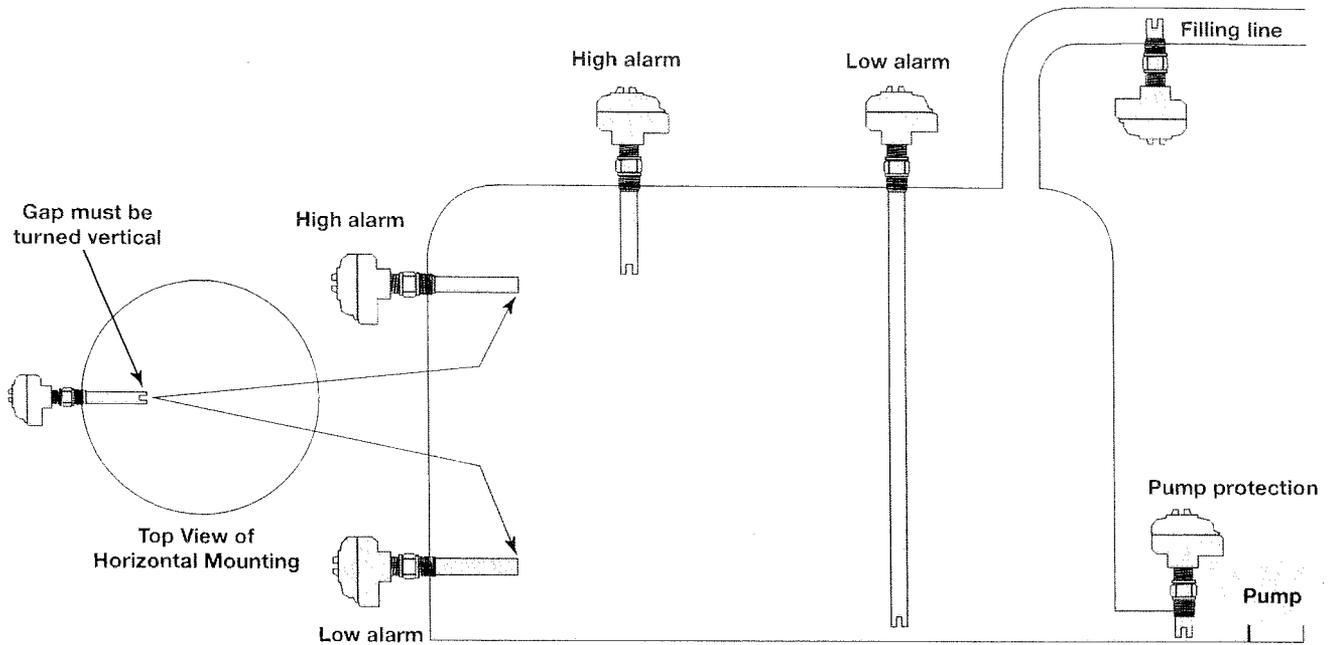


Figure 2
Typical Mounting Orientations

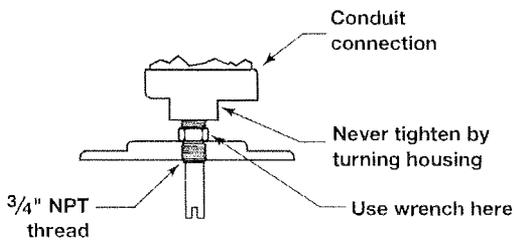


Figure 3
Vertical Mounting

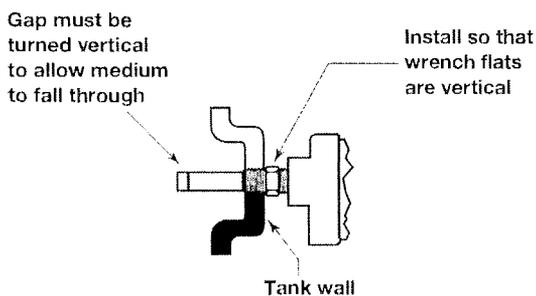


Figure 4
Horizontal Mounting

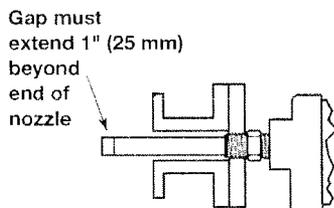


Figure 5
Nozzle Mounting

Model 910 level switches are shipped as integral units with the electronics assembled to the transducer. They may be mounted in a variety of positions as shown in Figures 2 through 5.

Proper orientation of the transducer gap will provide maximum performance in difficult applications. When the switch is mounted horizontally, the transducer gap must be turned vertical to allow proper drainage of the liquid media. See Figures 2 and 4.

Screw transducer into the opening using pipe compound or thread tape. If flanged, bolt unit to mating flange with proper gasket.

