
Final

**Taylor Lumber and Treating
Superfund Site
Operation and Maintenance
Plan**

Prepared for

U.S. EPA

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SECTION 1

Introduction

This Operation and Maintenance (O&M) Plan has been prepared in accordance with the requirements of Section 104 c (3) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). This plan describes the administrative, financial and technical requirements for inspecting, monitoring, operating and maintaining the final remedy at the Taylor Lumber and Treating (TLT) Superfund Site in Sheridan, Oregon (Figure 1-1). This plan includes specific O&M manuals, provided as appendices, which provide more detailed technical information necessary to monitor, inspect, maintain and operate the remedy.

Under CERCLA, as a fund-lead site, implementation of the final remedy was conducted by the United States Environmental Protection Agency (EPA), and after the remedy is deemed operational and functional (O&F), responsibility for operation and maintenance of the final remedy is turned over to the State. The Oregon Department of Environmental Quality (ODEQ) is the State agency responsible for ensuring that O&M of CERCLA-funded remedial actions is carried out at the site.

1.1 Purpose

The purpose of this O&M plan to provide a framework for ensuring that the administrative, financial and technical requirements for inspecting, monitoring, operating and maintaining the low permeability asphalt cap, subsurface barrier wall and groundwater extraction systems in a manner that complies with the applicable remedial action objectives (RAOs) for the site.

Based on information presented in the RI/FS report (CH2M HILL, 2004), EPA promulgated its decision for addressing risks at the TLT site through a Record of Decision (ROD; EPA, 2005). The ROD presented a site-wide remedy consisting of multiple remedial action elements. This plan specifically addresses three portions of the remedy only, namely:

- Replacement of the existing asphalt cap, which covers the area within the existing barrier wall, with a durable, low permeability cap to protect human exposure through direct contact with contaminated soils.
- Continued operation and maintenance of the underground barrier wall system at the site, including continuing extraction and treatment of groundwater from within the slurry wall, to prevent migration of contaminated groundwater and dense non-aqueous phase liquid (DNAPL) to the outside of the wall.
- Operation and maintenance of the caps to ensure protection of human health and the environment.

The asphalt cap directly or indirectly addresses the following remedial action objectives at the site:

- Prevent migration of the DNAPL and contaminated groundwater beyond the barrier wall.
- Reduce or eliminate human exposure through direct contact (incidental soil ingestion, skin contact with soil, and inhalation of dust) with soils that exceed 159 milligrams per kilogram (mg/kg) for arsenic.

The groundwater extraction system and barrier wall address all or portions of the following remedial action objectives at the site:

- Prevent migration of the DNAPL and contaminated groundwater to outside of the barrier wall.
- Restrict human exposure to groundwater with contaminant concentrations that exceed federal drinking water standards both inside and outside the barrier wall.
- Minimize future migration of contaminated groundwater to adjacent surface water (Rock Creek, South Yamhill River) to protect ecological receptors.

Institutional controls are an additional component of the remedy not covered in this plan. EPA will be ensuring that institutional controls are implemented for the property defined as the West Facility. Institutional controls are necessary to ensure that the use of the West Facility remains industrial, that the asphalt cap is maintained in place for protection of current future use by onsite workers, and that the groundwater is not used. Upon completion, EPA will provide documentation of this effort to ODEQ.

Remedial design documents for this site included the Final Design and Design Basis Report, Final Design Specifications, and Final Design Drawings (CH2M HILL 2006 a, b, c). The EPA awarded the Remedial Action Construction contract in 2007. RA construction activities are summarized in the Final Construction Report and As Built Drawings (CH2M HILL 2009a, b).

The current owner and operator of the site, Pacific Wood Preserving of Oregon (PWPO), entered a Prospective Purchaser Agreement (PPA) with EPA on May 15, 2002, and with the Oregon Department of Environmental Quality (ODEQ) on February 5, 2002. These agreements are provided in Appendix A of this plan. As part of that agreement, PWPO accepted responsibility for O&M of an existing asphalt cap, soil storage cells and groundwater extraction system. Contaminated soil contained in the soil storage cells was disposed of at an offsite landfill during remedial action construction in 2007 (CH2M HILL, 2009a). Therefore, O&M of the soil storage cells is no longer required. However, PWPO will continue to be responsible for inspection and O&M of the low permeability asphalt cap and groundwater extraction system as stated in the PPA.

1.2 Organization and Content

This O&M Plan is organized as follows:

Section 1- Introduction: describes the remedial action objectives of the asphalt cap and the purpose and organization of this plan.

Section 2 - Asphalt Cap Operation and Maintenance Requirements: summarizes the cap design and construction elements, and explains the scope and frequency of the required inspections, and who is responsible for conducting inspections and repairs.

Section 3 - Subsurface Barrier Wall Operation and Maintenance Requirements: summarizes the barrier wall system design and construction, the scope and frequency of the required inspections, and who is responsible for conducting inspections and repairs.

Section 4 - Groundwater Extraction System Operation and Maintenance Requirements: summarizes the groundwater extraction system elements, and explains the scope and frequency of the required inspections, and who is responsible for conducting inspections and repairs.

Section 5 - Documentation and Reporting: summarizes and explains the requirements for documenting and reporting operation and maintenance of the final remedy.

Section 6 - Operations and Maintenance Costs: documents the estimated costs of operating and maintaining the final remedy.

Section 7 - Health and Safety Requirements: provides an overview of applicable health and safety requirements for performing operations and maintenance work at the site.

Section 8 - Conditions for Operation and Maintenance Termination provides an overview of the requirements necessary to terminate operation and maintenance of the site remedy.

Section 9 - References.

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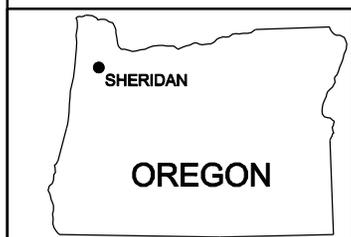
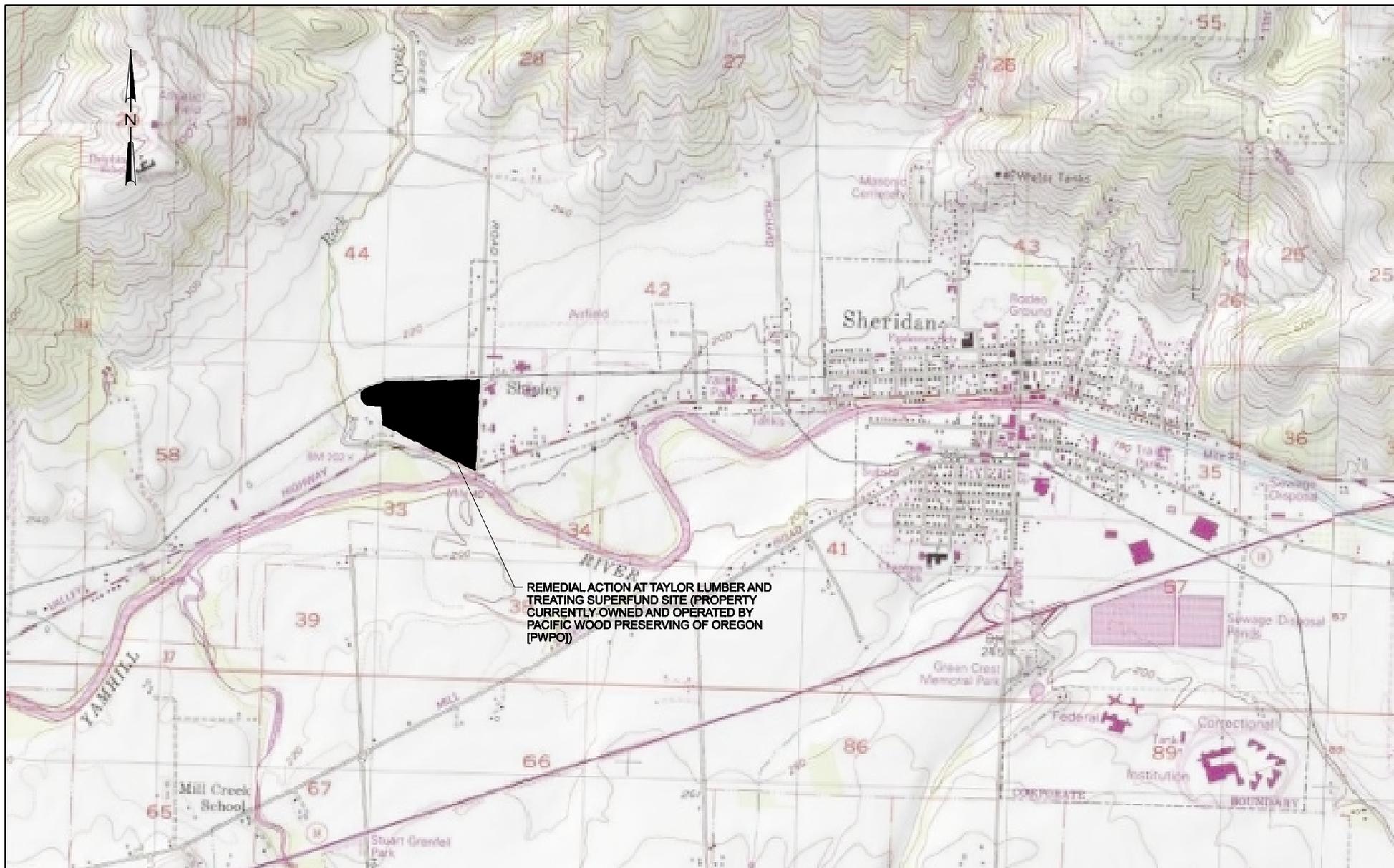


FIGURE 1-1
SITE VICINITY MAP
 TAYLOR LUMBER AND TREATING SUPERFUND SITE
 SHERIDAN, OREGON

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Asphalt Cap Operation and Maintenance Requirements

O&M requirements for the asphalt cap include periodic inspections and any necessary repairs based upon inspection results. O&M can also include preventative maintenance such as fog sealing, and necessary repairs resulting from planned or unplanned penetrations of the cap (e.g., utility installation or repair). These O&M requirements are dictated by the PPA, the particular design requirements of the cap, and any product-specific requirements of the asphalt material used in the cap.

2.1 Asphalt Cap Design and Construction

The basis for design of the low permeability asphalt cap was to provide an impermeable surface that achieves a permeability of 1×10^{-8} centimeters per second (cm/sec) or less and provides a suitable working surface for PWPO equipment and operations.

Prior to RA construction in 2007, the area within the barrier wall was covered with a standard asphalt surface, which was constructed in 2000. This asphalt cap was replaced with a low permeability asphalt cap which was constructed from June through August 2007 as part of a larger remedial action construction project. The 5.4 acre cap was designed and constructed to extend beyond the limits of the underlying barrier wall to prevent stormwater runoff from infiltrating into the area contained by the barrier and prevent direct contact with underlying soil contamination. The low permeability asphalt cap was constructed of proprietary materials to meet the design criteria of 1×10^{-8} cm/sec permeability and 4 inch thickness.

The *Final Design and Design Basis Report* (CH2M HILL, 2006a), *Final Design Specifications* (CH2M HILL, 2006b) and *Final Design Drawings* (CH2M HILL, 2006c) provide the design criteria for the low permeability asphalt cap. The *Final Construction Report* (CH2M HILL, 2009a) summarizes remedial action construction activities. As-built drawings documenting the remedial action construction were completed in 2009 (CH2M HILL, 2009b). Appendix B of this plan provides as-built drawings for the pavement repair and reconstruction (see drawing C-11), low permeability asphalt cap (see drawing C-12) and an updated utility plan (see drawing C-2).

Construction of the low permeability asphalt overlay required that the existing pavement be repaired to eliminate damaged areas or cracks which could cause reflection cracking in the low permeability asphalt overlay. A pavement testing firm performed Falling Weight Deflectometer (FWD) testing under subcontract to CH2M HILL in July 2006 (CH2M HILL 2006d) to provide data for design of the asphalt cap cross section. The cross section (thickness) of the low permeability asphalt cap was designed to have a service life of 20 years based on current equipment use and loading at the site (CH2M HILL, 2006a, Section

3.3.2). Design load information for pole and lumber handling and tractor/trailer equipment was obtained from PWPO (CH2M HILL, 2006a). While the 20 year design life of the cap was based on best available information of traffic loading at the time of design, the actual longevity of the cap is dependent actual site conditions. It is likely that areas of higher traffic concentrations will need repair or replacement sooner than areas where little or no traffic loading is seen. Therefore, it should be understood that it is not possible to predict the length of time beyond the 20 years that the cap permeability will still achieve site RAOs. It may be prudent at 20 years to re-test the asphalt using the hydraulic conductivity monitoring described in the asphalt O&M Manual (Appendix D), and evaluate the potential need for implementing measures to meet permeability requirements, such as those described in the O&M Manual (pages 7 and 8).

Areas of the existing asphalt that were in generally acceptable condition were overlaid with 4 inches of proprietary low permeability asphalt mix. Prior to placement of the new asphalt, minor areas of damage within these limits were repaired by removing the damaged asphalt and replacing the 12 inches of subbase material, followed by placement of a heavy duty asphalt patch. A total of 10 areas were patched and repaired in this manner. Four of these patched areas failed to meet quality control requirements set forth in the design specifications. As a result, EPA required the paving subcontractor to provide a 5 year warranty against failure of these patched locations. This warranty, which expires on July 1, 2012, is provided in Appendix C of this plan.

Where the existing pavement was extensively damaged in high traffic areas, the design required reconstruction of the existing subbase to provide sufficient strength to support equipment loads on the new low permeability asphalt cap. Pavement reconstruction consisted of tilling the existing asphalt and subbase material to a depth of 12 inches (5 inches of asphalt and 7 inches of subgrade), mixing in a Portland cement binder and compacting the mixture with a roller into a firm surface. The 4 inch thick low permeability asphalt cap was installed directly over this reconstructed base.

In addition to the pavement repair, reconstruction and overlay, several other activities were performed in support of the cap construction. These activities are as follows:

- Catch basins and extraction well vault covers were raised or replaced as needed to provide proper drainage from the new low permeability asphalt.
- The two open drainage ditches in the southern portion of the paved area were replaced with concrete trench drains.
- Monitor wells no longer needed as part of the monitoring network were abandoned.
- The as-built limits of the barrier wall were marked on the low permeability asphalt by a land surveyor, and a pavement stripe and lettering was added to demarcate the barrier wall centerline.

2.2 Requirements of the PPA

The PPA was developed prior to the final remedy selection and implementation, which included the construction of the low permeability asphalt cap. The PPA requirements are

based on inspection and O&M of the standard asphalt cap in place at the time the PPA was completed. Therefore the PPA requirements do not necessarily apply to the specific requirements of the low permeability asphalt and a modification to the PPA will be required. EPA is responsible for modifying the PPA and obtaining PWPO and ODEQ approval of the changes. EPA anticipates that the PPA modifications will be submitted to PWPO and ODEQ by December 2009. These proposed changes are discussed in Section 2.3.

The existing PPA requires that PWPO personnel perform inspections of the asphalt cap at intervals not to exceed one week (seven calendar days) and that PWPO shall conduct the following O&M activities:

1. Visually inspect the asphalt cover to ensure it is not significantly damaged in a way that compromises the performance of the cap. Ponding of water shall be minimized and cracks repaired as soon as possible after detection.
2. Immediately clean up spills and contamination on the asphalt covers consistent with the appropriate RCRA-approved contingency plan (i.e. storage yard contingency plan).
3. Qualified personnel shall perform asphalt inspections and shall approve and oversee all required maintenance.
4. Lineal cracks and other repairs to the asphalt cover, not exceeding 225 square yards, shall be repaired as soon as feasible. [EPA allowed PWPO to complete all repairs prior to the start of the rainy season each fall, and to limit the repairs of asphalt along the edge of the cap to those that may compromise the top of the slurry wall.]
5. For repairs to the asphalt cover exceeding 225 square yards, PWPO shall prepare a plan that identifies specific procedures, to be used for the repair of the damaged asphalt cover. The plan shall also present a schedule for performance of the necessary repairs and shall identify mechanisms to prevent recurrence of the damage. After EPA approval of the plan, PWPO shall perform the necessary work pursuant to the approved plan.
6. A record of each inspection must be prepared and filed onsite. The inspection records shall be made available to EPA or EPA's authorized representatives upon request. The record shall include the following:
 - a) The time and date of each inspection.
 - b) The name of the person performing the inspection.
 - c) A brief description, including type and location, of any problems identified.
 - d) A brief description of required repairs.
 - e) The time and date that any required repairs were performed.
 - f) The name of the person(s) performing the required repairs.
 - g) The time and date of the inspection and final approval of required repairs.
 - h) The name of the person who inspected and approved the repairs.
7. In the event that the cover area is expanded or modified for remediation purposes, PWPO will continue to perform O&M on the expanded cover areas.
8. These activities shall be performed for as long as asphalt cover is necessary to address contamination at the Site.

2.3 Proposed Modifications to the PPA

As noted, the existing PPA language pertaining to inspection and maintenance of the asphalt cap were written specifically for the standard asphalt paving installed at the site when prior to PWPO purchasing the property. Based on the final remedy constructed at the site, the PPA will be revised to reflect current site conditions and requirements of the final remedy. The summary below provides discussion of key proposed inspection and O&M requirements related to the final remedy.

Portions of the low permeability asphalt cap may need to be reconstructed over time as a result of a failure of the cap itself or possibly as a result of other site-related circumstances, for example:

- Utility installation or repair
- Accidental puncture or breach
- Structure foundation construction or removal

Anytime the low permeability asphalt cap is breached and repaired, the cap must be reconstructed consistent with the remedial design and manufacturer's product specific requirements in order to ensure that the remedial action objectives are satisfied for the selected remedy (refer to Section 1.1). If a variance is needed to the existing cap design for the purpose of a particular repair or construction effort, a plan must be submitted to ODEQ for approval.

The low permeability asphalt used for the cap is a proprietary product that has specific O&M and warranty requirements that meet or exceed the intent of the PPA language. In addition to the requirements of the PPA, PWPO will also be responsible for following any special requirements identified in the product-specific O&M plan and manufacturer's warranty. The product-specific O&M plan (Granite, 2009) was originally completed in March 2008 and revised in August 2009, and is included as Appendix D of this plan. The material and workmanship warranty (Wilder, 2008) for the low permeability asphalt cap was signed by EPA on May 29, 2008 and is included as Appendix E of this plan. These documents provide requirements on who can perform the inspections and repairs, a schedule and guidelines for routine cap inspections, a sample cap inspection log, operational limitations, and recommended maintenance and repair procedures.

Based on the O&M activities outlined in these documents, EPA proposes that the requirements of the PPA be revisited and revised. For example:

1. Weekly inspections will not be necessary given the expected durability of the cap. In addition to routine informal inspections, an annual formal inspection is consistent with the product requirements.
2. For five years (2008 through 2012), an annual report will be sent to EPA and ODEQ verifying that O&M has been conducted appropriately and that the cap is functioning as expected.
3. Annual inspections of the asphalt cap will be performed by ODEQ starting in 2013 for the remainder of the duration of the cap is in place.

Additional O&M related requirements that were not detailed in the PPA include:

1. PWPO is required to dispose of any asphalt and subgrade removed during repairs or modifications in accordance with state and federal regulations. The material may not be stockpiled onsite.
2. O&M of the pavement striping delineating the location of the barrier wall and protective cap per product-specific requirements will be the responsibility of PWPO.
3. Any necessary crack sealing, patch repair, and fog sealing per product-specific requirements will be the responsibility of PWPO.
4. The two concrete trench drains installed as part of the stormwater conveyance system collect surface water runoff from the asphalt cap and convey it toward the Stormwater Treatment System (SWTS). As a result, any debris that can be carried by stormwater will usually find its way to the trench drain and require periodic cleanout. The material removed from the trench drains will be disposed of by PWPO in compliance with state and federal hazardous waste regulations. Specific O &M activities for these trench drains include:
 - a. Remove any debris that may collect on top of the grates after a storm event.
 - b. Periodically check in the trench under the grating for debris that may obstruct the drainage path, and remove any debris. EPA suggests regular inspections at first, and set the inspection schedule based off of those observations. The trench drain should be inspected at least once a year.
5. Three extraction well vault frames and covers (PW-01, PW-03 and PW-03) were modified during RA construction to accommodate the grade of the low permeability asphalt cap. The vault covers were replaced with water tight units with bolt on covers that periodic inspection and maintenance as described below:
 - a. Well vault covers should be checked periodically to ensure they are still secure. The pumps currently need to be checked weekly. Operation of the extraction wells require that the well vaults be vented to the atmosphere to allow the pneumatic pumps to operate. Securing the bolts on the covers may not provide sufficient venting, and therefore PWPO has removed the bolts. . However, if the extraction wells are turned off for a significant period of time (longer than for routine maintenance), the bolts should replaced and be checked every 6 months to ensure they are still snug and secure.
 - b. Fork trucks should use a minimum ground clearance of 4-6 inches from the lowest part of the front (tips) of the load and 2 inches from the back (heels) of the load in order to clear the vaults and vault hinges. This is unchanged from standard fork truck safety protocol.
 - c. If snowplows are used on site, do not run over the vaults, as the plow may catch on the lip of the concrete pad or the hinges to the vault cover. If plowing over the vaults is necessary, the blade should be at least 3" off the ground to ensure adequate clearance.