Caution: Never tighten unit on the tank connection by turning the housing. Use a wrench on the transducer mounting nut flats. Use thread tape or suitable pipe compound on the threads. Do not overtighten.

When installed in a nozzle or pipe, the transducer gap must extend into the tank at least one inch beyond the inside tank wall. Refer to Figure 5.

2.5 Wiring

2.5.1 Power

Power connections are made at the two-position terminal block labeled TB1 within the electronics enclosure. Use of 14–22 AWG twisted shielded pair wire is recommended.

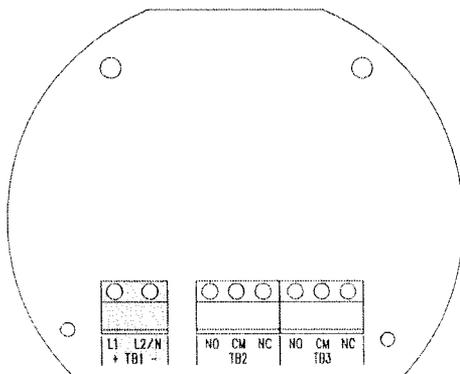
NOTE: Observe all applicable electrical codes and proper wiring procedures.

1. Make sure the power is turned off.
2. Unscrew and remove the housing cover.
3. Prevent moisture seepage into housing by installing an approved seal-drain fitting in the conduit run leading to the unit.
4. Route wires into housing.
5. Connect ground wire to green ground screw located in the base of the housing. **DO NOT** proceed until ground connection is made.
6. After grounding is complete, connect the power leads to proper terminals as follows:

<u>VAC Units</u>	<u>VDC Units</u>
L1, L2/N	+, -

Caution: In hazardous areas, do not power the unit until the conduit is sealed and the enclosure cover is screwed down securely.

7. Dress wiring to ensure no interference or contact with cover or circuit board components.

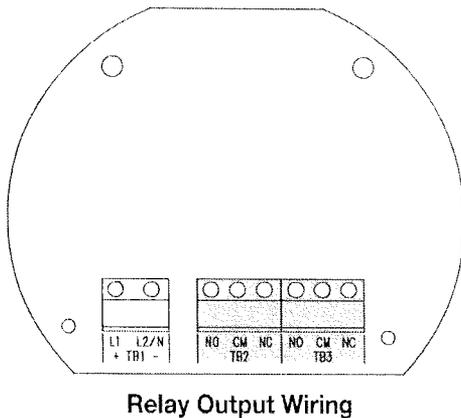


TB1 Power Wiring

2.5.2 Relay

Model 910 switches have a number of possible relay wiring options. The table below lists the relay contact positions for all possible combinations of power failure, condition of the transducer gap, and fail-safe jumper position. The user must decide which combinations constitute fail-safe and alarm conditions, and then select the appropriate relay wiring and fail-safe position.

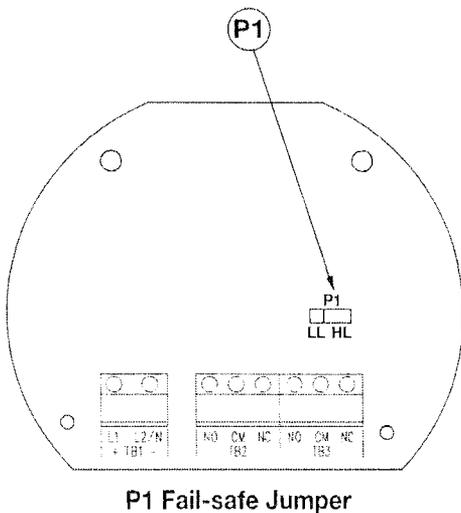
1. Run relay output wiring to the terminal blocks labeled TB2 and TB3. Ensure that the load to be controlled is within the relay's rated capacity as shown in *Section 3.3.2, Electrical* on page 6.
2. Select high or low fail-safe using the P1 jumper.



P1 Fail-safe Jumper Position	Line Power	Transducer Gap	Relay Terminals	
			CM to NC	CM to NO
Low level	On	Dry	Closed	Open
		Wet	Open	Closed
	Failure	Dry	Closed	Open
		Wet	Closed	Open
High level	On	Dry	Open	Closed
		Wet	Closed	Open
	Failure	Dry	Closed	Open
		Wet	Closed	Open

3. Replace housing cover. Installation is complete.

Caution: Never tighten unit to the tank connection by turning the housing. Use a wrench on the transducer mounting nut flats. Use thread tape or suitable pipe compound on threads. Do not over tighten.



3.0 Reference Information

3.1 Troubleshooting

Caution: In hazardous areas, do not remove housing cover until power is disconnected and atmosphere is determined to be safe.