- d. Normal traffic flow from vehicles with pneumatic tires (semi trailers, industrial fork trucks) do not present any special concern for the vault hinges, as the hinges are made of 1/8" thick stainless steel. Avoid running over the hinges with heavy vehicles that use solid rubber tires.
6. PWPO will provide documentation on an annual basis, to ODEQ and EPA, of off-site disposal of filter cake from SWTS and sediment/sludge removed from trench drains.

Table 2-1 provides a brief summary of the proposed O&M plan requirements for the low permeability asphalt cap based on existing PPA requirements, manufacturer's product-specific requirements, and EPA's proposed changes to the PPA.

TABLE 2-1: ASPHALT CAP OPERATION AND MAINTENANCE REQUIREMENTS
Taylor Lumber and Treating Superfund Site
Sheridan, Oregon

Activity	Description	Required By	Frequency
1	Informal visual inspection during the course of normal operations to identify signs of cracks or damage to the cap.	MFG	Continuous
2	Special inspection of all affected areas of the cap any time a site incident, activity or atypical weather event may have caused reason to suspect potential damage to the cap.	MFG	As required
3	Special Inspection of areas affected by changes in use of the facility or if the site is subject to heavy and/or prolonged use in concentrated areas.	MFG	As required
4	Annual inspection by qualified personnel.	MFG, Proposed	Annual
5	Submit Annual Inspection report to regulatory agencies.	MFG, Proposed	Annual
6	Immediate clean up of spills and contamination from asphalt surface.	PPA, MFG	Within 24 hours of detection
7	Repair of cracks in asphalt surface where less than 100 linear feet of cracks are noted within a 320 square foot area. Repair by sealing, or if cracks are spaced less than 5 feet apart in localized areas, consider patching or overlaying.	PPA, MFG	After inspection report identifies need for corrective action
8	Repair of cracks in asphalt surface where more than 100 linear feet of cracks are noted within a 320 square foot area. Permanently isolate damaged area from traffic or loading OR repair by removing damaged area and replacing with low permeability asphalt patch.	PPA, MFG	After inspection report identifies need for corrective action
9	Inspect previously repaired cracks and repair as needed.	MFG	Quarterly
10	Submit a corrective action plan to regulatory agencies for all repairs to low permeability asphalt including scope, methods and schedule of proposed repairs.	Proposed	After inspection report identifies need for corrective action

TABLE 2-1: ASPHALT CAP OPERATION AND MAINTENANCE REQUIREMENTS
 Taylor Lumber and Treating Superfund Site
 Sheridan, Oregon

Activity	Description	Required By	Frequency
11	Perform oversight and approval of cap inspection and repairs by a qualified person.	PPA, MFG	As required
12	Submit a corrective action report documenting all repairs to manufacturer and regulatory agencies.	MFG	After completion of approved repairs
13	Dispose of asphalt and subgrade materials from patch and repair activities.	Proposed	As required
14	Maintain pavement striping and lettering on barrier wall centerline.	Proposed	As required
15	Clean out debris from concrete trench drains. ¹	Proposed	Semi-Annual, or as required after storm events
16	Clean debris from top of trench drain grates ¹	Proposed	As required after storm events
17	Documentation/reporting of disposal of filter cake and sediment removed from SWTS and debris from trench drains.	Proposed	Annual
18	Inspect and re-tighten extraction well vault cover bolts.	Proposed	Semi-Annually if extraction well use and inspections are discontinued.

PPA = O&M activity required by Prospective Purchaser Agreement

MFG = O&M activity required by manufacturer's warranty or product specific O&M requirements

Notes:

1. Clean out of debris and sediment from trench drains in support of a properly functioning remedy is also a routine maintenance requirement for proper functioning of the stormwater conveyance system, necessary for the collection of stormwater for treatment and discharge under the NDPES permit.

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Subsurface Barrier Wall Operation and Maintenance Requirements

This section provides a summary of operation and maintenance requirements for the subsurface barrier wall.

3.1 Subsurface Barrier Wall Construction

The subsurface barrier wall system was constructed in 2000 as part of an EPA Interim Action. The barrier wall system consists of two primary components that work together with the low-permeability asphalt cap to meet the RA objectives for the area as a whole. These two components include a soil-bentonite barrier wall and a protective cap. Each of these components is described below.

Barrier Wall

The soil-bentonite barrier wall is 2,040 feet long and encompasses an area of 6.05 acres around the Treatment Plant area (CH2M HILL, 2006a). The primary purpose of this component of the barrier wall system is to contain dense-non-aqueous-phase liquid (DNAPL) and prevent further migration.

The depth of the barrier wall between the ground surface and the top of the siltstone ranges from 14 to 20 feet. The siltstone beneath the TLT site functions as an aquitard. The barrier wall is keyed into the siltstone to minimize seepage along the bottom of the wall. The depth of the key is 2 feet into the siltstone or to the point of refusal. The barrier wall was constructed to a thickness of 30 inches (CH2M HILL, 2006a). The backfill soil consisted of a mixture of bentonite and clean off-site soil such that the permeability of the wall was designed to be less than 1×10^{-7} cm/sec.

Protective Cap

A protective cap was installed over the top of the barrier wall to protect the wall from heavy equipment traffic. The cap consists of base aggregate a minimum of 30 inches thick by 8.5 feet wide. An additional 2.5 feet of width were added to the as-built cap with a 1:1 slope on the side walls, for a total minimum cap width of 13.5 feet (see Figure 3-1). The base and walls of the cap trench were covered with a low permeability geosynthetic clay liner (specified at 4×10^{-12} cm/sec) that was overlain by a subgrade stabilization geotextile, which in turn was overlain by the compacted base aggregate. The asphalt cap was constructed over this protective cap.

3.2 Requirements of the Record of Decision

The Record of Decision (ROD) for the TLT site (EPA, 2005) requires operation and maintenance of the subsurface barrier wall. Section 12.1 of the ROD requires that "An

Operation and Maintenance Plan for the Barrier Wall System shall be prepared. This plan will include a periodic evaluation of the long-term effectiveness and protectiveness of the barrier wall system." Section 5.5.4 of the ROD notes that "Studies in and around the barrier wall indicate that the soil-bentonite slurry wall is effectively containing DNAPL and groundwater contaminants. DNAPL does not occur outside the barrier wall. As long as the barrier wall, groundwater extraction wells, and cap are functioning as designed, potential sources of contamination to groundwater (DNAPL and contaminated groundwater inside the barrier wall) are physically and hydraulically contained."

Based on the requirements of the ROD cited above, an operation and maintenance plan for the barrier wall is required, and periodic evaluations must be conducted to ensure that the DNAPL and groundwater are contained within the barrier wall. Section 3.3 provides proposed requirements for periodic evaluation of the effectiveness of the subsurface barrier wall, and other operations and maintenance requirements.

3.3 Proposed Operation and Maintenance Requirements

The subsurface barrier wall system is a passive containment system that, by design, requires little long-term operation and maintenance. However, the long-term effectiveness of the barrier needs to be assessed through periodic performance monitoring to ensure that the integrity of the barrier is intact and that the wall is functioning as intended.

As set forth in the ROD, the remedy was designed to achieve the following RAOs established for groundwater: prevent migration of the DNAPL and contaminated groundwater to outside of the barrier wall; restrict human exposure to groundwater with contaminant concentrations that exceed federal drinking water standards both inside and outside the barrier wall (e.g., institutional controls); and, minimize future migration of contaminated groundwater to adjacent surface water to protect ecological receptors.

In addition to performance monitoring, the long-term effectiveness of the barrier is contingent upon operation of the facility in a manner that does not disturb the barrier wall or otherwise compromise the integrity of the wall. Table 3-1 provides a summary of proposed performance monitoring and operation and maintenance activities related to the barrier wall.

Barrier Wall Performance Monitoring

The purpose of long-term performance monitoring is to ensuring the integrity and function of the barrier through evaluation of groundwater analytical data and hydraulic head data. The long-term effectiveness of the barrier at preventing migration of dissolved phase contaminants and DNAPL should be assessed through periodic groundwater level monitoring and analytical sampling. Each of these components is discussed below.

Groundwater Level Monitoring

The purpose of groundwater level monitoring is to ensure that the barrier wall is functioning as intended, and that the groundwater extraction wells are maintaining an inward hydraulic gradient. Groundwater level monitoring at monitor wells inside and outside of the barrier wall will be used to determine that an inward hydraulic gradient is

being maintained within the barrier wall through groundwater extraction. A site specific Field Sampling Plan (FSP) will identify specific wells to be monitored and the frequency of monitoring. Rationale will also be provided for adjusting the frequency of monitoring based on future results.

Groundwater Analytical Sampling

Periodic groundwater analytical sampling will be conducted to evaluate the performance of the barrier wall in preventing further migration of both DNAPL and dissolved phase groundwater contaminants. Specific groundwater sampling requirements (e.g., identification of specific monitor well locations within the barrier wall and down gradient, laboratory analyte list/methods and frequency) will be detailed in a site-specific FSP. Groundwater sampling data have been collected at the site for many years, and are summarized in the RI/FS and the ROD. Comparison of current data to previous sampling data collected after installation of the barrier wall will allow an appropriate sampling frequency to be established. If little or no change from prior sampling events is evident, less frequent future monitoring would be warranted. If significant change is evident, then a higher sampling frequency would be needed. At a minimum, groundwater sampling should be conducted in conjunction with 5 year reviews. If future sampling events show changing conditions in dissolved phase groundwater contaminants down gradient of the barrier wall, an increased frequency of sampling and/or further evaluation of barrier wall integrity would be needed.

Barrier Wall Operation and Maintenance Requirements

The primary operational consideration for the subsurface barrier wall and protective cap is ensuring that the integrity of the system is not compromised by future industrial activities at the site. The most likely disturbance of the barrier wall or protective cap is through installation or repair of site utilities. Any future underground construction activities that require penetration of the barrier wall or disturbance of the protective cap will require repair of the barrier wall or protective cap in a manner that maintains the integrity of the barrier. Backfill materials placed after disturbance of the wall must meet an equivalent permeability performance standard of 1×10^{-7} cm/sec.

TABLE 3-1: SUBSURFACE BARRIER WALL OPERATION AND MAINTENANCE REQUIREMENTS
Taylor Lumber and Treating Superfund Site
Sheridan, Oregon

Activity	Description	Required By	Frequency
1	Periodic Groundwater Analytical Sampling	Proposed	Every 5 years ¹
2	Periodic Groundwater level monitoring	Proposed	Annual
3	Barrier wall repair and reconstruction	Proposed	As required ²
4	Barrier wall protective cap repair and reconstruction	Proposed	As required ²

Notes:

1. Groundwater analytical sampling frequency may be adjusted based on results of previous monitoring event(s).
2. Repair and/or replacement of sections of the barrier wall and protective cap disturbed or compromised (e.g. underground utility installation) is required. Repair and replacement must be done to equivalent performance standards for hydraulic conductivity.

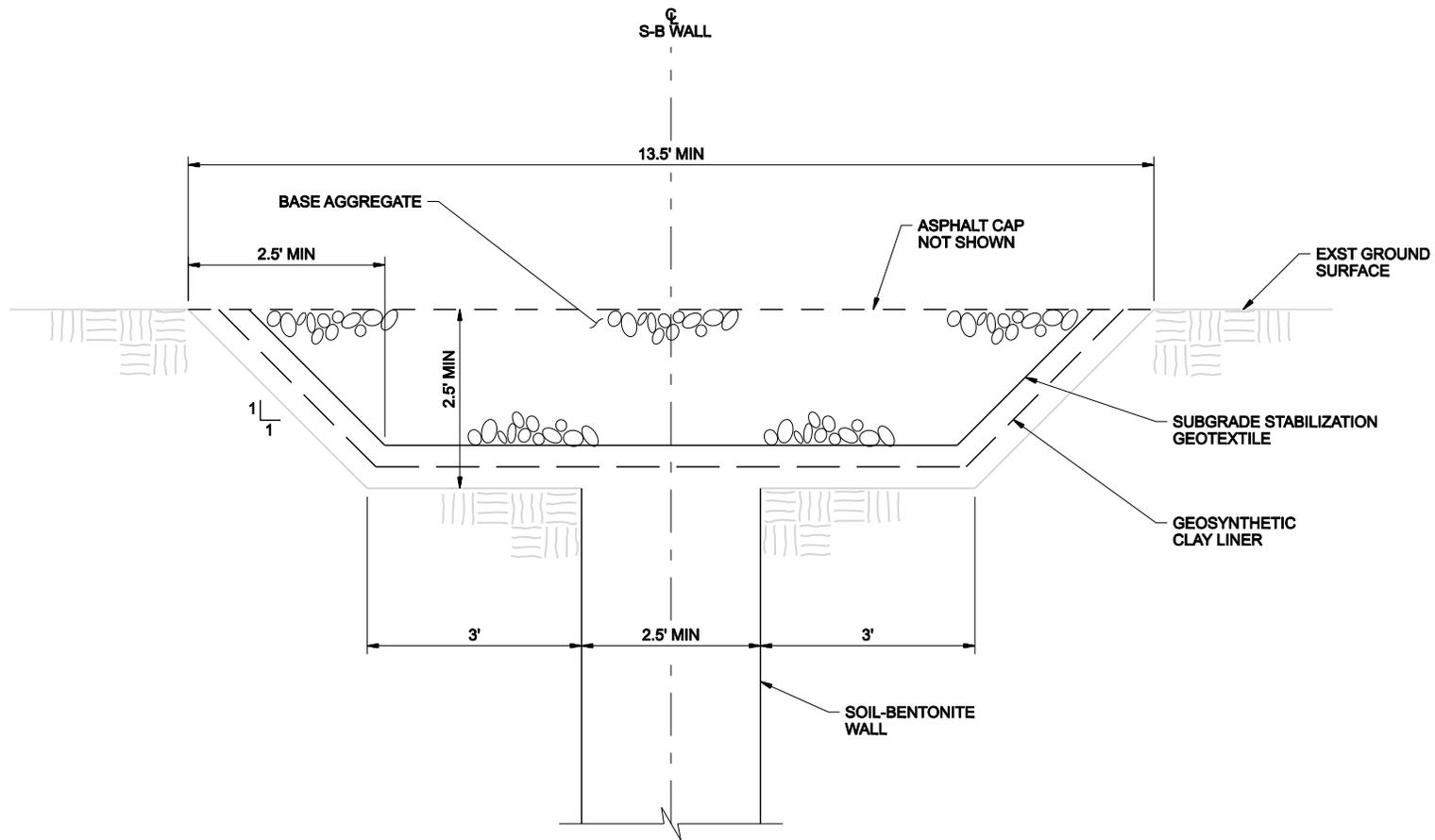


FIGURE 3-1
BARRIER WALL PROTECTIVE CAP DETAIL
 TAYLOR LUMBER AND TREATING SUPERFUND SITE

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Groundwater Extraction System Operation and Maintenance

4.1 Groundwater Extraction System Construction

The groundwater extraction system consists of four 6-inch-diameter groundwater extraction wells with pneumatic pumps installed within the barrier wall to induce an inward hydraulic gradient and to prevent the water level from rising above the protective cap over the barrier wall. The groundwater extraction system is designed to keep the groundwater elevation at or below 3-feet below ground surface (Ecology and Environment 2000). PWPO estimates that the total groundwater recovery rate can be as high as 360 gallons per day, depending on the season. The groundwater discharge pipes and air supply pipes are routed underground (18-inch minimum depth) to the closest wastewater receiving tanks or sumps and air supply outlets at the site, where it is conveyed to the SWTS. The groundwater extraction wells, and associated piping, are shown on As-Built Drawing C-2, Existing Underground Utilities Plan (Appendix B).

Control of the groundwater elevation within the barrier wall is important to ensure the structural stability of the asphalt cap, and must be regularly monitored. If the groundwater elevation rises too close to the surface (for example, because of a leaking water line or a malfunctioning extraction pump), the weight-bearing capacity of the surface diminishes and the cap can fail under the heavy loads used in the area.

For at least two years (summer 2007 through July 2009), it appears that there has been a leak from a subsurface water line that is located within the slurry wall. In 2007, PWPO shut off the water valves feeding the fire hydrant outside the wall, because they knew it was leaking. However, in July 2009, PWPO discovered that one of the valves had been inadvertently turned back on causing a continued leak from the line. PWPO shut off the valves associated with the fire hydrant inside the wall in July of 2009 (EPA, 2009 and PWPO, 2009a). In August 2009, PWPO indicated that the latter action reduced the flow of water in the trench drain to a normal level, and returned the pumping rate of the extraction wells to a normal level. This issue should be monitored in the future to ensure that the water line is fixed if the valves are turned back on as a higher than normal water table could adversely affect the asphalt, and it contributes more water to the SWTS that must be treated by PWPO.

Background information (Ecology and Environment 2000, 2001) on the extraction wells is provided in Appendix F.

4.2 Requirements of the PPA

The PPA requires that PWPO personnel perform inspections of the groundwater extraction. These O&M requirements are as follows:

1. Visually inspect each well vault and ensure that all piping is intact and is not leaking. If any piping is leaking, the pump shall be shut off and the piping be repaired immediately.
2. Visually confirm that water is being pumped through the effluent lines. To check wells PW-1 and PW-2, PWPO shall attach a hose to the ball valve and pump the effluent into a container. Since wells PW-2 and PW-3 each discharge into a sump pit, verification can be achieved by witnessing the effluent discharge. If a pump is not functioning, PWPO shall identify the problem and repair the pump as soon as possible.
3. Record the air pressure setting for each pump. The air pressure should be set between 65 and 70 pounds per square inch.
4. Record the time required for three pump cycles and calculate the flow rate.
5. A record of each inspection must be prepared and filed onsite. The inspection records shall be made available to EPA or EPA's authorized representatives upon request. The record shall include the following:
 - a) The time and date of each inspection.
 - b) The name of the person performing the inspection.
 - c) The time required for each pump to go through three pumping cycles.
 - d) Calculations of the flow rate for each pump.
 - e) The air pressure at the well head of each pump.
 - f) A brief description of any leaks found in the air or water piping.
 - g) A brief description of repairs made to the air or water piping.
 - h) A brief description of problems with a pump.
 - i) A brief description of repairs made to a pump.
 - j) The time and date that any required repairs were performed.
 - k) The name of the person(s) performing the required repairs.
 - l) The time and date of the inspection and final approval of required repairs.
 - m) The name of the person who inspected and approved the repairs.
6. In the event that the extraction system is expanded or modified for remediation purposes, PWPO will operate and perform maintenance on the new or modified extraction system. [During the renewal process for PWPO's National Pollutant Discharge Elimination System (NDPES) permit, EPA approved the management of the extracted groundwater through the stormwater treatment system as an acceptable alternative.]
7. These activities shall be performed until January 31, 2022, or until the groundwater extraction system is no longer necessary to address contamination at the Site, whichever is sooner. If, after January 31, 2022, the groundwater extraction system is still necessary, EPA and PWPO shall negotiate in good faith an arrangement for the continued operation of the groundwater extraction system.

4.3 Proposed Modifications to the PPA

EPA is responsible for modifying the PPA and obtaining PWPO and ODEQ approval of the changes. EPA anticipates that the PPA modifications will be submitted to PWPO and ODEQ by December 2009. These proposed changes are discussed in this section.

The primary changes related to the PPA requirements for O&M of the groundwater extraction system are to clarify the required frequency of inspection, maintenance and reporting activities. Specifically, the PPA does not specify a frequency for items 1 through 4 listed in Section 4.2. Proposed frequencies for these tasks are listed in Table 4-1 below.