3.1.1 No signal with level change

- Verify power and control circuit wiring.
- Make sure liquid is filling the transducer gap.
- Check for dense foam on surface or dried product in the gap. Unit will not function properly if either condition exists.
- Check transducer phone plugs for proper insertion in J1 and J2.
- If control circuit does not actuate, consult factory.

3.1.2 Calibration

Model 910 switches do not require field calibration. The set point is not adjustable.

3.1.3 Switch chatter

- Check voltage to make sure it is within tolerances shown in Section 3.3.2.
- Check for turbulence. Relocate control or isolate from turbulence.
- Check for excessive aeration.
- Consult factory.

3.1.4 Control output will not de-actuate

- Check transducer for plugged gap.
- Check for dense foam or liquid in gap.
- If control circuit does not de-actuate, consult factory.

3.2 Agency Approvals

AGENCY	APPROVED MODEL	PROTECTION METHOD	AREA CLASSIFICATION
FM	910-XXXX-XXX	Explosion Proof	Class I, Div. 1; Groups C & D Class II, Div. 1; Groups E, F, & G Class III, NEMA Type 4X
	910-XXXX-XXX	Non-Incendive	Class I, Div. 2; Groups A, B, C, & D Class II, Div. 2; Groups F & G Class III, NEMA Type 4X
CSA	910-XXXX-XXX	Explosion Proof	Class I, Div. 1; Groups C & D Class II, Div. 1; Group E, F, & G Class III, Type 4X
	910-XXXX-XXX	Non-Incendive	Class I, Div. 2; Groups A, B, C, & D Class II, Div. 2; Groups E, F, & G Class III, Type 4X
ATEX	910-5XXX-XXX 910-PXXX-XXX		 II 1/2 G EEx d II C T6/EEx e II T6
			

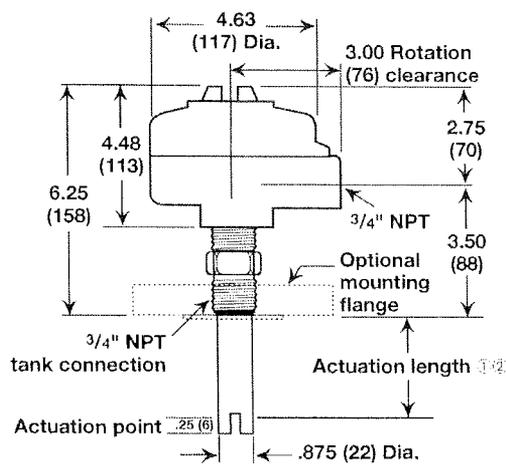


These units have been tested to EN 50081-2 and EN 50082-2 and are in compliance with the EMC Directive 89/336/EEC.

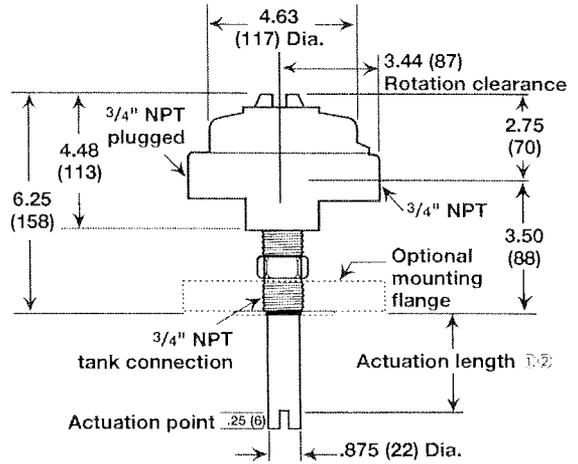
3.3 Specifications

3.3.1 Physical

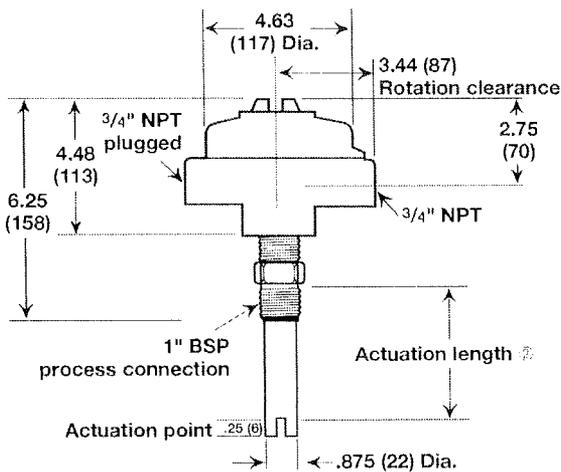
inches (mm)



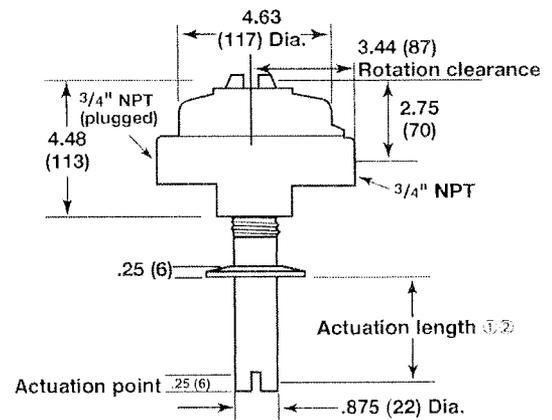
**316 stainless steel housing
(Single 3/4" NPT conduit)**



**Aluminum sand cast housing
(Dual 3/4" NPT conduits)**



**Aluminum sand cast housing
(Dual 3/4" NPT conduit w/1" BSP process connection)**



**Aluminum sand cast housing
(Dual 3/4" NPT conduit with sanitary flange)**

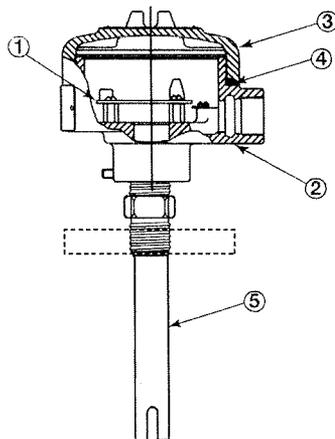
- ① 1" (Code 001) minimum with NPT threaded process connections.
2" (Code 002) minimum with sanitary or ANSI flanged process connections.
- ② .25 (Code 003) mm minimum with NPT threaded process connections.
50 (Code 005) mm minimum with 1" BSP, and sanitary or ANSI flanged process connections.

3.3.2 Electrical

Power Supply:	120 VAC (+10%/-15%), 50/60 Hz 240 VAC (+10%/-15%), 50/60 Hz 24 VDC (±10%)
Power Consumption:	2.5 VA nominal
Relay Output:	Gold flash DPDT relay: 10 amps @ 120 VAC, 240 VAC, 24 VDC ① Hermetically sealed DPDT relay: 5 amps @ 120 VAC, 24 VDC, and 3 amps @ 240 VAC
Repeatability:	0.078" (2 mm)
Fail-safe Configuration:	Field selectable high or low
Calibration:	None required
Ambient Temperature:	Electronics: -40° to +160° F (-40° to +71° C)
Process Temperature:	Transducer: -40° to +250° F (-40° to +121° C)
Operating/Non-Operating Pressure:	800/1500 psig (55/103 bar)
Shock	ANSI/ISA-S71.03 Class SA1
Vibration	ANSI/ISA-S71.03 Class VC2

① Gold flash DPDT relay is rated at 8 amps when used with Housing codes 5 or P

3.4 Replacement Parts



No.	Description	Part Number	
1	PC Board	120 VAC w/10 amp relay	Z30-2043-003
		240 VAC w/10 amp relay	Z30-2043-004
		24 VDC w/10 amp relay	Z30-2043-002
		120 VAC w/5 amp HS relay	Z30-2043-011
		240 VAC w/3 amp HS relay	Z30-2043-012
		24 VDC w/5 amp HS relay	Z30-2043-010
2	Housing Base	Aluminum w/FM and CSA	004-9182-002
		Aluminum w/all 3 approvals	004-9182-008
		316 SS w/FM and CSA	004-9140-001
		316 SS w/CENELEC	004-9140-001
3	Housing Cover	Aluminum w/FM and CSA	004-9105-001
		Aluminum w/all 3 approvals	004-9105-005
		316 SS w/FM and CSA	004-9142-001
		316 SS w/CENELEC	004-9142-001
4	O-Ring	012-2101-345	
5	Transducer	Consult factory	

WARNING! Explosion hazard — Substitution of components may impair suitability for Class 1, Division 2 rating.

WARNING! Explosion hazard — Do not disconnect equipment unless power has been switched off, or the area is known to be non-hazardous.

3.5 Model Numbers

3.5.1 Model 910

HOUSING

A	Aluminum sand cast with 3/4" NPT dual conduit, FM and CSA approvals
Y	316 stainless steel with 3/4" NPT single conduit, FM and CSA approvals
P	Aluminum sand cast with 3/4" NPT dual conduit, FM, CSA and ATEX approvals
5	316 stainless steel with 3/4" NPT single conduit, ATEX approval

TRANSDUCER UNIT OF LENGTH

1	English (actuation length in inches)
M	Metric (actuation length in centimeters)

PROCESS CONNECTION

A	3/4" NPT
2	1" NPT
9	1" BSP
3	1 1/2" sanitary flange, 16 amp (Compatible with Tri-Clover Tri-Clamp® fittings)
4	2" sanitary flange, 16 amp (Compatible with Tri-Clover Tri-Clamp® fittings)
1	1" 150 lb. ANSI raised face flange
C	1 1/2" 150 lb. ANSI raised face flange
D	2" 150 lb. ANSI raised face flange
E	1" 300 lb. ANSI raised face flange
F	1 1/2" 300 lb. ANSI raised face flange
G	2" 300 lb. ANSI raised face flange