EPA is also proposing to clarify the procedure for calculating flow measurements from the four extraction wells. Based on observation and review of PWPO procedures for measuring the extraction well flow rates, EPA proposes the following be added to the PPA:

1. Open vault cover
2. Attach discharge hose to discharge manifold
3. Adjust valve settings to divert flow from conveyance pipe to discharge hose
4. Time a minimum of three pump discharge cycles
 - Start the stop watch when you hear pump discharge cycle 1.
 - Listen for pump discharge cycles 2, 3, and 4. Stop the stop watch at pump cycle 4, and record the time that passed from cycle 1 through cycle 4 (which is three pump cycles).
5. Measure flow collected in bucket using 1 gallon graduations marks on bucket
6. Divide flow collected (gallons) by time (minutes) for a minimum of three pump cycles to determine flow rate (gallons/minute)
7. Check pressure gauge and record reading in psi. Adjust if the pressure is not within the specified range
8. Adjust valve settings to divert flow from discharge hose back to conveyance pipe
9. Remove temporary hose from discharge manifold
10. Replace vault cover

An additional method for determining the flow rate from the extraction wells is to use the pump manufacturer's reported discharge volume for each pump stroke to estimate the flow rate by timing the duration of three pump strokes and dividing the theoretical discharge volume (0.53 gallons per stroke x 3 strokes = 1.59 gallons) by the time in minutes for three pump cycles or strokes. This procedure is deemed less accurate than actual measurement of flow volume due to deterioration in pump performance due to wear or fouling from debris.

In addition to these clarifications, EPA is proposing changes to the PPA related to portions of the shared portions of the stormwater conveyance and extracted groundwater conveyance systems, and their impact upon the SWTS. The groundwater extraction system at the TLT site consists of 4 extraction wells installed within the perimeter of the barrier wall. Groundwater extracted from each of these wells is conveyed through underground piping to the SWTS where it is treated prior to discharge. PWPO operates the SWTS under NPDES Waste Discharge Permit Number 101267 (see Appendix G). On June 3, 2009, PWPO submitted a renewal application to ODEQ for this permit, which is set to expire on

November 30, 2009. This permit allows discharge of stormwater, boiler blowdown and extracted groundwater only.

NPDES Permit No. 101267 specifies that:

“The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls, and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.”

In fulfillment of this requirement, operations and maintenance of the STWS was originally outlined in the *Operations and Maintenance Manual for the Stormwater Treatment System*, which appears to have been approved by EPA and ODEQ. This document, and preceding correspondence, is provided in Appendix H. A detailed analysis of the existing stormwater treatment system operations conducted in 2006, is provided in Appendix G.

The groundwater extraction system has been operated and maintained by PWPO in accordance with the NPDES permit since they purchased the property and took over operations. During this time period, minimal changes have been made to the system layout and O&M activities and PWPO has not updated or modified the O&M manual. In correspondence to Karen Keeley/EPA on July 24, 2009, Roland Mueller/PWPO indicated that PWPO’s maintenance supervisor implements operations and maintenance requirements for the stormwater treatment system in accordance with the requirements of the NPDES permit (PWPO, 2009b). Mr. Mueller also indicated that the operation and maintenance procedures implemented by PWPO are similar to those in the manual approved for Taylor Lumber, but PWPO does not have a formal written operation and maintenance plan.

EPA has identified an O&M issue related to the contribution of sediments and contaminants from groundwater extraction and surface water runoff from the asphalt cap. This sediment load contributes to required maintenance of the onsite stormwater treatment system.

Routine operation of the stormwater treatment system requires periodic cleanout of sediment from the following locations:

1. oil water separators in front of the wet well
2. wet well
3. 500,000 gallon storage tank
4. two mix tanks
5. four sedimentation tanks
6. surge tank
7. filter bag canisters

In addition to the cleanout of sediment, the activated carbon in the adsorption columns needs to be changed out periodically to prevent breakthrough of contaminants. Accumulated sediments and filter cake generated by the SWTS must be properly disposed

of, and may not be dumped or land applied on site. ODEQ clarified this requirement in a letter dated May 29, 2007 (ODEQ, 2007). In February 2007, PWPO indicated, in correspondence to Karen Keeley/EPA, that the oil water separators, the wet well, and the 500,000 gallon storage tank were completely cleaned out for the first time in 2006. The other components of the stormwater treatment system had been cleaned annually and the activated carbon had been changed out two times. EPA is proposing that the PPA be modified to explicitly state that PWPO inspection records should be made available to EPA, ODEQ, or their authorized representatives upon request. EPA also proposes that specific timeframes be established for maintenance of equipment and systems when a component of system fails or is inoperable (e.g., extraction well pump is inoperable). These proposed timeframes are included in Table 4-1 below, which provides a brief summary of O&M plan requirements for the groundwater extraction system.

TABLE 4-1: GROUNDWATER EXTRACTION SYSTEM OPERATION AND MAINTENANCE REQUIREMENTS
Taylor Lumber and Treating Superfund Site
Sheridan, Oregon

Activity	Description	Required By	Frequency
1	Operation and Maintenance Report.	Proposed	Annual
2	Visual Inspection of well vaults and piping to detect leaks.	PPA Proposed	Not Specified (Weekly)
3	Visual inspection to confirm that water is being pumped through the effluent lines.	PPA Proposed	Not Specified (Weekly)
4	Record air pressure setting for each pump.	PPA Proposed	Not Specified (Monthly)
5	Record time for three pump cycles and calculate flow rate.	PPA Proposed	Not Specified (Quarterly)
6	Repair/replacement of inoperable equipment or systems	Proposed	14 days
7	Record each inspection and maintain inspection records on site.	PPA	Continuous
8	Perform O&M of any expansions to groundwater extraction system.	PPA	As required
9	Clean out of sediment from the SWTS.	Proposed	As required
10	Change out of activated carbon in adsorption towers prior to contaminant breakthrough.	Proposed	As required

SECTION 5

Documentation and Reporting

This section provides a summary of documentation and reporting requirements for O&M of the final remedy. Table 5-1 provides a summary of reporting requirements. O&M reports will be prepared annually by ODEQ and its contractors. Copies of the O&M reports will be provided to EPA. The annual O&M reports will be summarized in the Five-Year Review Reports that will be prepared by the ODEQ pursuant to EPA's Comprehensive Five-Year Review Guidance (EPA 540-R-01-007, June 2001). Concurrence by both the ODEQ and EPA will be required for each Five-Year Review Report. EPA 540-R-01-007 (Section 1.3.1, page 1-5) states:

"For the purpose of a five-year review, a remedial action typically is initiated on the date of 'actual RA on-site construction' or the 'actual RA start' date for Federal facilities. The date of actual RA on-site construction generally corresponds to the date the contractor begins work at a site for the remedial action, typically the date of on-site mobilization."

Based on the mobilization date for the RA construction work performed in 2007, the first Five-Year Review Report that includes O&M reporting will be issued by May 15, 2012

Table 5-1 summarizes documentation and reporting requirements associated with O&M of the final remedy at the TLT site. Figure 5-1 provides a schedule for the first 10 years of O&M activities.

TABLE 5-1: OPERATION AND MAINTENANCE DOCUMENTATION AND REPORTING REQUIREMENTS
Taylor Lumber and Treating Superfund Site
Sheridan, Oregon

Activity	Description	Required By	Prepared By:	Submitted To:	Frequency
1	Annual O&M Reports	ODEQ	ODEQ	EPA	Annual
2	Annual Asphalt Inspection Report (through 2012)	MFG	MFG	ODEQ, EPA	Annual
3	Annual Asphalt Inspection Report (2013 and beyond)	Proposed	ODEQ	EPA, PWPO	Annual
4	Five-Year Review Reports	CERCLA	ODEQ	EPA	Every 5 Years

5.1 Asphalt Cap Operation and Maintenance

The periodic cap inspections will be conducted according to the PPA and product-specific O&M and warranty requirements of the as-built cap. A cap inspection form is provided in Appendix D. An annual report including the inspection form and any supporting documentation and photographs will be sent to the appropriate regulatory contacts described in this section. The first annual asphalt cap inspection was performed on August 11, 2008. The annual inspection report for this activity is provided as Appendix I.

5.2 Groundwater Extraction System Operation and Maintenance

The periodic groundwater extraction system inspections and O&M activities will be conducted according to the PPA. An annual report including the inspection form and any supporting documentation and photographs will be sent to the appropriate regulatory contacts described in this section.

5.3 Contact Information

This section provides contact information for individuals with responsibility for coordination and inspection of inspection and maintenance activities. For the first year following construction, the person responsible for coordinating inspection and maintenance activities is the EPA remedial project manager (RPM):

Name: U.S. EPA Region 10 – Karen Keeley, RPM
Address: 1200 Sixth Avenue, Suite 900, ECL-111
City, State, Zip: Seattle, WA 98101
Telephone: (206) 553-2141

After one year of operation (September 30, 2009), O&M oversight will be transferred to ODEQ. The ODEQ contact for the TLT site is:

Name: Oregon DEQ – Norman Read
Site Manager
Address: 165 East 7th Avenue, Suite 100
City, State, Zip: Eugene, OR 97401
Telephone: (541) 687-7348

Contact information for the low-permeability asphalt cap manufacturer's representatives is:

Name: Granite Construction Company – Jerry Thayer
Address: 1525 East Marine View Drive
City, State, Zip: Everett, WA 98201
Telephone: (425) 239-3332

Name: Abatech Inc. – Geoffrey Rowe
Address: 1274 Rt. 113 P.O. Box 356
City, State, Zip: Blooming Glen, PA 18911
Telephone: (215) 258-3640

Contact information for the groundwater extraction well pump manufacturer's representative is:

Name: QED West Coast Service Center
Address: 1565 Alvarado Street
City, State, Zip: San Leandro, CA 94577
Telephone: 1-800-537-1767
Email: Info@qedenv.com
Website: <http://qedenv.com>

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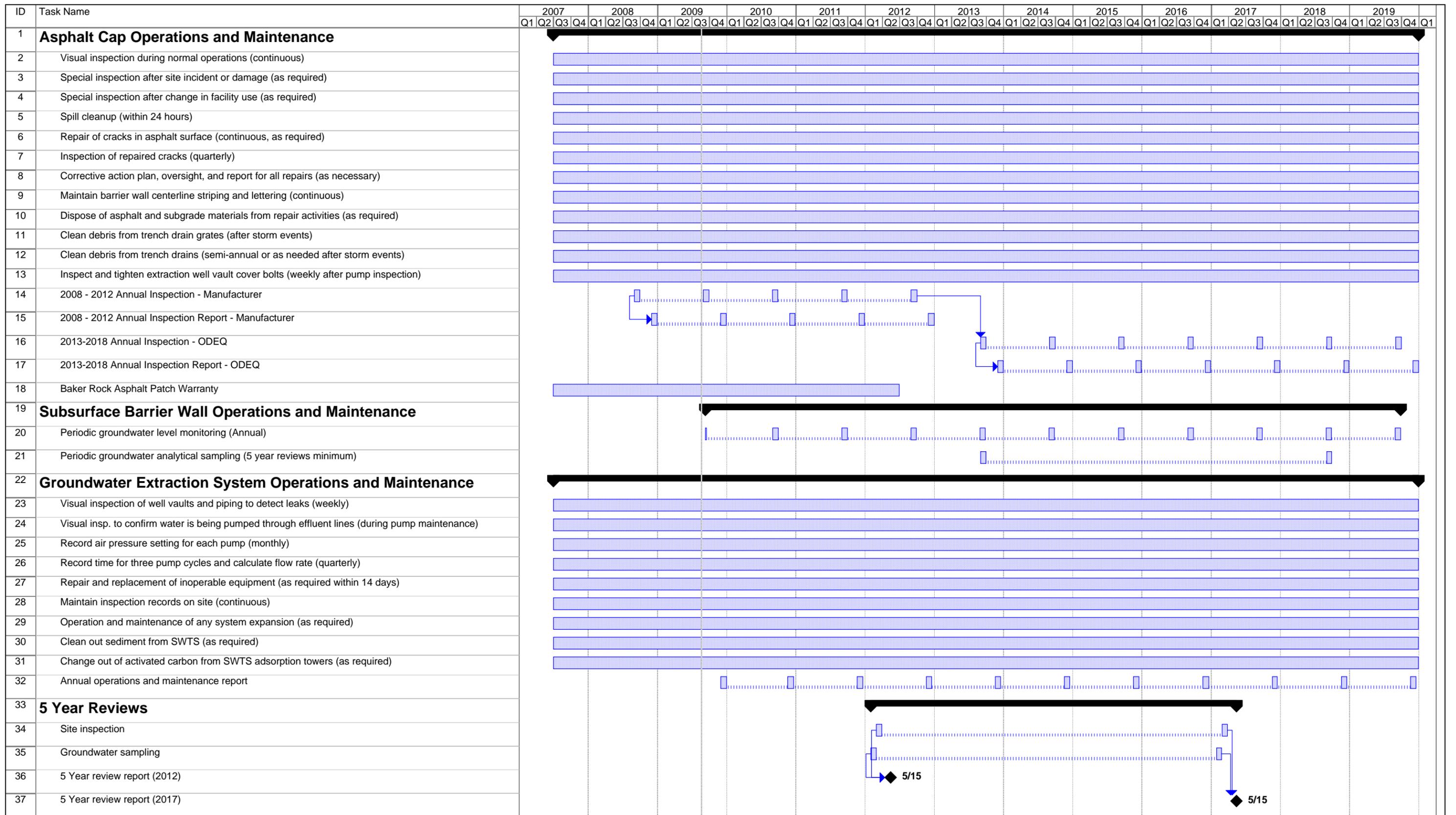


Figure 5-1
10 Year O&M Schedule
 Taylor Lumber and Treating Superfund Site

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SECTION 6

Operation and Maintenance Costs

As part of the operation and maintenance plan, preliminary estimates of annual O&M are provided. Estimates of these costs were provided by EPA in an email correspondence to ODEQ on December 7, 2006 (EPA, 2006). Annual O&M cost for the remedy are estimated at approximately \$68,000. The reported accuracy of these costs is estimated to be on the order of +50/-30%. Actual costs will vary depending on actual market conditions and will also be impacted by how the operation and maintenance activities are staffed and performed. A breakdown of these estimated costs is provided in Appendix J.

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SECTION 7

Health and Safety Requirements

Health and safety requirements for performing O&M work at the site are subject to common industry standards (i.e. Occupational Safety and Health Administration [OSHA] requirements) and are also subject to the site procedures and requirements established by PWPO in the facilities health and safety plan.

Specific health and safety requirements for routine inspections will typically be outlined in a Health and Safety Plan (HSP) that includes all field activities, and is reviewed by all personnel prior to performing the work. The HSP will generally specify appropriate personal protective equipment (PPE) and safe work procedures for performing each task.

These health and safety plan requirements are typically subject to specific contractual requirements set forth by the agency contracting the work (e.g., EPA or ODEQ) as well as internal health and safety requirements and standard operating procedures implemented by the entity performing the work (i.e., contractors and subcontractors).

In addition to general health and safety requirements, additional requirements apply to working on a site with hazardous contaminants. Soil contamination beneath the cap may exceed acceptable concentrations for an industrial worker exposure scenario (CH2M HILL, 2004). In the event that work is required below the asphalt cap and associated base course, the contractor performing the work must meet additional requirements including, but not limited to, providing OSHA 40-hour trained personnel and providing a Health and Safety Plan consistent with nature of the work to be performed. Specific requirements of the health and safety plan are subject to review and approval by the contracting agency.

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SECTION 8

Conditions for Operation and Maintenance Termination

Operations and maintenance activities may be terminated when the remedial measures that currently require operation and maintenance are no longer necessary to meet the RAOs. However, the RI indicated that this remedy likely will require O&M to be performed indefinitely.

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SECTION 9

References

- Baker Rock Resources, 2008. *Warranty Agreement for Pavement Repair*. December 18, 2007. Baker Rock Resources, McMinnville, OR.
- CH2M HILL, 2004. *Remedial Investigation/Feasibility Study Report, Taylor Lumber and Treating Superfund Site, Sheridan, Oregon*. December 2004.
- CH2M HILL. 2006a. *Taylor Lumber and Treating Superfund Site: Final Design Basis Report*. CH2M HILL, Corvallis, Oregon. December 2006.
- CH2M HILL. 2006b. *Taylor Lumber and Treating Superfund Site: Final Design Drawings*. CH2M HILL, Corvallis, Oregon. December 2006.
- CH2M HILL. 2006c. *Taylor Lumber and Treating Superfund Site: Final Design Specifications*. CH2M HILL, Corvallis, Oregon. December 2006.
- CH2M HILL 2006d. *Technical Memorandum: TLT Pavement Testing – July 27 to August 3, 2006, Taylor Lumber and Treating Superfund Site, August 10, 2006*. CH2M HILL, Corvallis, Oregon.
- CH2M HILL. 2008. *Memorandum: Taylor Lumber and Treating Site Visit - Asphalt*. August 11, 2008 CH2M HILL, Corvallis, Oregon.
- CH2M HILL. 2009a. *Taylor Lumber and Treating Superfund: Final Construction Report*. March 31, 2009 CH2M HILL, Corvallis, Oregon.
- CH2M HILL. 2009b. *Taylor Lumber and Treating Superfund: Final As-Built Drawings*. March 31, 2009 CH2M HILL, Corvallis, Oregon.
- Ecology and Environment. 2000. *Letter to Beth Sheldrake, EPA, Draft Groundwater Extraction System Operation and Maintenance Plan*. November 6, 2000.
- Ecology and Environment. 2001. *Final Removal Action Report, Taylor Lumber and Treating, Sheridan, Oregon TDD:09-00-09-0015*. Prepared by Ecology and Environment for U.S. EPA. January 2001.
- EPA 2001. *Comprehensive 5 Year Review Guidance, EPA 540-R-01-007, Office of Emergency and Remedial Response, United States Environmental Protection Agency, Washington DC, June 2001*.
- EPA 2002. *Prospective Purchaser Agreement, Taylor Lumber and Treating Site, Sheridan, Oregon. Region 10. Docket CERCLA-10-2002-0034*. May 15, 2002.
- EPA 2004. *Final Record of Decision, Taylor Lumber and Treating Superfund Site, Sheridan, Oregon. Region 10. September 30, 2005*.
- EPA 2006. *Letter from Beth Sheldrake/EPA to Alan Kiphut/ODEQ, December 7, 2006*.

EPA, 2009. Email correspondence from Karen Keeley/EPA to Sheldon Stewart/PWPO regarding water line leak within barrier wall. August 25, 2009.

Granite Construction. 2009. *MatCon Operation and Maintenance Plan, Rev 4*. August, 2009. Wilder Construction Company, Everett, WA.

ODEQ, 2007. Letter from Susan Shewczyk /ODEQ to Bob Halderman and Randy Austin/PWPO, May 29, 2007.

PWPO, 2009a. Email correspondence from Sheldon Stewart/PWPO to Karen Keeley/EPA, regarding shut off of water line. August 27, 2009.

PWPO, 2009b. Email correspondence from Roland Mueller to Karen Keeley/EPA, July 24, 2009.

Wilder Construction. 2008. *MatCon Material and Workmanship Warranty*. May 29, 2008. Wilder Construction Company, Everett WA.

A Prospective Purchasers Agreements

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1 2. This Agreement is entered into pursuant to the Comprehensive Environmental
2 Response, Compensation, and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C.
3 § 9601, *et seq.*, and the authority of the Attorney General of the United States to compromise
4 and settle claims of the United States.

5 3. This Agreement concerns the Taylor Lumber & Treating, Inc. ("Taylor Lumber")
6 Site in Sheridan, Oregon. The Taylor Lumber Site contains a wood-processing and wood-
7 treating business. Contaminants present at the Site include, among others, pentachlorophenol
8 (PCP), arsenic and other heavy metals, and PAHs (polycyclic aromatic hydrocarbons). These
9 contaminants, found in soil, surface water, ground water, and air, were released at the Taylor
10 Lumber Site over years of wood-treating operations. Taylor Lumber & Treating Inc. filed a
11 voluntary petition for relief pursuant to Chapter 11 of the U.S. Bankruptcy Code on June 11,
12 2001, in the United States Bankruptcy Court, District of Oregon.

13 4. The Settling Respondent, Pacific Wood Preserving of Oregon ("PWPO"), is a
14 corporation registered in Nevada. PWPO's corporate headquarters are located at 5601 District
15 Blvd., Bakersfield, CA 93313. PWPO is purchasing the treatment plant portion of the Taylor
16 Lumber Site, for continued use as a wood treatment business. This purchase takes place under
17 the supervision and with the approval of the U.S. Bankruptcy Court.

18 5. The Parties agree to undertake all actions required by the terms and conditions of
19 this Agreement. The purpose of this Agreement is to settle and resolve, subject to
20 reservations and limitations contained in Sections IX, X, XI, and XII the potential liability of
21 the Settling Respondent under Section 107 of CERCLA, 42 U.S.C. § 9607, for the Existing
22 Contamination at the Property that would otherwise result from Settling Respondent
23 becoming the owner or operator of the Site. In furtherance of the purposes of this Agreement,
24 EPA agrees not to assert that Settling Respondent is a successor-in-interest to Taylor Lumber
25 & Treating, Inc. pursuant to the Resource Conservation and Recovery Act, including but not
26 limited to the requirements of Consent Decree (Civil Action No. 93-858-JO) or EPA
27 Administrative Order On Consent (Docket No. 10-94-0244-RCRA).