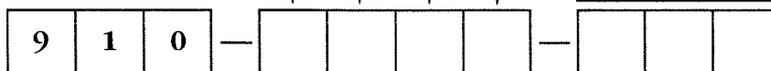
INPUT POWER

0	120 VAC with 10 amp DPDT gold flash relay
1	240 VAC with 10 amp DPDT gold flash relay
2	24 VDC with 10 amp DPDT gold flash relay
H	120 VAC with 5 amp DPDT hermetically sealed relay
J	240 VAC with 3 amp DPDT hermetically sealed relay
K	24 VDC with 5 amp DPDT hermetically sealed relay

ACTUATION LENGTH

1" to 96" in 1" increments (with Transducer Unit of Length code 1) Example: 4 inches = 004 ^① ^③

3 cm to 244 cm in 1 cm increments (with Transducer Unit of Length code M) Examples: 6 centimeters = 006 ^② ^③



^① 1" (code 001) minimum with NPT process connections, 2" (code 002) minimum with sanitary or ANSI flanged process connections.

^② 2.5 cm (code 003) minimum with NPT process connections, 5 cm (code 005) minimum with 1" BSP, or sanitary or ANSI flanged process connections.

^③ Consult factory for longer lengths.

Service Policy

Owners of Magnetrol/STI controls may request the return of a control or any part of a control for complete rebuilding or replacement. They will be rebuilt or replaced promptly. Controls returned under our service policy must be returned by Prepaid transportation. Magnetrol/STI will repair or replace the control at no cost to the purchaser (or owner) other than transportation if:

1. Returned within the warranty period; and
2. The factory inspection finds the cause of the claim to be covered under the warranty.

If the trouble is the result of conditions beyond our control; or, is NOT covered by the warranty, there will be charges for labor and the parts required to rebuild or replace the equipment.

In some cases it may be expedient to ship replacement parts; or, in extreme cases a complete new control, to replace the original equipment before it is returned. If this is desired, notify the factory of both the model and serial numbers of the control to be replaced. In such cases, credit for the materials returned will be determined on the basis of the applicability of our warranty.

No claims for misapplication, labor, direct or consequential damage will be allowed.

Return Material Procedure

So that we may efficiently process any materials that are returned, it is essential that a "Return Material Authorization" (RMA) number be obtained from the factory, prior to the material's return. This is available through Magnetrol/STI's local representative or by contacting the factory. Please supply the following information:

1. Company Name
2. Description of Material
3. Serial Number
4. Reason for Return
5. Application

Any unit that was used in a process must be properly cleaned in accordance with OSHA standards, before it is returned to the factory.

A Material Safety Data Sheet (MSDS) must accompany material that was used in any media.

All shipments returned to the factory must be by prepaid transportation.

All replacements will be shipped F.O.B. factory.

NOTE: See Electrostatic Discharge Handling Procedure on page 2.



5300 Belmont Road • Downers Grove, Illinois 60515-4499 • 630-969-4000 • Fax 630-969-9489 • www.magnetrol.com
145 Jardin Drive, Units 1 & 2 • Concord, Ontario Canada L4K 1X7 • 905-738-9600 • Fax 905-738-1306
Heikensstraat 6 • B 9240 Zele, Belgium • 052 45.11.11 • Fax 052 45.09.93
Regent Business Ctr., Jubilee Rd. • Burgess Hill, Sussex RH15 9TL U.K. • 01444-871313 • Fax 01444-871317



5300 Belmont Road • Downers Grove, Illinois 60515-4499 • 630-969-4028 • Fax 630-969-9489 • www.sticontrols.com

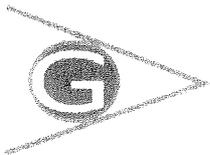
Copyright © 2005 Magnetrol International, Incorporated. All rights reserved. Printed in the USA.
Magnetrol and Magnetrol logotype are registered trademarks of Magnetrol International
STI and STI logotype are registered trademarks of Magnetrol International

Performance specifications are effective with date of issue and are subject to change without notice.
The brand and product names contained within this document are trademarks or registered trademarks of their respective holders.

BULLETIN: 51-604.14
EFFECTIVE: January 2005
SUPERSEDES: July 2004

APPENDIX F-1

**FIRE PROTECTION SYSTEM
TECHNICAL DEMONSTRATION**



Grainger Consulting, Inc.