1 Exhibit 2. The Site shall include the Property and all areas to which hazardous substances,
2 pollutants, or contaminants have come to be located.

3 g. "United States" shall mean the United States of America, its departments,
4 agencies, and instrumentalities.

5 6 III. STATEMENT OF FACTS

7 9. Taylor Lumber & Treating Inc. filed a voluntary petition for relief pursuant to
8 Chapter 11 of the U.S. Bankruptcy Code on June 11, 2001, in the United States Bankruptcy
9 Court, District of Oregon ("the Bankruptcy Court"). As a part of the Bankruptcy proceedings,
10 Taylor Lumber is selling its treating business.

11 10. Settling Respondent entered into an Asset Purchase Agreement with Taylor
12 Lumber dated December 13, 2001, to purchase certain assets from Taylor Lumber, including
13 the Property. The Bankruptcy Court approved the sale to PWPO by Order dated December
14 20, 2001.

15 11. Settling Respondent intends to conduct a business at the Property that involves
16 the treatment of lumber products and poles with preservatives that have relatively low
17 environmental impact and toxicity and are distinguishable from preservatives presently on the
18 Site.

19 12. The Settling Respondent represents, and for the purposes of this Agreement EPA
20 relies on those representations, that Settling Respondent has had no involvement with the
21 Property or the Site.

22 23 IV. PAYMENT

24 13. In consideration of and in exchange for the United States' Covenant Not to Sue in
25 Section X herein and Removal of Lien in Section XXII herein, Settling Respondent agrees
26 that EPA shall receive the sum of \$500,000. Payment shall be made by either the Settling
27 Respondent or by the Taylor Lumber estate with the approval of the Bankruptcy Court. All
28

1 payments required by this Agreement shall be made in the form of a certified check or checks
2 made payable to "EPA Hazardous Substance Superfund," referencing the EPA Region 10
3 Docket number, Site/Spill ID #10F1, and name and address of Settling Respondent. All
4 payments made shall be deposited into the Taylor Lumber and Treating Special Account
5 within the EPA Hazardous Substance Superfund. Payment(s) shall be sent to Mellon Bank,
6 EPA-Region 10, Attention Superfund Accounting, P.O. Box 360903M, Pittsburgh, PA
7 15251. Notice of payment shall be sent to those persons listed in Section XVII (Notices and
8 Submissions) and to EPA Region 10 Financial Management Officer, U.S. Environmental
9 Protection Agency, 1200 Sixth Avenue, OMP-146, Seattle, WA 98101. Amounts paid by
10 Settling Respondent under this Agreement and deposited into the Taylor Lumber and Treating
11 Special Account shall be retained and used to conduct or finance response actions at or in
12 connection with the Site, or transferred by EPA to the EPA Hazardous Substance Superfund.
13

14 V. WORK TO BE PERFORMED

15 14. In further consideration of and in exchange for the United States' Covenant Not to
16 Sue in Section X herein and Removal of Lien in Section XXII herein, Settling Respondent
17 agrees to operate and maintain a groundwater extraction and disposal system, to maintain the
18 existing asphalt covers, and to maintain the contaminated soil storage cells. The Work to Be
19 Performed is described fully in the Statement of Work attached as Exhibit 3.
20

21 VI. LIMITATIONS ON USE OF PROPERTY

22 15. In further consideration of and in exchange for the United States' Covenant Not
23 to Sue in Section X herein and Removal of Lien in Section XXII herein, Settling Respondent
24 agrees that, in conducting its wood-treating business, Settling Respondent shall not treat wood
25 with solutions containing ACZA (ammoniacal copper zinc arsenate), CCA (copper chromated
26 arsenate), pentachlorophenol, creosote, or any arsenical wood-preserving compounds.
27
28

1 VII. ACCESS/NOTICE TO SUCCESSORS IN INTEREST

2 16. Commencing upon the date that it acquires title to the Property, Settling
3 Respondent agrees to provide to EPA, its authorized officers, employees, representatives, and
4 all other persons performing response actions under EPA oversight, an irrevocable right of
5 access at all reasonable times to the Property and to any other property to which access is
6 required for the implementation of response actions at the Site, to the extent access to such
7 other property is controlled by the Settling Respondent, for the purposes of performing and
8 overseeing response actions at the Site under federal law. EPA agrees to provide reasonable
9 notice to the Settling Respondent of the timing of response actions to be undertaken at the
10 Property. Notwithstanding any provision of this Agreement, EPA retains all of its access
11 authorities and rights, including enforcement authorities related thereto, under CERCLA, the
12 Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, 42
13 U.S.C. § 6901, ("RCRA") *et seq.*, and any other applicable statute or regulation, including any
14 amendments thereto.

15 17. With respect to any Property owned or controlled by the Settling Respondent that
16 is located within the Site, within fifteen days after the effective date of this Agreement or the
17 date of acquisition of any Property, whichever date is later, the Settling Respondent shall
18 submit to EPA for review and approval a notice to be filed with the Recorder's Office,
19 Yamhill County, State of Oregon. The notice shall provide notice to all successors-in-title that
20 the Property is part of the Site and that it is subject to this Agreement. The Settling
21 Respondent shall record the notice within 10 days of EPA's approval of the notice. The
22 Settling Respondent shall provide EPA with a certified copy of the recorded notice within ten
23 days of recording such notice.

24 18. The Settling Respondent shall ensure that assignees, successors in interest,
25 lessees, and sublessees of the Property shall provide the same access and cooperation. The
26 Settling Respondent shall ensure that a copy of this Agreement is provided to any current
27 lessee or sublessee on the Property as of the effective date of this Agreement and shall ensure
28

1 that any subsequent leases, subleases, assignments, or transfers of the Property or an interest
2 in the Property are consistent with this Section, Section XIII (Parties Bound/Transfer of
3 Covenant), and Section V (Work to be Performed) of the Agreement.
4

5 VIII. DUE CARE/COOPERATION

6 19. The Settling Respondent shall exercise due care at the Site with respect to the
7 Existing Contamination and shall comply with all applicable local, state, and federal laws and
8 regulations. The Settling Respondent recognizes that the implementation of response actions
9 at the Site may interfere with the Settling Respondent's use of the Property and may require
10 closure of its operations or a part thereof for an unspecified period of time. The Settling
11 Respondent agrees to cooperate fully with EPA in the implementation of response actions at
12 the Site and further agrees not to interfere with such response actions. EPA agrees, consistent
13 with its responsibilities under applicable law, to use reasonable efforts to minimize any
14 interference with the Settling Respondent's operations by such entry and response. In the
15 event the Settling Respondent becomes aware of any action or occurrence which causes or
16 threatens a release of hazardous substances, pollutants or contaminants at or from the Site that
17 constitutes an emergency situation or may present an immediate threat to public health or
18 welfare or the environment, Settling Respondent shall immediately take all appropriate action
19 to prevent, abate, or minimize such release or threat of release, and shall, in addition to
20 complying with any applicable notification requirements under Section 103 of CERCLA, 42
21 U.S.C. §9603, or any other law, immediately notify EPA of such release or threatened release.
22

23 IX. CERTIFICATION

24 20. By entering into this agreement, the Settling Respondent certifies that to the best
25 of its knowledge and belief it has fully and accurately disclosed to EPA all nonpublic
26 information known to Settling Respondent and all nonpublic information in the possession or
27 control of its officers, directors, employees, contractors, and agents which relates in any way
28

1 to any Existing Contamination or any past or potential future release of hazardous substances,
2 pollutants or contaminants at or from the Site and to its qualification for this Agreement. The
3 Settling Respondent also certifies that to the best of its knowledge and belief it has not caused
4 or contributed to a release or threat of release of hazardous substances or pollutants or
5 contaminants at the Site. If the United States determines that information provided by Settling
6 Respondent is not materially accurate and complete, the Agreement, within the sole discretion
7 of the United States, shall be null and void and the United States reserves all rights it may
8 have.

10 X. UNITED STATES' COVENANT NOT TO SUE

11 21. Subject to the Reservation of Rights in Section XI of this Agreement, upon
12 payment of the amount specified in Section IV (Payment) of this Agreement, and conditioned
13 upon performance of the work specified in Section V (Work to Be Performed) to the
14 satisfaction of EPA, and upon compliance by Settling Respondent with its obligations under
15 Section VI (Limitations on Use of Property), Section VII (Access/Notice to Successors in
16 Interest), and Section VIII (Due Care and Cooperation), the United States covenants not to sue
17 or take any other civil or administrative action against Settling Respondent for any and all
18 civil liability for injunctive relief or reimbursement of response costs pursuant to Sections 106
19 or 107(a) of CERCLA, 42 U.S.C. §§ 9606 or 9607(a) with respect to the Existing
20 Contamination.

22 XI. RESERVATION OF RIGHTS

23 22. The covenant not to sue set forth in Section X above does not pertain to any
24 matters other than those expressly specified in Section X (United States' Covenant Not to
25 Sue). The United States reserves and the Agreement is without prejudice to all rights against
26 Settling Respondent with respect to all other matters, including but not limited to, the
27 following:

1 a. claims based on a failure by Settling Respondent to meet a requirement of
2 this Agreement, including but not limited to Section IV (Payment), Section V (Work to Be
3 Performed), Section VI (Limitations on Use of Property), Section VII (Access/Notice to
4 Successors in Interest), Section VIII (Due Care/Cooperation), and Section XVI (Payment of
5 Costs);

6 b. any liability resulting from past or future releases of hazardous substances,
7 pollutants or contaminants, at or from the Site caused or contributed to by Settling
8 Respondent, its successors, assignees, lessees, or sublessees;

9 c. any liability resulting from exacerbation by Settling Respondent, its
10 successors, assignees, lessees, or sublessees, of Existing Contamination;

11 d. any liability resulting from the release or threat of release of hazardous
12 substances, pollutants, or contaminants, at the Site after the effective date of this Agreement,
13 not within the definition of Existing Contamination;

14 e. criminal liability;

15 f. liability for damages for injury to, destruction of, or loss of natural resources,
16 and for the costs of any natural resource damage assessment incurred by federal agencies other
17 than EPA; and

18 g. liability for violations of local, State, or federal law or regulations.

19 23. With respect to any claim or cause of action asserted by the United States, the
20 Settling Respondent shall bear the burden of proving that the claim or cause of action, or any
21 part thereof, is attributable solely to Existing Contamination.

22 24. Nothing in this Agreement is intended as a release or covenant not to sue for any
23 claim or cause of action, administrative or judicial, civil or criminal, past or future, in law or
24 in equity, which the United States may have against any person, firm, corporation or other
25 entity not a party to this Agreement.

26 25. Nothing in this Agreement is intended to limit the right of EPA to undertake
27 future response actions at the Site or to seek to compel parties other than the Settling
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1 Respondent to perform or pay for response actions at the Site. Nothing in this Agreement
2 shall in any way restrict or limit the nature or scope of response actions which may be taken or
3 be required by EPA in exercising its authority under federal law. Settling Respondent
4 acknowledges that it is purchasing Property where response actions may be required.
5

6 XII. SETTLING RESPONDENT'S COVENANT NOT TO SUE

7 26. In consideration of the United States' Covenant Not To Sue in Section X of this
8 Agreement, the Settling Respondent hereby covenants not to sue and not to assert any claims
9 or causes of action against the United States, its authorized officers, employees, or
10 representatives with respect to the Site or this Agreement, including but not limited to, any
11 direct or indirect claims for reimbursement from the Hazardous Substance Superfund
12 established pursuant to the Internal Revenue Code, 26 U.S.C. § 9507, through CERCLA
13 Sections 106(b)(2), 111, 112, 113, or any other provision of law, any claim against the United
14 States, including any department, agency, or instrumentality of the United States under
15 CERCLA Sections 107 or 113 related to the Site, or any claims arising out of response
16 activities at the Site, including claims based on EPA's oversight of such activities or approval
17 of plans for such activities.

18 27. The Settling Respondent reserves, and this Agreement is without prejudice to,
19 actions against the United States based on negligent actions taken directly by the United
20 States, not including oversight or approval of the Settling Respondent's plans or activities, that
21 are brought pursuant to any statute other than CERCLA or RCRA and for which the waiver of
22 sovereign immunity is found in a statute other than CERCLA or RCRA. Nothing herein shall
23 be deemed to constitute preauthorization of a claim within the meaning of Section 111 of
24 CERCLA, 42 U.S.C. § 9611, or 40 C.F.R. § 300.700(d).
25

26 XIII. PARTIES BOUND/TRANSFER OF COVENANT

27 28. This Agreement shall apply to and be binding upon the United States and shall
28

1 apply to and be binding upon the Settling Respondent, its parents, subsidiaries, officers,
2 directors, and employees. The United States' Covenant Not to Sue in Section X and
3 Contribution Protection in Section 7 shall apply to Settling Respondent's parents, subsidiaries,
4 officers, directors, or employees, to the extent that the alleged liability of the parent,
5 subsidiary, officer, director, or employee is based on its status and in its capacity as a parent,
6 subsidiary, officer, director, or employee of Settling Respondent, and not to the extent that the
7 alleged liability arose independently of the alleged liability of the Settling Respondent. Each
8 signatory of a Party to this Agreement represents that he or she is fully authorized to enter into
9 the terms and conditions of this Agreement and to legally bind such Party.

10 29. Notwithstanding any other provisions of this Agreement, all of the rights, benefits
11 and obligations conferred upon Settling Respondent under this Agreement may be assigned or
12 transferred to any person with the prior written consent of EPA in its sole discretion.

13 30. The Settling Respondent agrees to pay the reasonable costs incurred by EPA to
14 review any subsequent requests for consent to assign or transfer the benefits conferred by this
15 Agreement.

16 31. In the event of an assignment or transfer of the Property or an assignment or
17 transfer of an interest in the Property, the assignor or transferor shall continue to be bound by
18 all the terms and conditions, and subject to all the benefits, of this Agreement except as EPA
19 and the assignor or transferor agree otherwise and modify this Agreement, in writing,
20 accordingly. Moreover, prior to or simultaneous with any assignment or transfer of the
21 Property, the assignee or transferee must consent in writing to be bound by the terms of this
22 Agreement including but not limited to the certification requirement in Section IX of this
23 Agreement in order for the Covenant Not to Sue in Section X to be available to that party.
24 The Covenant Not To Sue in Section X shall not be effective with respect to any assignees or
25 transferees who fail to provide such written consent to EPA.

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XIV. DISCLAIMER

32. This Agreement in no way constitutes a finding by EPA as to the risks to human health and the environment which may be posed by contamination at the Property or the Site nor constitutes any representation by EPA that the Property or the Site is fit for any particular purpose.

XV. DOCUMENT RETENTION

33. The Settling Respondent agrees to retain and make available to EPA all business and operating records, contracts, Site studies and investigations, and documents in the possession or control of Settling Respondent, its officers, directors, employees, contractors, or agents relating to operations at the Property, for at least ten years, following the effective date of this Agreement unless otherwise agreed to in writing by the Parties. Documents relating to performance of work pursuant to Section V and the Statement of Work in Exhibit 3 shall be retained for ten years or until completion of work, whichever is longer. At the end of the retention period, the Settling Respondent shall notify EPA of the location of such documents and shall provide EPA with an opportunity to copy any documents at the expense of EPA.

XVI. PAYMENT OF COSTS

34. If the Settling Respondent fails to comply with the terms of this Agreement, including, but not limited to, the provisions of Section IV (Payment), Section V (Work to Be Performed), Section VI (Limitations on Use of Property), Section VII (Access/Notice to Successors in Interest), Section VIII (Due Care/Cooperation) of this Agreement, it shall be liable for all litigation and other enforcement costs incurred by the United States to enforce this Agreement or otherwise obtain compliance.

XVII. NOTICES AND SUBMISSIONS

35. Whenever, under the terms of this Agreement, written notice is required to be

1 given or other document is required to be sent by one Party to another, it shall be directed to
2 the individuals at the addresses specified below, unless those individuals or their successors
3 give notice of a change to the other Parties in writing. All notices and submissions shall be
4 considered effective upon receipt, unless otherwise provided.

5 As to the United States:

6 Loren McPhillips, Project Manager
7 EPA Region 10
8 1200 Sixth Ave, ECL-115
9 Seattle, WA 98101
10 206-553-4903

Jennifer Byrne, Asst. Regional Counsel
EPA Region 10
1200 Sixth Ave, ORC-158
Seattle, WA 98101
206-553-0050

9 Elaina Jackson
10 Pacific Wood Preserving of Oregon
11 5601 District Blvd.
12 Bakersfield, CA 93313
13 (661) 833-0429

Charles Blumenfeld
Perkins Coie LLP
1201 Third Avenue, Suite 4800
Seattle, WA 98101
(206) 264-6364

13 XVIII. EFFECTIVE DATE

14 36. The effective date of this Agreement shall be either the date upon which EPA
15 issues written notice to the Settling Respondent that EPA has fully executed the Agreement
16 after review of and, where necessary, response to any public comment received or the date
17 upon which EPA receives payment as provided for in Section IV, whichever is later.

19 XIX. TERMINATION

20 37. If any Party believes that any or all of the obligations under Section VII
21 (Access/Notice to Successors in Interest) are no longer necessary to ensure compliance with
22 the requirements of the Agreement, that Party may request in writing that the other Party agree
23 to terminate the provision(s) establishing such obligations; provided, however, that the
24 provision(s) in question shall continue in force unless and until the party requesting such
25 termination receives written agreement from the other party to terminate such provision(s).

1 XX. CONTRIBUTION PROTECTION

2 38. With regard to claims for contribution against Settling Respondent or any
3 successors or assigns, the Parties hereto agree that the Settling Respondent is entitled to
4 protection from contribution actions or claims as provided by CERCLA Section 113(f)(2),
5 42 U.S.C. § 9613(f)(2), for matters addressed in this Agreement. The matters addressed in
6 this Agreement are all response actions taken or to be taken and response costs incurred or to
7 be incurred by the United States or any other person for the Site with respect to the Existing
8 Contamination.

9 39. The Settling Respondent agrees that with respect to any suit or claim for
10 contribution brought by it for matters related to this Agreement it will notify the United States
11 in writing no later than 60 days prior to the initiation of such suit or claim.

12 40. The Settling Respondent also agrees that with respect to any suit or claim for
13 contribution brought against it for matters related to this Agreement it will notify in writing
14 the United States within 10 days of service of the complaint on Settling Respondent.

15
16 XXI. EXHIBITS

17 41. Exhibit 1 shall mean the description of the Property which is the subject of this
18 Agreement.

19 42. Exhibit 2 shall mean the map depicting the Site.

20 43. Exhibit 3 shall mean the Statement of Work.

21
22 XXII. REMOVAL OF LIEN

23 44. Subject to the Reservation of Rights in Section XI of this Agreement, upon
24 payment of the amount specified in Section IV (Payment), EPA agrees to remove any lien or
25 liens it may have on the Property under Section 107(l) of CERCLA, 42 U.S.C. § 9607(l), as a
26 result of response action conducted by EPA at the Property.

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XXIII. PUBLIC COMMENT

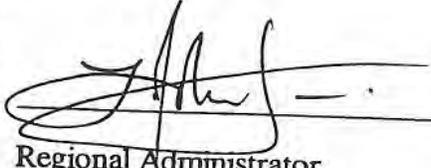
45. This Agreement shall be subject to a 14-day public comment period, after which EPA may modify or withdraw its consent to this Agreement if comments received disclose facts or considerations which indicate that this Agreement is inappropriate, improper, or inadequate.

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IT IS SO AGREED:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

BY:



Regional Administrator

1 February 2002

Date

Region 10

1 IT IS SO AGREED:
2 UNITED STATES DEPARTMENT OF JUSTICE

3 BY:

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Tom Sansonetti

2.4.02

Thomas L. Sansonetti
Assistant Attorney General
Environment and Natural Resources Division
United States Department of Justice

Date

1 IT IS SO AGREED:

2 BY:

3
4 Elaina Jackson

January 23, 2002

5 Name Elaina Jackson

Date

6 Pacific Wood Preserving of Oregon

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EXHIBIT 1
PROPERTY DESCRIPTION

Property located in Section 33, Township 5, Range 6, of the Willamette Meridian, County of Yamhill, State of Oregon.

PARCEL 1:

Tract 100
102
TRACT A: Tract No. 1, Subdivision of Lot No. 4 in the J. P. Wood Donation Land Claim in Section 33, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon, and more particularly described as follows:

BEGINNING at a point in the center of State Highway, 1.484 chains North and 7.181 chains North 71°26' West from the Southeast corner of the J. P. Wood Donation Land Claim, Notification No. 6708, Claim No. 44 in Section 33, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon; thence North 18.143 chains; thence South 89°18' West 1.122 chains; thence South 17.69 chains; thence South 71°26' East 1.181 chains to the point of beginning.