*Fire Protection / Forensic Engineering * Code Consulting*

1555 E UNIVERSITY STE 1 * MESA, AZ 85203 * 480.833.2100 * Fax 480.833.2941 * www.graingerconsulting.com

REPORT OF FINDINGS – SPRINKLER HYDRAULICS PAGE 1 OF 5

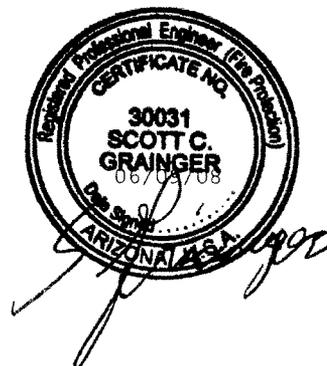
PROJECT: CLEAN HARBOR (LAIDLAW), PHOENIX

GC #2328

DATE: 9 June 2008

CLIENT:

Brian Parker
Clean Harbor Environmental Services
42 Longwater Dr
Norwell, MA 02061-1612
602-391-9508 cell



EX 03/31/2011

PURPOSE:

Provide analysis of the fire suppression systems at the site for compliance with the Phoenix Fire Code including a discussion regarding containment requirements as requested in Item #76, ADEQ Second Notice of Deficiency.

STATEMENT:

Findings, conclusions, recommendations and opinions presented in this report are based on the facts known to this Engineer as of the date of this report. This report may be amended if new facts are discovered.

REFERENCES:

National Fire Protection Association (NFPA)

NFPA 13, 2002, Installation of Sprinkler Systems

NFPA 25, 2002, Inspection Testing and Maintenance of Water-Based Fire protection Systems

International Council of Building Officials (ICBO)

Uniform Building Code (UBC), 1994, as adopted by City of Phoenix

Uniform Fire Code, (UFC), 1994, as adopted by City of Phoenix

International Code Council (ICC)

International Building Code (IBC), 2006, as adopted by City of Phoenix

International Fire Code (IFC), 2006, as adopted by City of Phoenix

SITE CONDITIONS EXISTING:

Suppression System Description

There is an automatic fire sprinkler system protecting the Office, Maintenance Area, Work Stations #1, 2, 3, & 4 and the hazmat warehouse areas (CSA I & CSA II) and the loading dock. All systems are wet pipe. The suppression system is system is monitored by a fire alarm system.

All valves are supervised. Water flow is monitored.

The system in CSA II is a double-interlocked closed head ARC AFFF (Alcohol Resistant Concentrate, 3%, Aqueous Film Forming Foam) system. This pipe is flooded but requires the activation of at least one sprinkler head and heat detection by the linear heat detection system prior to automatic activation of the deluge valve. The foam storage is located in the riser room. A minimum of 384 gal of concentrate is required (15 minutes of design flow).

The temperature ratings of the heads in each area are as follows:

AREA	HEAD TEMPERATURE (F)	LINEAR HEAT DETECTOR TEMP (F)
Office	165	
Maintenance	286	
CSA I	286	
CSA II	286	190
Work Stations	286	

Hydraulic Calculations

GCi prepared hydraulic calculations for the suppression system in each area except the Office and Loading Dock. The office area is supplied by the same wet pipe system that supplies the Maintenance area. The design requirements of the Maintenance area are considerably greater than those of the Office. There is no question that the design density of the Office system will be provided. The Loading Dock is supplied by the same piping system that supplies CSA I. The Loading Dock is smaller than CSA I. The smallest piping in the Loading Dock system is 2". The smallest pipe size in CSA I is 1". There is no question that the Design Density of the Loading Dock will be provided if the CSA I system is compliant, which it is. A copy of the hydraulic calculation sheets for each system is located in the GCi project file and is available upon request.

The calculations are based upon the original fire hydrant flow test that is referenced in the original design documents. Static pressure: 82 psi; Residual pressure 78 psi with 1185 gpm flowing. The current static pressure at the site is approximately 82 psi. a city flow test was run by Phoenix Water Services Department on 4 February 2008. A Copy is attached. (The static is now 88 psi, residual 82 psi with 1278 gpm flowing. The available pressure and flow have increased thus improving the operational characteristics of the system.)

Containment

The secondary containment is the warehouse floor of each area in all cases. {IFC 2704.2.2.3} The required volume of containment is the largest vessel plus the sprinkler design flow over the minimum design area or the room or area where storage is located; whichever is smaller for 20 minutes.

A summary of the containment requirements for each warehouse system and the hydraulics routine results is provided in the Hydraulics Table. The Table provides the design density, design area, design flow, containment volume based upon the design flow and the available containment volume for each area. The required containment volumes for the CSA I, CSA II areas exceed the available containment volume. This does not comply with the requirements of the IFC.

Testing / Maintenance

NFPA 25 is the primary source of regularly scheduled testing and maintenance requirements for the sprinkler and fire alarm systems. Records available at the site indicate that the testing / maintenance inspections have not been adequate. All of the deficiencies noted below in this report are of the nature to have been noted in annual or more frequent tests and inspections.

General Code Compliance of Suppression Systems

There are deficiencies in the systems as noted below:

1. The fire riser room is not heated or separated from the hazardous storage area. A 1 hour fire resistive wall is required to separate the riser room from the adjacent hazmat storage area. This room is required to be heated to maintain a minimum temperature of 40° F. No heat is provided.
2. The fire riser room requires ventilation adequate to keep the interior ambient temperature below 120° F to maintain the Protecto-wire fire panel within manufacturer prescribed limits.
3. No heating or cooling provided in riser room. Heating is required to maintain a minimum temperature of 40° F. Cooling or other means is required to maintain room temperature below 120° F.
4. A reduced pressure backflow preventer is required to separate all of the fire sprinkler systems from the city supply and also to separate the foam system piping from the city supply. This includes the work station systems. No reduced pressure backflow preventer is provided. The device may be located at either the riser or at the site fence. The hydraulic calculations that GCi prepared include the pressure loss for an Ames 4000SS 6" reduced pressure device.
5. The number of snouts on the existing fire department connection (2) is not adequate to supply the minimum flow requirements of the largest (CSA II) system. A minimum of 4 snouts is required.

6. The foam bladder tank is located in the riser room which has no temperature control system. The foam, Ansulite 3x3 low viscosity alcohol resistant concentrate has been exposed to temperatures below the manufacturer recommended minimum of 35F and to temperatures above the maximum recommended 120F. The foam should be sampled and tested for separation. The foam storage must be modified to comply with the temperature limits recommended.
7. The foam system proportioner is 4". The characteristics of this valve are such that it is not appropriate for use with the system. It is only functional at flows between 245 gpm and 1469 gpm. A release of less than approximately 3 heads or fewer will result in no foam injection into the water flow. A 3" valve would provide flows more closely aligned with both the minimum flow (1 head) and the design flow for the entire system. The calculations prepared by GCi are based upon a 3" proportioner being installed. If the 4" proportioner is left in place, the actual flows will be greater due to a smaller pressure loss in the existing 4" proportioner.
8. The foam storage has been exposed to excessive temperatures in both extremes in the storage area. The foam must be mixed and tested in accordance with manufacturer recommendations.

HYDRAULICS TABLE

Location	Design Density (gpm / SF)	Design Area (SF)	Flow ¹ (gpm)	Containment ² (gal)	
			Design ³ Flow	Design ⁴	Available ⁵ Volume
CSA I	0.17	3,000	530	10,600	4,301
CSA II	0.25	3,000	854	17,080	14,300
Maintenance	0.20	1,500	311	No containment required	
Work Stations four equal size rooms	0.20	3,000, actual area, all 4 rooms, 1,368	360 (full design area) 90 (one work station)	1,800 ⁶	1,877 ⁷
Loading Dock	0.20	3,000 Actual area is 1,400		No containment required	
Office	0.10	1,500		No containment required	

PREPARED BY:
 Scott Grainger, PE
 Fire Protection Engineer

Attachment:
 Phoenix Flow Test Report dated 2/4/08

¹ Flow over design area. The minimum design complies with Phoenix Fire Code requirements. Flows shown do not include hose flows.

² The volume of water for a 20 minute flow in the design area based upon. The Phoenix Fire Code {IFC 2704.2.2.3} requires containment of 20 minutes of design flow except when the design area is separated by rated walls or in the case in the work stations where containment is only required for the single largest separated area; all four of the workstations are the same size.

³ Min.Flow to comply with design density. Based upon hydraulic calculations prepared by GCi using the existing piping

⁴ Based upon 20 min. flow per IFC and original flow test data

⁵ Volume data provided was taken from the AKE report, converted from cubic feet to gallons. Total containment volumes are used. The IFC recognizes that materials are moved in and out and total displacement volumes fluctuate.

⁶ Flow volume in one workstation.

⁷ Volume of containment in one workstation.

City of Phoenix, Water Services Department Fire Flow Test



Location: 1340 W LINCOLN ST. Q.S. No. 9-25
 For: GRAINGER CONSULTING
 Requested By: SCOTT Request Date: 1/30/2008
 Phone: _____ Fax Number: 480-833-2941
 Test Type: X 2.5" Std. 4" Std. Complex
 Observers: White/List
 Test Time: 2:45 PM Test Date: 2/4/2008

CAUTION: Results of this flow test identify water system characteristics for the date, time, and locations of this test only.

Pressure and flows within the water system vary of time, it is expected and should be considered when preparing designs based upon fire flow test data.