SAVE AND EXCEPTING THEREFROM that portion conveyed to the State of Oregon, by and through its Department of Transportation, Highway Division, by Deed recorded April 22, 1977 in Film Volume 119, Page 1255, Deed and Mortgage Records.

TRACT B: Beginning at the intersection of the center line of the State highway and the East line of the John P. Wood Donation Land Claim No. 44 in Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon, which point is North 12' West 1.484 chains from the Southeast corner of said Donation Land Claim; thence North 12' West along the East line of said Donation Land Claim 20.887 chains to the Southerly line of the Southern Pacific Company Right of Way; thence South 86°18' West along said Southerly line of said right of way 6.81 chains; thence South 18.143 chains to the center of said State Highway; thence South 71°26' East along the center of said State Highway to the point of beginning.

TRACT C: The following described tract lying in Section 33, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon:

BEGINNING at an iron rod, said rod being South 75° West 20.384 chains, North 00°16' East 26.337 chains, North 84°55' East 1.819 chains and North 86°19' East 8.793 chains and South 00°07' East 14.414 chains, North 82°21' West 1.250 chains from the Southeast corner of the J. P. Wood Donation Land Claim, Township 5 South, Range 6 West of the Willamette Meridian; thence North 14.177 chains to the center of the railroad; thence North 86°19' East 1.206 chains to a point; thence South 00°07' East 14.414 chains to an iron rod; thence North 82°21' West 1.250 chains to the point of beginning. EXCEPT the North 30 feet lying in railroad.

SAVE AND EXCEPTING THEREFROM that portion conveyed to the State of Oregon, by and through its Department of Transportation, Highway Division, by Deed recorded April 22, 1977 in Film Volume 119, Page 1255, Deed and Mortgage Records.

TRACT D: Beginning at an iron rod, said rod being South 75° West 20.384 chains; North 00°16' East 26.337 chains, North 84°55' East 1.819 chains, North 86°19' East 8.793 chains, South 00°07' East 14.414 chains and North 82°21' West 1.250 chains from the Southeast corner of the J. P. Wood Donation Land Claim, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon; thence North 14.177 chains to the center of the railroad; thence South 86°19' West 0.905 chains; thence South 13.998 chains to an iron rod on the West boundary of the Mackie property; thence South 82°21' East 0.909 chains to the point of beginning.

EXCEPTING THEREFROM the North 30 feet being in railroad, all of the above tract being located in Section 33, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon.

PROPERTY DESCRIPTION

SAVE AND EXCEPTING THEREFROM that portion conveyed to the State of Oregon, by and through its Department of Transportation, Highway Division, by Deed recorded April 22, 1977 in Film Volume 119, Page 1255, Deed and Mortgage Records.

Parcel 1

TRACT E: Beginning at an iron rod, said point being South 75° West 20.384 chains, North 00°16' East 26.337 chains, North 84°55' East 1.819 chains, North 86°19' East 8.793 chains, South 00°07' East 14.584 chains and South 12°07' East 0.926 chains from the Southeast corner of the J. P. Wood Donation Land Claim, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon; thence South 74°58' East 0.917 chains; thence North 15.798 chains to the center of the railroad; thence South 86°19' West along the center of the railroad 1.118 chains; thence South 00°07' East 14.584 chains to an iron rod; thence South 12°07' East 0.926 chains to the point of beginning.

EXCEPTING THEREFROM the North 30 feet being in the railroad.

SAVE AND EXCEPTING THEREFROM that portion conveyed to the State of Oregon, by and through its Department of Transportation, Highway Division, by Deed recorded April 22, 1977 in Film Volume 119, Page 1255, Deed and Mortgage Records.

Parcel 2
PARCEL 2: Beginning at a point in the center of the State Highway, 1.484 chains North and 10.81 chains North 71°26' West from the Southeast corner of the J. P. Wood Donation Land Claim, Notification No. 6708, Claim No. 44 in Section 33, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon; thence North 16.76 chains; thence South 86°18' West 90.9 links; thence South 16.39 chains; thence South 71°26' East 95.7 links to the point of beginning.

EXCEPTING THEREFROM that portion conveyed to Sheridan Pressure Treated Lumber, Inc., an Oregon corporation by Deed recorded October 16, 1969 in Film Volume 77, Page 828, Deed and Mortgage Records.

PARCEL 3: A tract of land in Section 33, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon, more particularly described as follows:

Commencing at the Southwest corner of a tract conveyed to Sheridan Pressure Treated Lumber, Inc., by Deed recorded October 13, 1969 in Film Volume 77, Page 744, Deed and Mortgage Records of Yamhill County, Oregon; thence South 82°21' East along the South line of said Sheridan Pressure tract 1.250 chains to the Southeast corner thereof; thence South 0°07' East 0.170 chains; thence South 12°07' East 0.926 chains to the Northwest corner of a tract conveyed to M. Estella Bunn, by Deed recorded May 17, 1971 in Film Volume 84, Page 96, Deed and Mortgage Records of Yamhill County, Oregon; thence South 15°02' West 1.747 chains to an iron rod on the North boundary of State Highway No. 18; thence North 71°26' West along the North boundary of said State Highway 1.034 chains; thence North 2.593 chains to the point of beginning.

PARCEL 4: The following described tract lying in Section 33, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon, more particularly described as follows:

Beginning at an iron rod, said point being South 75° West 20.384 chains, North 00°16' East 26.337 chains, North 84°55' East 1.819 chains, North 86°19' East 8.793 chains, South 00°07' East 14.584 chains and South 12°07' East 0.926 of a chain from the Southeast corner of the J. P. Wood Donation Land Claim, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon; thence South 15°02' West 1.747 chains to an iron rod at the North boundary of the highway; thence South 71°86' East 1.412 chains to the East boundary of the Bunn property; thence North 1.899 chains to an iron rod; thence North 74°58' West 0.917 of a chain to the point of beginning.

Newberg Surveying
1205 N. Evans
McMinnville, OR 97128
(503)-474-4742 • (503)-474-3752 Fax

April 19, 2002

Revised Legal description for Tax Lot 5633-500 Parcel 5

A tract of land being part of the John P. Wood Donation Land Claim No. 44 in Township 5 South, Range 6 West, Willamette Meridian, in Yamhill County, Oregon being more particularly described as follows:

Beginning at a point along the south margin of the Southern Pacific Railroad, said point being 30' distant from the existing railroad centerline and South 27° 46' 56" West 2054.03 feet from a brass cap in monument box (accepted as being the Northwest corner of Lot 12 of Ely Land, an unrecorded plat); thence along said margin North 86° 37' 21" East 210.53 feet to the Northeast corner of that tract of land described in deed dated July 31, 1971 and recorded in Film Volume 86, Page 984, Yamhill County Deed Records, and the TRUE POINT OF BEGINNING; thence South 0° 19' 50" West along the east boundary of said tract of land, 1054.15 feet more or less to the northerly margin of State Highway 18B; thence continuing along said highway margin, North 71° 07' 03" West 221.17 feet; thence North 71° 06' 34" West 371.03 feet to an iron pipe accepted as being along the west line of Lot 3 of the Ely Land unrecorded plat; thence continuing along said north margin of highway 249 feet more or less to a 5/8" iron rod, said iron rod bears N73°57'20"E 26.07 feet from a 1/2" iron pipe held for the Southeast corner of land described and recorded in Film Volume 149, Page 1182, Yamhill County Deed Records, (chord bearing North 82° 48' 13" West, 249.32 feet); thence leaving said highway, 25 feet from and parallel with the east boundary of land described and recorded in Film Volume 149, Page 1182, North 0° 24' 55" East 397.61 feet to an iron rod; thence North 70° 28' 09" West 271.91 feet to an iron rod; thence North 53° 38' 23" West 130.09 feet to an iron rod set on the southerly margin of the Southern Pacific Railroad, 30 feet from the existing railroad centerline; thence along said southerly margin 1214.61 feet more or less, (chord bearing North 77°19' 58" East 1201.12 feet) to the TRUE POINT OF BEGINNING, containing 18.2 acres more or less.

18.35 acres as County Plat

PACIFIC

3.42 CH

500 18.35 AC. C S 1 1 5 5 9 6 5 9 6 3 7

Handwritten note: 180' wide front access

P5

130.09
N53°38'23" W N70°28'09" W
271.91

N0°24'55" E 397.61

800 5 AC. EAST 310 SOUTH 380
CSP 4135
CSP 6313

WEST

THESE PARCEL #S

↓ TRACTS ARE FROM DOCUMENT #

200210682

6.81 CH

100 19.2 AC.

1.12CH 1.14CH 1.20CH .905CH .55CH

14.40 CH 13.99 CH .905CH

TRACT D-P1
TRACT C-P1
TRACT E-P1
TRACT A-P1
TRACT B-P1

400 0.3 AC. 300 0.134 AC. 200 0.26 AC.

P1 P2 P3 P4
1.90CH 1.25CH 1.95CH 1.92CH

1.71CH 1.64CH

172.9

200

INW

700 13.67 AC.

13.87 CH

1 AC.

2100

SE COR JAMES P WOODS 0.1 AC.

DLC 44

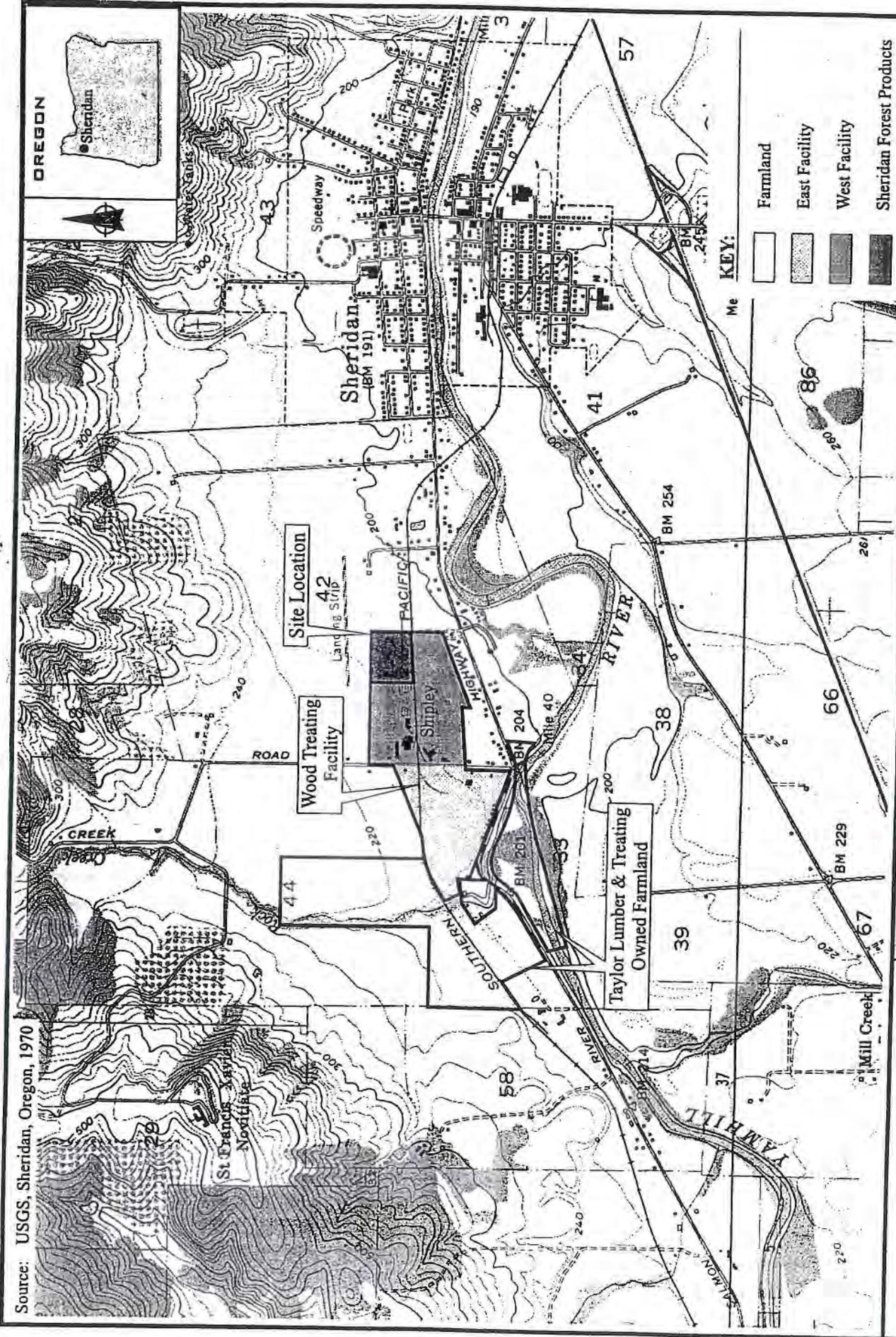
220 20.78 AC. 20.42 AC.

20.59 CH

575' W

20.88 CH 11.37 CH

BACK CREEK



Source: USGS, Sheridan, Oregon, 1970

OREGON



e **c** **o** **l** **o** **g** **y** **a** **n** **d** **e** **n** **v** **i** **r** **o** **n** **m** **e** **n** **t**, **i** **n** **c**.
 International Specialists in the Environment
 Seattle, Washington

TAYLOR LUMBER AND TREATING, INC.
 Sheridan, Oregon

SITE VICINITY MAP



Drawn:
AES

Date
5/19/00

Job No.
DC0601SIT0

Dwg.No.
DC0601 2-1

Prospective Purchaser Agreement
Pacific Wood Preserving of Oregon

EXHIBIT 3

**STATEMENT OF WORK
MAINTENANCE OF THE ASPHALT COVER,
SOIL STORAGE CELLS, AND GROUNDWATER EXTRACTION SYSTEM**

Taylor Lumber & Treating Site, Sheridan, Oregon

As part of this agreement, Pacific Wood Preserving of Oregon (PWPO) will perform the following maintenance tasks:

1. Asphalt Cover Inspection and Maintenance
2. Contaminated Soil Storage Cell Inspection and Maintenance
3. Groundwater Extraction System Operations and Maintenance

Pursuant to Section V of the Prospective Purchaser Agreement to which this Statement of Work is appended, PWPO shall commence the following maintenance activities on the effective date of the Prospective Purchaser Agreement.

A. Asphalt Cover Inspection and Maintenance

As part of the removal action at the Taylor Lumber & Treating Site, two areas were covered with asphalt. The areas covered with asphalt are shown in Figures 1 and 2. In order to ensure that the asphalt caps remain structurally sound and functioning as designed, PWPO personnel shall perform inspections of the asphalt cap at intervals not to exceed one week (seven calendar days). PWPO shall conduct the following inspection and maintenance activities:

1. Visually inspect the two asphalt covers to ensure that they are not significantly damaged in a way that compromises the performance of the cap. Ponding of water shall be minimized and cracks repaired as soon as possible after detection and no longer than seven days after detection.
2. Immediately clean up spills and contamination on the asphalt covers consistent with the appropriate RCRA-approved contingency plan (i.e. storage yard contingency plan).
3. Qualified personnel shall perform asphalt inspections and shall approve and oversee all required maintenance.

4. Lineal cracks in the asphalt cover shall be repaired within seven days of detection. Other repairs to the asphalt cover, not exceeding 225 square yards, shall be repaired as soon as feasible.
5. For repairs to the asphalt cover exceeding 225 square yards, PWPO shall prepare a plan that identifies specific procedures, to be used for the repair of the damaged asphalt cover. The plan shall also present a schedule for performance of the necessary repairs and shall identify mechanisms to prevent recurrence of the damage. After EPA approval of the plan, PWPO shall perform the necessary work pursuant to the approved plan.
6. A record of each inspection must be prepared and filed onsite. The inspection records shall be made available to EPA or EPA's authorized representatives upon request. The record shall include the following:
 - a. The time and date of each inspection.
 - b. The name of the person performing the inspection.
 - c. A brief description, including type and location, of any problems identified.
 - d. A brief description of required repairs.
 - e. The time and date that any required repairs were performed.
 - f. The name of the person(s) performing the required repairs.
 - g. The time and date of the inspection and final approval of required repairs.
 - h. The name of the person who inspected and approved the repairs.
7. In the event that the cover area is expanded or modified for remediation purposes, PWPO will perform inspection and maintenance on the expanded cover areas in accordance with this Statement of Work.
8. These activities shall be performed for as long as asphalt cover is necessary to address contamination at the Site.

B. Contaminated Soil Storage Cells Inspection and Maintenance Requirements

As part of the removal action at the Taylor Lumber & Treating Site, contaminated soil was excavated and stored in three cells located in the northwest corner of the Site, shown in Figure 1. In order to ensure that the cells remain structurally sound and the cell liner covers are intact and properly secured, PWPO personnel shall perform inspections of the contaminated soil storage cells ("cells") at intervals not to exceed one week (seven calendar days). PWPO shall conduct the following inspection and maintenance activities:

1. Visually inspect the berms of each cell for areas that exhibit seepage of moisture through or under the berms. If areas of seepage are found, PWPO shall repair the berms immediately.

2. Visually inspect the berms of each cell to ensure they are not being eroded by stormwater runoff. If areas of erosion are found, PWPO shall repair the eroding areas immediately.
3. Visually inspect the liner covering of each cell to ensure that it is properly secured. If the liner is not properly secured, PWPO shall secure it immediately. PWPO shall also replace damaged sand bags as necessary.
4. Visually inspect the liner covering of each cell to ensure that it is not damaged in any way. If the liner is damaged, PWPO must immediately replace or repair the liner covering in accordance with the manufacturer's requirements.
5. A record of each inspection must be prepared and filed onsite. The inspection records shall be made available to EPA or EPA's authorized representatives upon request. The record shall include the following:
 - a. The time and date of each inspection.
 - b. The name of the person performing the inspection.
 - c. A brief description, including type and location, of any problems identified.
 - d. A brief description of required repairs.
 - e. The time and date that any required repairs were performed.
 - f. The name of the person(s) performing required repairs.
 - g. The time and date of the inspection and final approval of required repairs.
 - h. The name of the person who inspected and approved the repairs.
6. These activities shall be performed for as long as contaminated soil is stored at the Site.

C. Groundwater Extraction System Operations and Maintenance Plan Requirements

In order to control the groundwater elevation within the boundaries of the barrier wall that was constructed by EPA as part of the removal action, EPA installed a groundwater extraction system. The groundwater extraction system is designed to keep the groundwater elevation at or below three feet below ground surface (bgs). Four extraction wells (PW-1, PW-2, PW-3, and PW-4) were installed to maintain the desired groundwater elevation. Because of site geology, the wells will sustain only a low flow rate. Therefore, low-flow, air-driven pneumatic pumps were installed in each well.

The effluent from wells PW-1 and PW-2 are pumped into a holding tank located next to the southwest corner of the boiler building. The effluent from well PW-3 is pumped into a sump pit located at the east end of the tank farm building. The effluent from well PW-4 is pumped into a sump pit located on the north side of the drip pad near the southwest corner of the creosote unloading building. Each pump's effluent is

eventually pumped into an existing evaporator system located at the treatment facility. Please refer to Figure 3 for the location of each well, associated air supply and effluent piping, and effluent discharge points. The pumps must be operated continuously.

PWPO shall operate and perform maintenance on the above described groundwater extraction system as follows:

1. Visually inspect each well vault and ensure that all piping is intact and is not leaking. If any piping is leaking, the pump shall be shut off and the piping repaired immediately.
2. Visually confirm that water is being pumped through the effluent lines. To check wells PW-1 and PW-2, PWPO shall attach a hose to the ball valve and pump the effluent into a container. Since wells PW-3 and PW-4 each discharge into a sump pit, verification can be achieved by witnessing the effluent discharge. If a pump is not functioning, PWPO shall identify the problem and repair the pump as soon as possible.
3. Record the air pressure setting for each pump. The air pressure should be set between 65 and 70 pounds per square inch.
4. Record the time required for three pump cycles and calculate the flow rate.
5. A record of each inspection must be prepared and filed onsite. The inspection records shall be made available to EPA or EPA's authorized representatives upon request. The record shall include the following:
 - a. The time and date of each inspection.
 - b. The name of the person performing the inspection.
 - c. The time required for each pump to go through three pumping cycles.
 - d. Calculations of the flow rate for each pump.
 - e. The air pressure at the well head of each pump.
 - f. A brief description of any leaks found in the air or water piping.
 - g. A brief description of repairs made to the air or water piping.
 - h. A brief description of problems with a pump.
 - i. A brief description of repairs made to a pump.
 - j. The time and date that any required repairs were performed.
 - k. The name of the person(s) performing required repairs.
 - l. The time and date of the inspection and final approval of required repairs.
 - m. The name of the person who inspected and approved the repairs.
6. In the event that the extraction system is expanded or modified for remediation purposes, PWPO will operate and perform maintenance on the new or modified extraction system.
7. These activities shall be performed until January 31, 2022, or until the

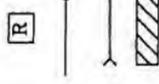
groundwater extraction system is no longer necessary to address contamination at the Site, whichever is sooner. If, after January 31, 2022, the groundwater extraction system is still necessary, EPA and PWPO shall negotiate in good faith an arrangement for the continued operation of the groundwater extraction system.