Numerous factors affect the water system, such as water level fluctuations in reservoirs, operating pressure ranges at booster pump stations, elevations at point of use, daily demand fluctuations, seasonal demands, emergency demands, water treatment plant availability, increased demands due to growth, operation/maintenance schedules, etc.

Designers should consider the above when preparing designs based upon fire flow test data. The City of Phoenix may be able to provide additional information on water system characteristics upon request.

NOTE: TEST LOCATION SKETCH IS ATTACHED

Observed Test Data						
Hydrant Designation	Hydrant Number	Flow Opening (2.5" or 4")	Static Pressure (psi)	Residual Pressure (psi)	Pilot Pressure (psi)	Flow (gpm)
Pressure, R	206		88	82		
Flow, F1	210	2.5			58	1278
Flow, F2						
Flow, F3						
Flow, F4						

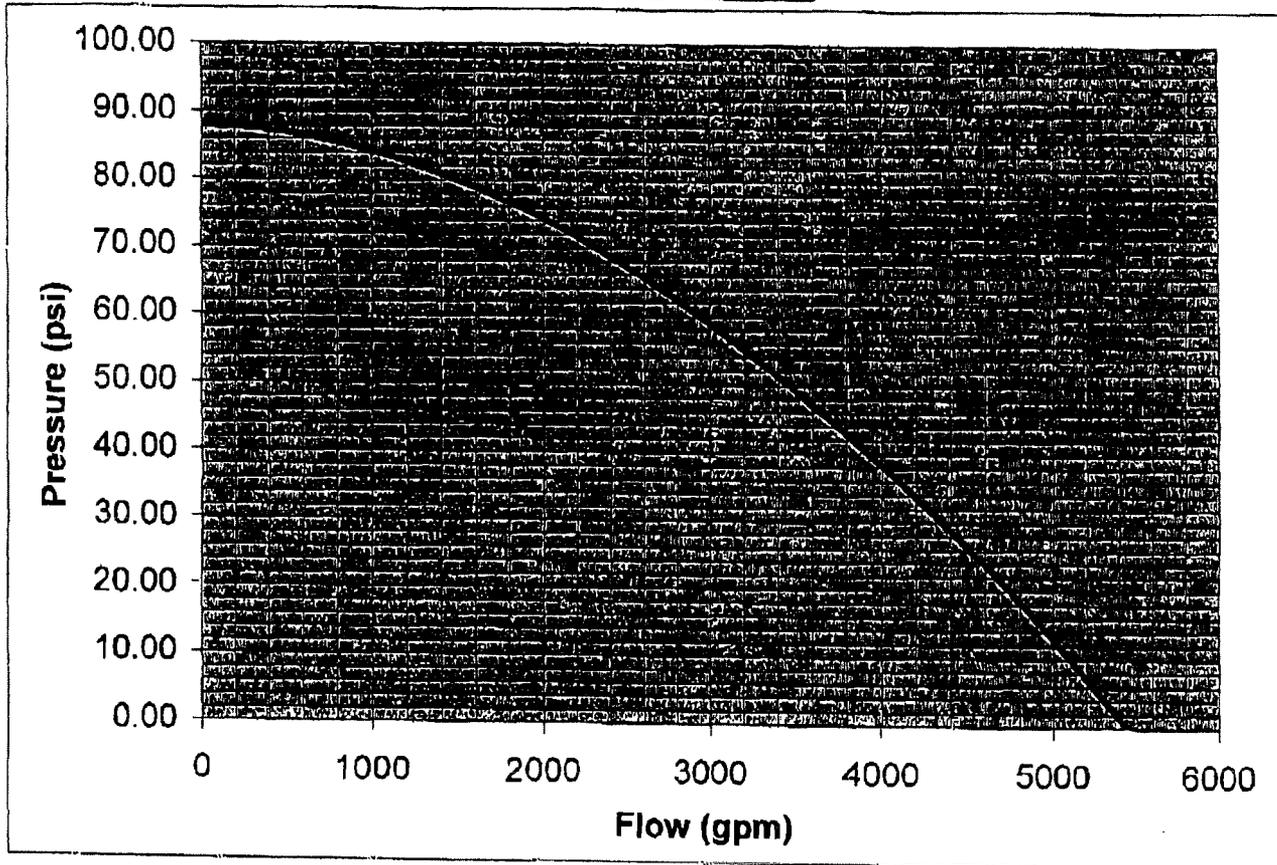
Note: Hydrant Nozzle Coef. = 0.9

**Pressure Drop %
6.6%

Total Flow: 1278

Calculated Results		
Pressure (psi)	20	25
Flow (gpm)	4741	4549

To obtain satisfactory test results of theoretical calculation of expected flows or rated capacities, sufficient discharge should be achieved to cause a drop in pressure at the residual hydrant of at least 25%, or to flow the total demand necessary for fire-fighting purposes.



Revision Date: 9/15/2006