PWPO may choose not to run the effluent through the current evaporator system. PWPO may install a carbon treatment system to replace the current evaporator system. Such a system must comply with all applicable state and federal laws, including disposal of effluent and used carbon filters. If PWPO wishes to adopt some other means of disposing the effluent, PWPO shall present a plan for alternate disposal to EPA.

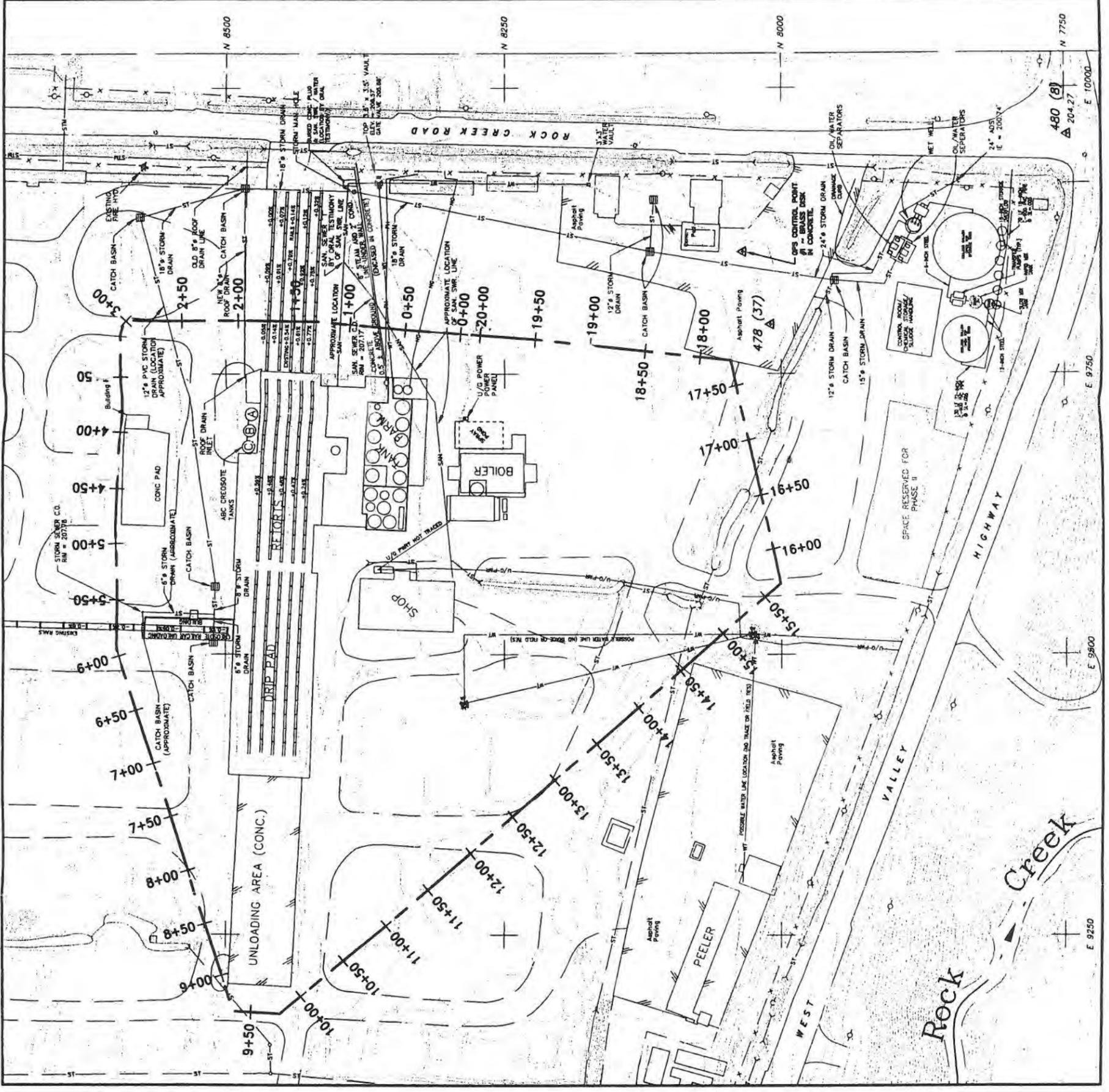


LEGEND

- TAYLOR LUMBER & TREATING FACILITY PROPERTY LINE
- RESIDENTIAL HOUSE
- STORM WATER FLOW DIRECTION
- CULVERT
- ASPHALT CAP



SITE MAP
 PHASE 1 REMEDIAL INVESTIGATION
 TAYLOR LUMBER AND TREATING SITE
 SHERIDAN, OREGON



LEGEND

- WT — WATER LINE (2" Ø STEEL)
- NG — NATURAL GAS LINE (2" Ø STEEL)
- O/H — OVERHEAD UTILITY
- PH — UNDERGROUND PHONE
- U/G PWR — UNDERGROUND POWER
- SAN — SANITARY SEWER
- ST — STORM SEWER
- STM — STEAM LINE
- — UTILITY POLE
- — RAIL
- x — SITE FENCE
- △ — SURVEY CONTROL POINT
- ⊗ — EXISTING WATER VALVE
- ⊗ — EXISTING HYDRANT
- — — — — EXISTING GROUND SURFACE ELEVATION CONTOUR
- — — — — GRAVEL ROAD
- 3+50 — SOIL-BENTONITE WALL CONSTRUCTION STATIONING

KEY

- CO = CLEAN-OUT
- CONC = CONCRETE



APPROXIMATE SCALE IN FEET
 0 100 200

BARRIER WALL LOCATION MAP

TAYLOR LUMBER AND TREATING SITE
 DATE: 11-28-00
 SCALE: AS SHOWN
 DRAWING NO: DI1901F3_7B.DWG
 FIGURE NO: 2

LEGEND

- PW-1 = GROUNDWATER EXTRACTION WELL
- GW — = GROUNDWATER EXTRACTION WELL DISCHARGE LINE (3/4" HDPE)
- AIR — = COMPRESSED AIR SUPPLY LINE (3/4" HDPE)
- WT — = WATER LINE (2" STEEL)
- NG — = NATURAL GAS LINE (2" STEEL)
- O/H — = OVERHEAD UTILITY
- PH — = UNDERGROUND PHONE
- U/G PWR — = UNDERGROUND POWER
- SAN — = SANITARY SEWER LINE
- ST — = STORM SEWER LINE
- STM — = STEAM LINE
- = DIRECTION OF FLOW
- = UTILITY POLE
- x — = RAIL
- x — = SITE FENCE
- △ = SURVEY CONTROL POINT
- ⊗ = EXISTING WATER VALVE
- ⊗ = EXISTING HYDRANT
- — — = EXISTING GROUND SURFACE ELEVATION CONTOUR
- — — = GRAVEL ROAD
- — — = SOIL-BENTONITE WALL CENTERLINE
- 3+50 = SOIL-BENTONITE WALL CONSTRUCTION STATIONING

KEY

- CO = CLEAN-OUT
- CONC = CONCRETE

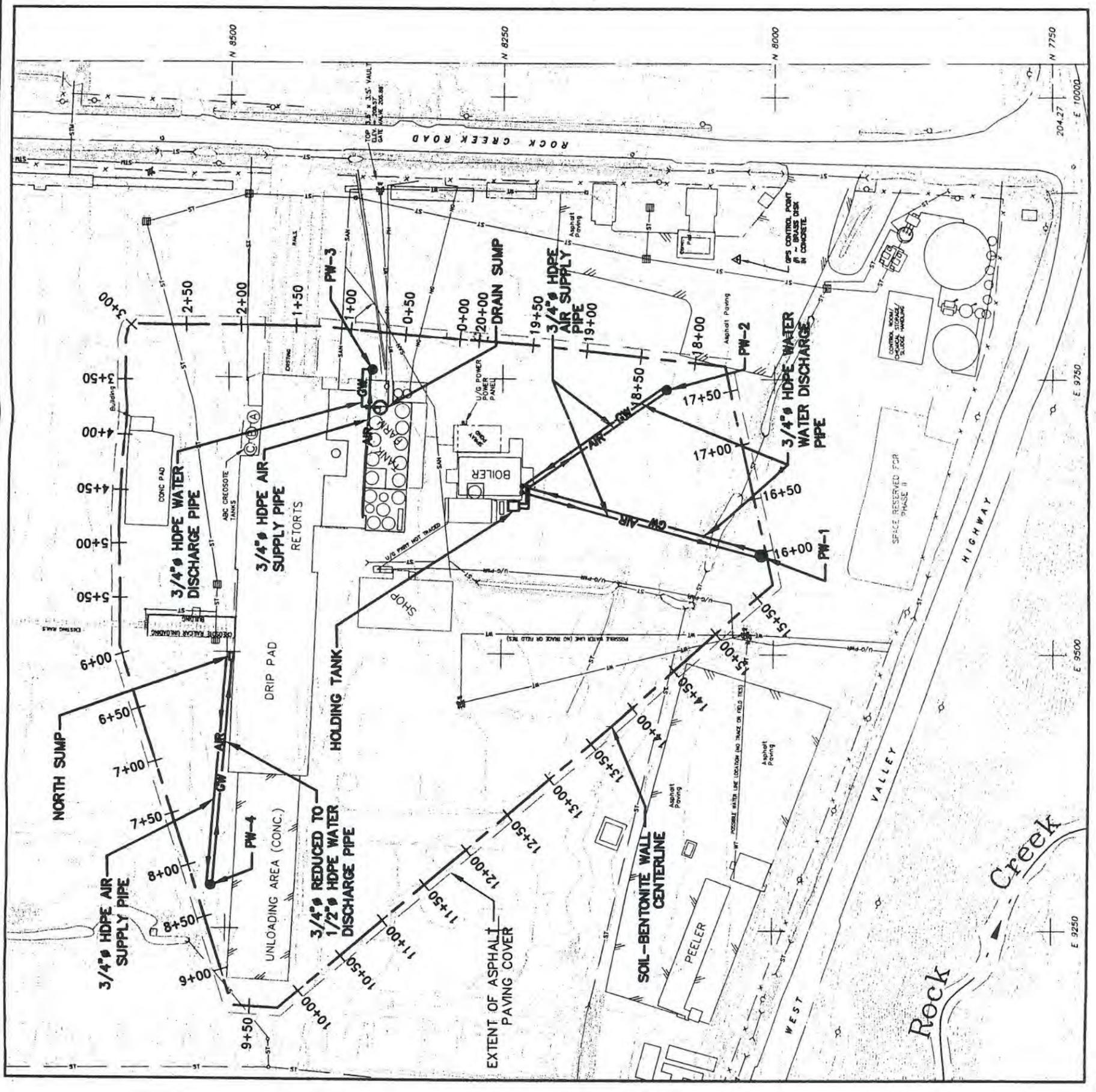


APPROXIMATE SCALE IN FEET
 0 100 200

GROUNDWATER EXTRACTION WELL AND PIPING LAYOUT

TAYLOR LUMBER AND TREATING SITE
 SCALE: NOTED
 DATE: 11-30-00
 FILE NO: DI1901F3_9B.DWG
 DRAWING NO:

PWPO Statement of Work Figure 3



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PACIFIC WOOD PRESERVING OF OREGON
 ASPHALT WEEKLY INSPECTION CHECKLIST

*Was in
 Laverie file*

A record of each inspection must be prepared and filed onsite. The inspection records shall be made available to EPA or EPA's authorized representatives upon request. The record shall include the following:

- a. The time and date of each inspection.
- b. The name of the person performing the inspection.
- c. A brief description, including type and location, of any problems identified.
- d. A brief description of required repairs.
- e. The time and date that any required repairs were performed - repairs must be made within 7 days of discovery of problem.
- f. The name of the person(s) performing the required repairs.
- g. The time and date of the inspection and final approval of required repairs.
- h. The name of the person who inspected and approved the repairs.

Inspection Criteria		Month/Year _____									
		Week 1		Week 2		Week 3		Week 4		Week 5	
		OK	EXC	OK	EXC	OK	EXC	OK	EXC	OK	EXC
ASPHALT	Damage										
	Surface Condition										
	Cracks										
	Settling										
INSPECTION	Date/Time:										
	Inspected By:										
PROBLEM	Date/Time problem discovered										
	Description, including type and location, of problem										
	Required Repair										
	Time/Date Repaired Person(s) Performing Repair										
	Time/Date inspection and approval of final repair Name of person inspecting and approving										
PROBLEM	Date/Time problem discovered										
	Description, including type and location, of problem										
	Required Repair										
	Time/Date Repaired Person(s) Performing Repair										
	Time/Date inspection and approval of final repair Name of person inspecting and approving										
PROBLEM	Date/Time problem discovered										
	Description, including type and location, of problem										
	Required Repair										
	Time/Date Repaired Person(s) Performing Repair										
	Time/Date inspection and approval of final repair Name of person inspecting and approving										

Note: Repairs exceeding 225 square yards require EPA approved plan.

PACIFIC WOOD PRESERVING OF OREGON
SOIL CELL WEEKLY INSPECTION CHECKLIST

A record of each inspection must be prepared and filed onsite. The inspection records shall be made available to EPA or EPA's authorized representatives upon request. The record shall include the following:

- a. The time and date of each inspection.
- b. The name of the person performing the inspection.
- c. A brief description, including type and location, of any problems identified.
- d. A brief description of required repairs.
- e. The time and date that any required repairs were performed.
- f. The name of the person(s) performing the required repairs.
- g. The time and date of the inspection and final approval of required repairs.
- h. The name of the person who inspected and approved the repairs.

Inspection Criteria		Month/Year _____									
		Week 1		Week 2		Week 3		Week 4		Week 5	
		OK	EXC	OK	EXC	OK	EXC	OK	EXC	OK	EXC
SOIL CELLS	Berms										
	Moisture leaching under - repair immediately										
	Moisture leaching through - repair immediately										
	Erosion from stormwater - repair immediately										
	Liner Cover										
	Properly Secured - repair immediately										
	Damaged - repair or replace immediately										
	Broken sand bags - replace as necessary										

INSPECTION	Date/Time:										
	Inspected By:										

PROBLEM	Date/Time problem discovered	
	Description, including type and location, of problem	
	Required Repair	
	Time/Date Repaired Person(s) Performing Repair	
	Time/Date inspection and approval of final repair Name of person inspecting and approving repairs	
PROBLEM	Date/Time problem discovered	
	Description, including type and location, of problem	
	Required Repair	
	Time/Date Repaired Person(s) Performing Repair	
	Time/Date inspection and approval of final repair Name of person inspecting and approving repairs	
PROBLEM	Date/Time problem discovered	
	Description, including type and location, of problem	
	Required Repair	
	Time/Date Repaired Person(s) Performing Repair	
	Time/Date inspection and approval of final repair Name of person inspecting and approving repairs	

PACIFIC WOOD PRESERVING OF OREGON
GROUNDWATER EXTRACTION SYSTEM WEEKLY INSPECTION CHECKLIST

A record of each inspection must be prepared and filed onsite. The inspection records shall be made available to EPA or EPA's authorized representatives upon request. The record shall include the following:

- a. The time and date of each inspection.
- b. The name of the person performing the inspection.
- c. The time required for each pump to go through three pumping cycles.
- d. Calculations of the flow rate for each pump.
- e. The air pressure at the well head of each pump.
- f. A brief description of any leaks found in the air or water piping.
- g. A brief description of any repairs made to the air or water piping.
- h. A brief description of problems with a pump.
- i. A brief description of repairs made to a pump.
- j. A brief description of required repairs.
- k. The time and date that any required repairs were performed.
- l. The name of the person(s) performing the required repairs.
- m. The time and date of the inspection and final approval of required repairs.
- n. The name of the person who inspected and approved the repairs.

Inspection Criteria For PW - 1		Month/Year _____										
		Week 1		Week 2		Week 3		Week 4		Week 5		
		OK	EXC	OK	EXC	OK	EXC	OK	EXC	OK	EXC	
GROUNDWATER EXTRACTION SYSTEM	Extraction Well Vault											
	Pump Functional - if not, repair pump a.s.a.p.											
	Pipes Leaking - repair leaks immediately											
	Verify operation of PW - 1 pump by attaching hose to ball valve and pumping effluent into a container.											
	Record Air Pressure	Week 1		Week 2		Week 3		Week 4		Week 5		
	PW-1											
	Air pressure should be set between 65 and 70 pounds per square inch.											
	Time Required For 3 Pump Cycles	Week 1		Week 2		Week 3		Week 4		Week 5		
	PW - 1											
	Calculated Flow Rate	Week 1		Week 2		Week 3		Week 4		Week 5		
PW-1												

Date/Time: _____
Inspected By: _____

PROBLEM	Date/Time problem discovered	
	Description, including type and location, of problem	
	Required Repair	
	Time/Date Repaired	
	Person(s) Performing Repair	
PROBLEM	Date/Time problem discovered	
	Description, including type and location, of problem	
	Required Repair	
	Time/Date Repaired	
	Person(s) Performing Repair	
PROBLEM	Date/Time problem discovered	
	Description, including type and location, of problem	
	Required Repair	
	Time/Date Repaired	
	Person(s) Performing Repair	

PACIFIC WOOD PRESERVING OF OREGON
GROUNDWATER EXTRACTION SYSTEM WEEKLY INSPECTION CHECKLIST

A record of each inspection must be prepared and filed onsite. The inspection records shall be made available to EPA or EPA's authorized representatives upon request. The record shall include the following:

- a. The time and date of each inspection.
- b. The name of the person performing the inspection.
- c. The time required for each pump to go through three pumping cycles.
- d. Calculations of the flow rate for each pump.
- e. The air pressure at the well head of each pump.
- f. A brief description of any leaks found in the air or water piping.
- g. A brief description of any repairs made to the air or water piping.
- h. A brief description of problems with a pump.
- i. A brief description of repairs made to a pump.
- j. A brief description of required repairs.
- k. The time and date that any required repairs were performed.
- l. The name of the person(s) performing the required repairs.
- m. The time and date of the inspection and final approval of required repairs.
- n. The name of the person who inspected and approved the repairs.

Inspection Criteria For PW - 2		Month/Year _____									
		Week 1		Week 2		Week 3		Week 4		Week 5	
		OK	EXC	OK	EXC	OK	EXC	OK	EXC	OK	EXC
GROUNDWATER EXTRACTION SYSTEM	Extraction Well Vault										
	Pump Functional - if not, repair pump a.s.a.p.										
	Pipes Leaking - repair leaks immediately										
	Verify operation of PW - 2 pump by attaching hose to ball valve and pumping effluent into a container.										
	Record Air Pressure	Week 1		Week 2		Week 3		Week 4		Week 5	
	PW- 2										
	Air pressure should be set between 65 and 70 pounds per square inch.										
	Time Required For 3 Pump Cycles	Week 1		Week 2		Week 3		Week 4		Week 5	
	PW - 2										
	Calculated Flow Rate	Week 1		Week 2		Week 3		Week 4		Week 5	
PW- 2											

Date/Time: _____
Inspected By: _____

PROBLEM	Date/Time problem discovered	
	Description, including type and location, of problem	
	Required Repair	
	Time/Date Repaired	
	Person(s) Performing Repair	
PROBLEM	Date/Time problem discovered	
	Description, including type and location, of problem	
	Required Repair	
	Time/Date Repaired	
	Person(s) Performing Repair	
PROBLEM	Date/Time problem discovered	
	Description, including type and location, of problem	
	Required Repair	
	Time/Date Repaired	
	Person(s) Performing Repair	

PROSPECTIVE PURCHASER AGREEMENT

DEQ No.02-03

BETWEEN: Oregon Department of Environmental Quality

AND: Pacific Wood Preserving of Oregon

EFFECTIVE DATE: 2-5-02 (Date of last signature below)

This Agreement is entered between the Oregon Department of Environmental Quality (DEQ) and Pacific Wood Preserving of Oregon (PWPO) pursuant to Oregon Revised Statutes (ORS) 465.260 and 465.327. This Agreement contains the following provisions:

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Attachment A

Attachment B

1. RECITALS

A. The subject property (Property) is located at 22125 S.W. Rock Creek Rd., Sheridan, Oregon. The Property is owned by Taylor Lumber & Treating, Inc. (Taylor). The legal description of the Property is set forth as Attachment A to this Agreement. Taylor filed a voluntary petition for relief pursuant to Chapter 11 of the U.S. Bankruptcy Code on June 11, 2001.

B. Taylor Lumber and Treating operated a wood processing and treating business on the Property from 1966 to 2001. A number of chemicals were used for the treatment of lumber, including creosote, pentachlorophenol (PCP) and arsenic.

C. The Property is about 300 feet north of the South Yamhill River. Rock Creek flows about 300 yards from the westernmost Property boundary.

D. Beginning with a groundwater assessment in 1988, Taylor has been the subject of over a dozen inspections, investigations, and cleanup actions related to stormwater discharges and releases of hazardous substances. In April 1995, an Administrative Order on Consent (U.S. Environmental Protection Agency Docket 10-94-0244-RCRA) was issued between Taylor Lumber and EPA. The Order outlined the conditions under which Taylor would conduct environmental investigations at the site.

Soil and water samples have been collected from test pits, soil borings, piezometers, groundwater monitoring wells, ditches, sediments, and surface water. Interim cleanup actions have been performed to preliminarily address contaminated areas at the site.

Contaminants have been detected in soil and groundwater samples collected from the Property. The contaminants detected in the site soils and/or groundwater include arsenic, creosote, polycyclic aromatic hydrocarbons, and PCP. Contaminants were also found in the sediments of Rock Creek and the South Yamhill River. These contaminants are "hazardous substances" within the meaning of ORS 465.200(15). The presence of hazardous substances at the Property constitutes a "release" of hazardous substances within the meaning of ORS 465.200(21), and makes the Property a "facility" within the meaning of ORS 465.200. Additional removal or remedial action is necessary at the Property to protect human health or the environment.

E. A number of corrective action activities have been performed at the site since 1990 to address onsite contamination caused by past operating practices and spills:

- A former concrete cooling water vault was cleaned, tested for leakage, and filled with a gravel/concrete mix (1990-1994).
- Contaminated soils were removed from the drip pad and retort area and disposed offsite (1991-1993).
- EPA responded to the release of 3,500 gallons of 5 percent enriched P-9 oil which flowed overland and collected in onsite drainage ditches (February 1999).
- EPA responded to the release of 27,500 gallons of reclaimed creosote and wastewater. Most was contained within a secondary containment structure but some migrated into the Rock Creek Road ditch (September 1999).
- EPA issued a Unilateral Administrative Order (UAO) for Removal Response Activities (EPA Docket CERCLA-10-2000-006) in November 1999. Taylor agreed to implement portions of the Work Plan attached to the UAO and EPA agreed to perform the remainder.
- A stormwater treatment system was installed by Taylor to control contaminant migration in onsite surface water runoff, and to meet the

requirements of the National Pollutant Discharge Elimination System (NPDES) permit (2000).

- Pursuant to the UAO referenced above, EPA installed a subsurface bentonite barrier wall onsite to contain the contaminated groundwater plume (2001).
- Pursuant to the UAO, EPA capped a portion of the former treated pole storage area to prevent exposure to arsenic-contaminated soil (2001).
- Pursuant to the UAO, EPA consolidated and placed contaminated soil from various onsite stockpiles and roadside ditches in soil storage cells located in the northwest area of the Treatment Plant (2001).

E. On June 14, 2001, the Property was added to EPA's National Priorities List. EPA has done significant removal work at the Property and is preparing a Remedial Investigation and Feasibility Study (RI/FS). Following the completion of the RI/FS, EPA will evaluate cleanup alternatives and choose a final remedy for the Property.

F. PWPO entered into an Asset Purchase Agreement with Taylor, dated December 13, 2001, to purchase certain assets from Taylor, including the Property. The United States Bankruptcy Court, District of Oregon approved the sale to PWPO by Order dated December 20, 2001.

G. On January 23, 2002, PWPO executed an Agreement And Covenant Not To Sue (Docket CERCLA-10-2002-0034) with EPA (EPA Agreement).

H. On January 30, 2002, PWPO applied to DEQ for entry into this Agreement, and agreed to reimburse DEQ's costs of technical review and agreement preparation.

I. PWPO is a Nevada corporation and a "person" within the meaning of ORS 465.200(20). According to information provided by PWPO, DEQ has determined that PWPO is not an owner or operator of the facility, and is not currently liable under ORS 465.255 for the release of hazardous substances existing at the facility as of the date of this Agreement.

J. PWPO intends to operate a wood preserving business on the Property using low environmental impact and low mammalian toxicity wood preservatives. PWPO's ability to use these preservatives provides the opportunity for redevelopment of the Property. The business activities will create about 40 jobs with a payroll approaching \$1,000,000 within the first two years of operation. In addition, PWPO's agreement to operate and maintain the groundwater extraction system will relieve EPA and DEQ of significant on-going costs.

K. PWPO agrees to perform the activities described in Section 2 of this Agreement at its expense. DEQ has determined that a "substantial public benefit" will result from this Agreement, within the meaning of ORS 465.327 (1)(d).

L. Based upon the information submitted by PWPO, DEQ has further determined that the proposed development activities at the Property will not contribute to or exacerbate existing contamination, increase health risks, or interfere with remedial measures necessary at the Property.

M. In determining to enter this Agreement, DEQ has consulted with the Yamhill County and has considered reasonably anticipated future land uses at the Property and surrounding properties.

N. PWPO recognizes that implementation of remedial measures at the Property in the future might interfere with PWPO's use of the Property. However, pursuant to the EPA Agreement, EPA has agreed to use reasonable efforts to minimize any interference with PWPO's operations in implementing its response action.

2. MEASURES TO BE UNDERTAKEN

A. EPA is the lead agency with regard to the remediation of the Property. Attachment B is the Statement of Work that is attached to the EPA Agreement. PWPO agrees to perform the measures described in Attachment B under EPA review and oversight DEQ will provide contemporaneous review with EPA of the remedial investigation and cleanup tasks at the Property. Except as provided in Section 2.C. of this Agreement, PWPO shall have no responsibility for payment of DEQ costs for oversight of the measures described in Attachment B.

B. Any development, construction, or other use of the Property shall be consistent with and shall not interfere with investigative or remedial activities necessary at the Property. To ensure such consistency and prevent exacerbation of existing contamination on the Property, PWPO will send copies to DEQ of any plans submitted to EPA regarding proposed physical changes or disturbances to the Property.

C. PWPO shall pay to DEQ Twenty Thousand Dollars (\$20,000.00) in full settlement of PWPO's responsibility for DEQ costs incurred prior to the effective date of this Agreement in connection with the Property. DEQ shall apply as a credit against this amount any balance remaining of PWPO's advance deposit.

PWPO shall pay this amount in monthly payments of One Thousand Dollars (\$1,000.00), commencing November 15, 2002, and continuing on the fifteenth day of each month until the amount has been paid in full. The payment shall be made by check payable to the "State of Oregon, Hazardous Substance Remedial Action Fund." PWPO shall pay simple interest of 9% per annum on late monthly installments, which interest shall begin to accrue the day after the monthly payment is due under this paragraph.

D. In accordance with existing State and Federal regulations, PWPO will notify occupants of the facility, site workers, demolition, construction, remediation, and landscape workers of the presence of soil contamination. Hazard notifications will be performed in accordance with applicable state and federal Occupational Safety and Health Administration (OSHA) regulations so that appropriate health and safety plans can be developed and implemented, if necessary.

E. Materials containing hazardous substances that are excavated from the Property or generated during building renovation/demolition are considered solid waste under Oregon Administrative Rules (OAR).

F. Excavated soil or debris that is disposed of off-site must be managed in accordance with OAR 340-093-040. In addition, each solid waste generated at the Property must be evaluated to determine if it is a hazardous waste under the Resource, Recovery and Conservation Act (RCRA) as defined in OAR 340-102-011 and Chapter 40 Code of Federal Regulations, Division 261 (40 CFR 261). Wastes that are determined to be hazardous must be appropriately managed and disposed of at a permitted facility.

Construction and demolition waste are not exempt from Oregon Solid Waste or Hazardous Waste Rules.

G. PWPO agrees that if EPA imposes any restrictions on the use of the Property that may be necessary to protect human health and the environment, PWPO will abide by such restrictions. If required by EPA, PWPO agrees that it will record such use restrictions in the office of the county clerk for Yamhill County.

3. GENERAL PROVISIONS

A. DEQ Oversight

DEQ will provide joint oversight with EPA of PWPO performance of the measures described in Attachment B. DEQ's costs for performing such oversight activities will be reimbursed by EPA pursuant to Support Agency Cooperative Agreement for multiple sites in OR # V-00718-05.

B. Access

(1) PWPO grants an irrevocable right of entry to DEQ and its authorized representatives to enter and move freely about the Property at all reasonable times for purposes of overseeing implementation of this Agreement, or conducting removal or remedial measures DEQ deems necessary. DEQ agrees to provide at least 72 hours oral notice prior to entering the Property, except in an emergency involving public health, safety, and welfare or the environment. Oral notification will be followed with written confirmation within five (5) business days.

(2) PWPO shall allow DEQ to inspect and copy all records in PWPO's possession or control relating to measures undertaken at the Property under this Agreement. PWPO shall preserve all such records for six (6) years after the effective date of this Agreement, and, after such six-year period, shall provide DEQ with sixty (60) days notice before destruction or other disposal of such records and make the records available for inspection and copying. (3) PWPO may assert a claim of confidentiality regarding any records submitted to or copied by DEQ pursuant to this Agreement. DEQ shall treat documents and records for which a claim of confidentiality has been made in accordance with ORS 192.410 to 192.505. If PWPO does not make a claim of confidentiality at the time the records are submitted to or copied by DEQ, the records may be made available to the public without notice to PWPO. DEQ reserves any rights to obtain documents withheld from DEQ as privileged.

C. Use Restrictions

PWPO agrees that in conducting its wood treating business, PWPO will not treat wood with solutions containing ACZA (ammoniacal copper zinc arsenate), CCA (Copper chromated arsenate), Pentachlorophenol, creosote, or any arsenical wood-preserving compounds.

D. Notice

All reports, notices, and other communications required under or relating to this Agreement shall be directed to:

For DEQ:

Marilyn Daniel

1102 Lincoln Street

Suite 210

Eugene, OR 97401

Tel: (541) 686-7838 ext. 239

For PWPO:

Elaina Jackson

5601 District Blvd.

Bakersfield, CA 93313

Tel: (661) 833-0429

E. DEQ Costs

PWPO will not be responsible for any costs incurred after the effective date of this Agreement by DEQ for which PWPO is not liable pursuant to Section 4B of this Agreement. DEQ costs may be recovered from EPA and other persons not a party to this Agreement.

F. Enforcement of Agreement and Reservation of Rights

(1) In the event of any failure of PWPO to comply with any obligation of this Agreement, DEQ may enforce this Agreement under ORS 465.260(5) or exercise any authority or pursue any claim or cause of action that DEQ might have. PWPO reserves any defenses or counterclaims it might have in the event of such action by DEQ.

(2) Except as provided in Subsections 3.F and 3.G of this Agreement, DEQ and PWPO reserve any claim or cause of action they respectively have as to any person or entity not a signatory to this Agreement.

(3) PWPO does not admit any liability or violation of law by virtue of entering this Agreement.

(4) DEQ reserves its authority to perform remedial measures regarding a release of hazardous substances at or from the Property.

G. Waivers

(1) PWPO waives any claim or cause of action it might have against the State of Oregon arising from contamination at the Property existing as of the date of acquisition of ownership or operation of the Property.

(2) PWPO waives any right it might have under ORS 465.260(7) to seek reimbursement from the Hazardous Substance Remedial Action Fund or the Orphan Site Account for cost incurred under this Agreement.

H. Hold Harmless and Indemnification

PWPO shall save and hold harmless the State of Oregon and its commissions, agencies, officers, employees, contractors, agents, and authorized representatives, and indemnify the foregoing, from and against any and all claims arising from acts or omissions related to this Agreement of PWPO or its officers, employees, contractors, agents, receivers, trustees, or assigns. DEQ shall not be considered a party to any contract made by PWPO or its agents in carrying out activities under this Agreement.

I. Public Notice

Upon execution of this Agreement, DEQ will provide public notice of this Agreement in a local newspaper of general circulation, describing the measures to be undertaken under this Agreement. Copies of the Agreement will be made available to the public. DEQ shall provide PWPO a draft of such notice and consider any comments

by PWPO on the draft notice, before publication. PWPO is responsible for the publication costs, if any, of such notice.

J. Recording

(1) Within thirty (30) days of the date PWPO receives an ownership interest in the Property, PWPO shall submit a copy or original of this Agreement (whichever is required by the county) to be recorded in the real property records of Yamhill County, State of Oregon. PWPO shall provide DEQ with written evidence of such recording within seven (7) days of recording.

(2) Before approval of any remedial action by EPA, DEQ will provide public notice and opportunity for comment on the proposed remedy in accordance with ORS 465.320.

K. Transfer of Interest

Until DEQ issues a No Further Action determination or Certification of Completion for the Property and PWPO completes all obligations required under this agreement, upon transfer of any interest in the Property, or a portion of the Property, from PWPO to another person or entity, PWPO shall provide written notice to the DEQ project manager within thirty (30) days of such transfer.

4. RELEASE FROM LIABILITY

A. Subject to the satisfactory performance by PWPO of its obligations under this Agreement, PWPO shall not be liable to the State of Oregon under ORS 465.200 through 465.455 and 465.900 for any release of the hazardous substances described in

Section 1 above at the Property existing as of the date PWPO's acquisition of its interest in or operation of the Property. PWPO shall bear the burden of proving that any hazardous substance release existed before the date of acquisition of its interest in or operation of the Property.

B. The release from liability under Subsection 4.A. of this Agreement shall not apply to any liability regarding:

- (1) A release of hazardous substances at the Property after the date of acquisition of an interest in or operation of the Property;
- (2) Contribution to or exacerbation of a release of hazardous substances;
- (3) Interference or failure to cooperate with DEQ, or with persons conducting remedial measures under DEQ's oversight at the Property
- (4) Failure to exercise due care or take reasonable precautions with respect to any hazardous substance at the Property;
- (5) Violation of federal, state, or local law regarding hazardous substances;
- (6) Any ownership, operation, or release of hazardous substances at the Property by PWPO before the effective date of this Agreement;
- (7) Any ownership, operation, or other ground of liability of PWPO for a release of hazardous substances at an off-site location affecting the Property; and
- (8) Any matters as to which the State of Oregon is owed indemnification under Subsection 3.G. of this Agreement.

5. PARTIES BOUND

A. This Agreement shall be binding on the signatories and their respective commissions, agencies, officers, directors, assigns, parents, subsidiaries, successors, employees, contractors, agents, and authorized representatives. The undersigned representative of each party certifies that he or she is fully authorized to execute and bind such party to this Agreement. No change in ownership or corporate or partnership status relating to the Property shall in any way alter PWPO's obligations under this Agreement, unless approved otherwise in writing by DEQ.

B. The benefits and burdens of this Agreement shall run with the land; however, the release from liability set forth in Subsection 4.A of this Agreement shall limit or otherwise affect the liability only of persons who are not potentially liable under ORS 465.255 for a release of hazardous substances at the Property as of the date of that person's acquisition of ownership or operation of the Property and who assume and are bound by the terms of this Agreement applicable to the Property as of the date of their acquisition of ownership or operation of the Property.

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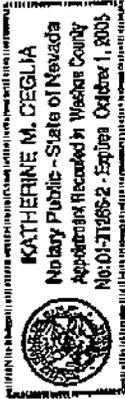
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6. SIGNATURES

Elaina Jackson

Date: 2-5-02

Elaina Jackson
Vice President
Pacific Wood Preserving of Oregon



SUBSCRIBED AND SWORN TO BEFORE ME this 5th day of February, 2002 by Elaina Jackson

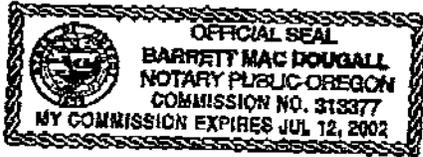
Dave Rozell
Dave Rozell, Acting Administrator
Land Quality Division
Oregon Department of Environmental Quality

Katherine M. Ceglia
NOTARY PUBLIC FOR Nevada
My Commission expires: October 1, 2005

Date: 2 Feb. 02

W. Donald SUBSCRIBED AND SWORN TO BEFORE ME this 2nd day of February, 2002 by Dave Rozell 2 Chunks
in his capacity as Acting Administrator of the Land Quality Division, Oregon Department of Environmental Quality.

Barrett MacDougall
NOTARY PUBLIC FOR OREGON
My Commission expires: 7-12-02



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ATTACHMENT A

Real Property and Improvements
(Fee Properties)

Property located in Section 33, Township 5, Range 6, of the Willamette Meridian,
County of Yamhill, State of Oregon.

Parcel 1: (Tax Lot R5633-100)

Tract A: Tract No. 1, Subdivision of Lot No. 4 in the J.P. Wood Donation Land Claim
in Section 33, Township 5 South, Range 6 West of the Willamette Meridian in
Yamhill County, Oregon, and more particularly described as follows:

BEGINNING at a point in the center of State Highway, 1.484
chains North and 7.181 chains North $71^{\circ}26'$ West from the
Southeast corner of the J.P. Wood Donation Land Claim,
Notification No. 6708, Claim No. 44 in Section 33, Township 5
South, Range 6 West of the Willamette Meridian in Yamhill
County, Oregon; thence North 18.143 chains; thence South $89^{\circ}18'$
West 1.122 chains; thence South 17.69 chains; thence South
 $71^{\circ}26'$ East 1.181 chains to the point of beginning.

SAVE AND EXCEPTING THEREFROM that portion conveyed
to the State of Oregon, by and through its Department of
Transportation, Highway Division, by Deed recorded April 22,
1977 in Film Volume 119, Page 1255, Deed and Mortgage
Records.

Tract B: Beginning at the intersection of the center line of the State
highway and the East line of the John P. Wood Donation Land
Claim No. 44 in Township 5 South, Range 6 West of the
Willamette Meridian in Yamhill County, Oregon, which point is
North $12'$ West 1.484 chains from the Southeast corner of said
Donation Land Claim; thence North $12'$ West along the East line
of said Donation Land Claim 20.887 chains to the Southerly line of
the Southern Pacific Company Right of Way; thence South $86^{\circ}18'$
West along said Southerly line of said right of way 6.81 chains;
thence South 18.143 chains to the center of said State Highway;
thence South $71^{\circ}26'$ East along the center of said State Highway to
the point of beginning.

Tract C: The following described tract lying in Section 33, Township 5 South, Range 6
West of the Willamette Meridian in Yamhill County, Oregon:

BEGINNING at an iron rod, said rod being South 75° West 20.384
chains, North $00^{\circ}16'$ East 26.337 chains, North $84^{\circ}55'$ East 1.819
chains and North $86^{\circ}19'$ East 8.793 chains and South $00^{\circ}07'$ East

14.414 chains, North 82°21' West 1.250 chains from the Southeast corner of the J.P. Wood Donation Land Claim, Township 5 South, Range 6 West of the Willamette Meridian; thence North 14.177 chains to the center of the railroad; thence North 86°19' East 1.206 chains to a point; thence South 00°07' East 14.414 chains to an iron rod; thence North 82°21' West 1.250 chains to the point of beginning. EXCEPT the North 30 feet lying in railroad.

SAVE AND EXCEPTING THEREFROM that portion conveyed to the State of Oregon, by and through its Department of Transportation, Highway Division, by Deed recorded April 22, 1977 in Film Volume 119, Page 1255, Deed and Mortgage Records.

Tract D:

Beginning at an iron rod, said rod being South 75° West 20.384 chains; North 00°16' East 26.337 chains, North 84°55' East 1.819 chains, North 86°19' East 8.793 chains, South 00°07' East 14.414 chains and North 82°21' West 1.250 chains from the Southeast corner of the J.P. Wood Donation Land Claim, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon; thence North 14.177 chains to the center of the railroad; thence South 86°19' West 0.905 chains; thence South 13.998 chains to an iron rod on the West boundary of the Mackie property; thence South 82°21' East 0.909 chains to the point of beginning.

EXCEPTING THEREFROM the North 30 feet being in railroad, all of the above tract being located in Section 33, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon.

SAVE AND EXCEPTING THEREFROM that portion conveyed to the State of Oregon, by and through its Department of Transportation, Highway Division, by Deed recorded April 22, 1977 in Film Volume 119, Page 1255; Deed and Mortgage Records.

Tract E:

Beginning at an iron rod, said point being South 75° West 20.384 chains, North 00°16' East 26.337 chains, North 84°55' East 1.819 chains, North 86°19' East 8.793 chains, South 00°07' East 14.584 chains and South 12°07' East 0.926 chains from the Southeast corner of the J.P. Wood Donation Land Claim, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon; thence South 74°58' East 0.917 chains; thence North 15.798 chains to the center of the railroad; thence South 86°19' West along the center of the railroad 1.118 chains; thence South 00°07' East 14.584 chains to an iron rod; thence South 12°07' East 0.926 chains to the point of beginning.

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EXCEPTING THEREFROM the North 30 feet being in the railroad.

SAVE AND EXCEPTING THEREFROM that portion conveyed to the State of Oregon, by and through its Department of Transportation, Highway Division, by Deed recorded April 22, 1977 in Film Volume 119, Page 1255. Deed and Mortgage Records.

Parcel 2: (Tax Lot R5633-400)

Beginning at a point in the center of the State Highway, 1.484 chains North and 10.81 chains North $71^{\circ}26'$ West from the Southeast corner of the J.F. Wood Donation Land Claim, Notification No. 6708, Claim No. 44 in Section 33, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon; thence North 16.76 chains; thence South $86^{\circ}18'$ West 90.9 links; thence South 16.39 chains; thence South $71^{\circ}26'$ East 95.7 links to the point of beginning.

EXCEPTING THEREFROM that portion conveyed to Sheridan Pressure Treated Lumber, Inc., an Oregon corporation by Deed recorded October 16, 1969 in Film Volume 77, Page 828. Deed and Mortgage Records.

Parcel 3: (Tax Lot R5633-300)

A tract of land in Section 33, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon, more particularly described as follows:

Commencing at the Southwest corner of a tract conveyed to Sheridan Pressure Treated Lumber, Inc., by Deed recorded October 13, 1969 in Film Volume 77, Page 744, Deed and Mortgage Records of Yamhill County, Oregon; thence South $82^{\circ}21'$ East along the South line of said Sheridan Pressure tract 1.250 chains to the Southeast corner thereof; thence South $0^{\circ}07'$ East 0.170 chains; thence South $12^{\circ}07'$ East 0.926 chains to the Northwest corner of a tract conveyed to M. Estella Bunn, by Deed recorded May 17, 1971 in Film Volume 84, Page 96, Deed and Mortgage Records of Yamhill County, Oregon; thence South $15^{\circ}02'$ West 1.747 chains to an iron rod on the North boundary of State Highway No. 18; thence North $71^{\circ}26'$ West along the North boundary of said State Highway 1.034 chains; thence North 2.593 chains to the point of beginning.

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Parcel 4: (Tax Lot R5633-200)

The following described tract lying in Section 33, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon, more particularly described as follows:

Beginning at an iron rod, said point being South 75° West 20.384 chains, North 00°16' East 26.337 chains, North 84°55' East 1.819 chains, North 86°19' East 8.793 chains, South 00°07' East 14.584 chains and South 12°07' East 0.926 of a chain from the Southeast corner of the J.P. Wood Donation Land Claim, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon; thence South 15°02' West 1.747 chains to an iron rod at the North boundary of the highway; thence South 71°26' East 1.412 chains to the East boundary of the Bunn property; thence North 1.899 chains to an iron rod; thence North 74°58' West 0.917 of a chain to the point of beginning.

Parcel 5: (Tax Lot R5633-500)

Being a part of the John P. Wood Donation Land Claim, Notification No. 6708, Claim No. 44 in Section 24, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon, and being the West 2.50 acres of Lot No. 4 of the tract known as the Elery land and beginning at the Southwest corner of said Lot No. 4, said point being in the center of the State Highway 1.484 chains North and North 71°26' West 13.405 chains from the Southeast corner of said Wood Claim; thence North along West line of said Lot 4, 15.781 chains to the Southerly margin of the Southern Pacific Railroad right of way; thence North 86°19' East along Southerly margin of said railroad right of way 1.557 chains; thence South 14.40 chains to the center of said State Highway and the South line of said Lot No. 4; thence North 71°26' West along South line of said Lot No. 4, 1.64 chains to the beginning.

ALSO: Beginning at the Southeast corner of Lot No. 3, Elery Land 1.48 chains North and 13.40 chains North 71°26' West from the Southeast corner of the John P. Wood Donation Land Claim, Notification No. 6708, Claim No. 44 in Section 33, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon; thence North 71°26' West 1.71 chains; thence North 15.15 chains to the South boundary of Southern Pacific right of way; thence North 86°19' East 1.63 chains to the Northeast corner of Lot No. 3, Elery Land; thence South 15.78 chains to the point of beginning.

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SAVE AND EXCEPTING THEREFROM that portion conveyed to the State of Oregon, by and through its Department of Transportation, Highway Division, by Deed recorded April 22, 1977 in Film Volume 119, Page 1255, Deed and Mortgage Records.

Parcel 6: (Tax Lot R5633-600)

A part of the John P. Wood Donation Land Claim No. 44 in Section 33, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon, more particularly described as follows:

Beginning at a point in the center of the State Highway No. 18, 1.68 chains North and North 71°26' West 14.12 chains from the Southeast corner of said Claim, said point of beginning, being the Southeast corner of land conveyed to William N. Beachy by Deed recorded July 12, 1944 in Book 125, Page 9, Deed Records; thence North 30 feet to an iron pipe on the Northerly line of the State Highway and the True Point of Beginning; thence North along the East line of said Beachy tract, 132 feet to the Northeast corner of a tract conveyed by William N. Beachy to Melvin J. Beachy, by Deed recorded July 9, 1951 in Book 162, Page 123, Deed Records; thence Westerly along the Northerly line of said Melvin J. Beachy tract, 174 feet; thence Southerly along the West line of said Melvin J. Beachy tract, 120 feet to the North line of said highway; thence South 71°26' East, 200 feet to the point of beginning.

That portion of tax lot 900 beginning at a point on the northwest corner of tax lot 500, thence south 837.9 feet to the northeast corner of tax lot 600, thence west 174 feet to the northwest corner of tax lot 600, thence south to the north line of State Highway 18, thence in a northwesterly direction to a point where the highway intersects the east line of tax lot 800, thence north 380 feet to the northeast corner of tax lot 800, thence west 318 feet to a point on the north line of tax lot 800, thence north to the south line of the Southern Pacific right of way, thence in a northeasterly direction along the south line of the Southern Pacific right of way to the point of beginning (to be determined pursuant to a lot line adjustment process with Yamhill County, Oregon).

The complete legal description for the entire tax lot R5633-900 is fully set out in Parcels 7 and 8 as described below:

Parcel 7: (Portion of Tax Lot R5633-900)

Part of the John P. Wood Donation Land Claim No. 44 in Section 33, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon, more particularly described as follows:

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Beginning at the Southwest corner of said Donation Land Claim; thence North 75° East along South line of said Claim, 36.81 chains, more or less, to the Southwest corner of the last described tract conveyed to Amy E. Eddy, by Deed recorded December 6, 1916 in Book 71, Page 350, Deed Records; thence North along Westerly line of the said Amy E. Eddy tract, 55.29 chains to the Northwest corner thereof, and also being the South line of tract conveyed to the Jesuit Novitiate of Sheridan, Oregon, by Deed recorded April 16, 1936 in Book 111, Page 257, Deed Records; thence West along the South line of said Novitiate tract, 18.83 chains, more or less, to angle corner of said Novitiate tract; thence South $1/2^{\circ}$ East along said Novitiate tract, 28.63 chains to the most Westerly Southeast corner of said Novitiate tract; thence West along the South line of said Novitiate tract 17.935 chains to the West line of said Donation Land Claim; thence South $1/2^{\circ}$ West along the West line of said Donation Land Claim 35.30 chains, more or less, to the point of beginning.

EXCEPTING THEREFROM the following five parcels:

- Tract A: That portion conveyed to Yamhill County, Oregon, by Deed recorded November 12, 1920 in Book 82, Page 376, Deed Records of Yamhill County, Oregon.
- Tract B: That portion described in Contract of Sale between W.O. Wildman et ux. and Robert O. Bowman et ux. recorded April 10, 1968 in Film Volume 67, Page 214, Deed and Mortgage Records.
- Tract C: That portion conveyed to Willis F. Spangler et ux., by Deed recorded December 27, 1972 in Film Volume 92, Page 1019, Deed and Mortgage Records.
- Tract D: From a point at the intersection of North right of way line of the Willamina, Sheridan Highway and the West line of the John P. Wood Donation Land Claim No. 44, such point being 7920.00 feet, more or less, South latitude from the Northwest corner of said Claim, proceed along the North right of way line of said Highway, North $60^{\circ}45'$ East, 136.9 feet; thence North $59^{\circ}37'$ East 363.1 feet; thence continuing along said North right of way line, 560.00 feet to the most Easterly corner of that certain Contract recorded April 12, 1972 in Film Volume 88, Page 2115, Deed and Mortgage Records; thence North $30^{\circ}32'$ West along Northeasterly line of above contract, 736.50 feet to an iron pipe on Southerly boundary of the Southern Pacific Railroad right of way; thence Southwesterly along said Southerly boundary of said Southern Pacific Railroad right of way to the West line of the John P. Wood Donation Land Claim No. 44; thence South along said West line of Donation Land Claim, 794.00 feet, more or less, to the point of beginning.

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Tract E: That portion conveyed to the State of Oregon, by and through its Department of Transportation, Highway Division, by Deed recorded April 22, 1977 in Film Volume 119, Page 1258, Deed and Mortgage Records.

Parcel 8: (Portion of Tax Lot R5633-900)

Beginning at a point in the center of State Highway No. 18, 1.48 chains North and 19.77 chains North 71°26' West of the Southeast corner of the John P. Wood Donation Land Claim No. 44 in Section 33, Township 5 South, Range 6 West of the Willamette Meridian in Yamhill County, Oregon; thence North 00°16' East 12.964 chains; thence North 84°55' East 1.891 chains; thence North 86°18' East 3.42 chains; thence South 837.9 feet to the Northeast corner of tract conveyed to Melvin J. Beachy by Deed recorded July 9, 1951 in Book 162, Page 123, Deed Records of Yamhill County, Oregon; thence West along the North line of said Beachy tract, 174.00 feet; thence South along the West line of said Beachy tract, 150.00 feet, more or less, to the center of said State Highway, thence North 71°26' West along the center of said State Highway 172.90 feet, more or less, to the point of beginning.

SAVE AND EXCEPTING THEREFROM that portion conveyed to the State of Oregon, by and through its Department of Transportation, Highway Division, by Deed recorded April 22, 1977 in Film Volume 119, Page 1258, Deed and Mortgage Records.

**Prospective Purchaser Agreement
Pacific Wood Preserving of Oregon**

ATTACHMENT B

**STATEMENT OF WORK
MAINTENANCE OF THE ASPHALT COVER,
SOIL STORAGE CELLS, AND GROUNDWATER EXTRACTION SYSTEM**

Taylor Lumber & Treating Site, Sheridan, Oregon

As part of this agreement, Pacific Wood Preserving of Oregon (PWPO) will perform the following maintenance tasks:

1. Asphalt Cover Inspection and Maintenance
2. Contaminated Soil Storage Cell Inspection and Maintenance
3. Groundwater Extraction System Operations and Maintenance

Pursuant to Section V of the Prospective Purchaser Agreement to which this Statement of Work is appended, PWPO shall commence the following maintenance activities on the effective date of the Prospective Purchaser Agreement.

A. Asphalt Cover Inspection and Maintenance

As part of the removal action at the Taylor Lumber & Treating Site, two areas were covered with asphalt. The areas covered with asphalt are shown in Figures 1 and 2. In order to ensure that the asphalt caps remain structurally sound and functioning as designed, PWPO personnel shall perform inspections of the asphalt cap at intervals not to exceed one week (seven calendar days). PWPO shall conduct the following inspection and maintenance activities:

1. Visually inspect the two asphalt covers to ensure that they are not significantly damaged in a way that compromises the performance of the cap. Ponding of water shall be minimized and cracks repaired as soon as possible after detection and no longer than seven days after detection.
2. Immediately clean up spills and contamination on the asphalt covers consistent with the appropriate RCRA-approved contingency plan (i.e. storage yard contingency plan).
3. Qualified personnel shall perform asphalt inspections and shall approve and oversee all required maintenance.

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4. Lineal cracks in the asphalt cover shall be repaired within seven days of detection. Other repairs to the asphalt cover, not exceeding 225 square yards, shall be repaired as soon as feasible.
5. For repairs to the asphalt cover exceeding 225 square yards, PWPO shall prepare a plan that identifies specific procedures, to be used for the repair of the damaged asphalt cover. The plan shall also present a schedule for performance of the necessary repairs and shall identify mechanisms to prevent recurrence of the damage. After EPA approval of the plan, PWPO shall perform the necessary work pursuant to the approved plan.
6. A record of each inspection must be prepared and filed onsite. The inspection records shall be made available to EPA or EPA's authorized representatives upon request. The record shall include the following:
 - a. The time and date of each inspection.
 - b. The name of the person performing the inspection.
 - c. A brief description, including type and location, of any problems identified.
 - d. A brief description of required repairs.
 - e. The time and date that any required repairs were performed.
 - f. The name of the person(s) performing the required repairs.
 - g. The time and date of the inspection and final approval of required repairs.
 - h. The name of the person who inspected and approved the repairs.
7. In the event that the cover area is expanded or modified for remediation purposes, PWPO will perform inspection and maintenance on the expanded cover areas in accordance with this Statement of Work.
8. These activities shall be performed for as long as asphalt cover is necessary to address contamination at the Site.

B. Contaminated Soil Storage Cells Inspection and Maintenance Requirements

As part of the removal action at the Taylor Lumber & Treating Site, contaminated soil was excavated and stored in three cells located in the northwest corner of the Site, shown in Figure 1. In order to ensure that the cells remain structurally sound and the cell liner covers are intact and properly secured, PWPO personnel shall perform inspections of the contaminated soil storage cells ("cells") at intervals not to exceed one week (seven calendar days). PWPO shall conduct the following inspection and maintenance activities:

1. Visually inspect the berms of each cell for areas that exhibit seepage of moisture through or under the berms. If areas of seepage are found, PWPO shall repair the berms immediately.

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2. Visually inspect the berms of each cell to ensure they are not being eroded by stormwater runoff. If areas of erosion are found, PWPO shall repair the eroding areas immediately.
3. Visually inspect the liner covering of each cell to ensure that it is properly secured. If the liner is not properly secured, PWPO shall secure it immediately. PWPO shall also replace damaged sand bags as necessary.
4. Visually inspect the liner covering of each cell to ensure that it is not damaged in any way. If the liner is damaged, PWPO must immediately replace or repair the liner covering in accordance with the manufacturer's requirements.
5. A record of each inspection must be prepared and filed onsite. The inspection records shall be made available to EPA or EPA's authorized representatives upon request. The record shall include the following:
 - a. The time and date of each inspection.
 - b. The name of the person performing the inspection.
 - c. A brief description, including type and location, of any problems identified.
 - d. A brief description of required repairs.
 - e. The time and date that any required repairs were performed.
 - f. The name of the person(s) performing required repairs.
 - g. The time and date of the inspection and final approval of required repairs.
 - h. The name of the person who inspected and approved the repairs.
6. These activities shall be performed for as long as contaminated soil is stored at the Site.

C. Groundwater Extraction System Operations and Maintenance Plan Requirements

In order to control the groundwater elevation within the boundaries of the barrier wall that was constructed by EPA as part of the removal action, EPA installed a groundwater extraction system. The groundwater extraction system is designed to keep the groundwater elevation at or below three feet below ground surface (bgs). Four extraction wells (PW-1, PW-2, PW-3, and PW-4) were installed to maintain the desired groundwater elevation. Because of site geology, the wells will sustain only a low flow rate. Therefore, low-flow, air-driven pneumatic pumps were installed in each well.

The effluent from wells PW-1 and PW-2 are pumped into a holding tank located next to the southwest corner of the boiler building. The effluent from well PW-3 is pumped into a sump pit located at the east end of the tank farm building. The effluent from well PW-4 is pumped into a sump pit located on the north side of the drip pad near the southwest corner of the creosote unloading building. Each pump's effluent is

eventually pumped into an existing evaporator system located at the treatment facility. Please refer to Figure 3 for the location of each well, associated air supply and effluent piping, and effluent discharge points. The pumps must be operated continuously.

PWPO shall operate and perform maintenance on the above described groundwater extraction system as follows:

1. Visually inspect each well vault and ensure that all piping is intact and is not leaking. If any piping is leaking, the pump shall be shut off and the piping repaired immediately.
2. Visually confirm that water is being pumped through the effluent lines. To check wells PW-1 and PW-2, PWPO shall attach a hose to the ball valve and pump the effluent into a container. Since wells PW-3 and PW-4 each discharge into a sump pit, verification can be achieved by witnessing the effluent discharge. If a pump is not functioning, PWPO shall identify the problem and repair the pump as soon as possible.
3. Record the air pressure setting for each pump. The air pressure should be set between 65 and 70 pounds per square inch.
4. Record the time required for three pump cycles and calculate the flow rate.
5. A record of each inspection must be prepared and filed onsite. The inspection records shall be made available to EPA or EPA's authorized representatives upon request. The record shall include the following:
 - a. The time and date of each inspection.
 - b. The name of the person performing the inspection.
 - c. The time required for each pump to go through three pumping cycles.
 - d. Calculations of the flow rate for each pump.
 - e. The air pressure at the well head of each pump.
 - f. A brief description of any leaks found in the air or water piping.
 - g. A brief description of repairs made to the air or water piping.
 - h. A brief description of problems with a pump.
 - i. A brief description of repairs made to a pump.
 - j. The time and date that any required repairs were performed.
 - k. The name of the person(s) performing required repairs.
 - l. The time and date of the inspection and final approval of required repairs.
 - m. The name of the person who inspected and approved the repairs.
6. In the event that the extraction system is expanded or modified for remediation purposes, PWPO will operate and perform maintenance on the new or modified extraction system.
7. These activities shall be performed until January 31, 2022, or until the

groundwater extraction system is no longer necessary to address contamination at the Site, whichever is sooner. If, after January 31, 2022, the groundwater extraction system is still necessary, EPA and PWPO shall negotiate in good faith an arrangement for the continued operation of the groundwater extraction system.

PWPO may choose not to run the effluent through the current evaporator system. PWPO may install a carbon treatment system to replace the current evaporator system. Such a system must comply with all applicable state and federal laws, including disposal of effluent and used carbon filters. If PWPO wishes to adopt some other means of disposing the effluent, PWPO shall present a plan for alternate disposal to EPA.

RECEIVED
DEC 2 2002

Perkins
Coie
LLP

Charles R. Blumenfeld
PHONE: 206.264.6364
FAX: 206.583.8500
EMAIL: cblumenfeld@perkinscoie.com

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www.perkinscoie.com

November 27, 2002

Mr. Loren McPhillips
Project Manager
EPA Region 10
1200 Sixth Avenue ECL-115
Seattle, WA 98101

Jennifer Byrne, Esq.
Assistant Regional Counsel
EPA Region 10
1200 Sixth Avenue ORC-158
Seattle, WA 98101

Re: Pacific Wood Preserving of Oregon (Docket CERCLA 10-2002-0034)

Dear Loren and Jennifer:

Pursuant to Paragraph 17 of the Agreement And Covenant Not To Sue ("Agreement") we are submitting the first page of the state PPA that we filed with the Yamhill County Recorder on June 18, 2002. The first page shows evidence of filing. Since we filed the full agreement, which includes Attachment B (which is identical to Exhibit 3 to the Agreement), we did not submit it for EPA review before filing.

Please let me know if you have any questions

Very truly yours,


Charles R. Blumenfeld

CB:cb

cc: Roland Mueller
Elaina Jackson

[LETTER.01]

PROSPECTIVE PURCHASER AGREEMENT

DEQ No.02-03

BETWEEN: Oregon Department of Environmental Quality

AND: Pacific Wood Preserving of Oregon

EFFECTIVE DATE: 2-5-02 (Date of last signature below)

This Agreement is entered between the Oregon Department of Environmental Quality (DEQ) and Pacific Wood Preserving of Oregon (PWPO) pursuant to Oregon Revised Statutes (ORS) 465.260 and 465.327. This Agreement contains the following provisions:

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Attachment A

Attachment B

OFFICIAL YAMHILL COUNTY RECORDS
CHARLES STERN, COUNTY CLERK



\$281.00

00092384200200118810520522

200211881

10:23:36 AM 6/18/2002

DMR-AGRODMR Cnt=1 Str=3 SUSAN
\$260.00 \$10.00 \$11.00

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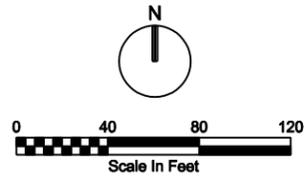
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B Asphalt Cap As-Built Drawings

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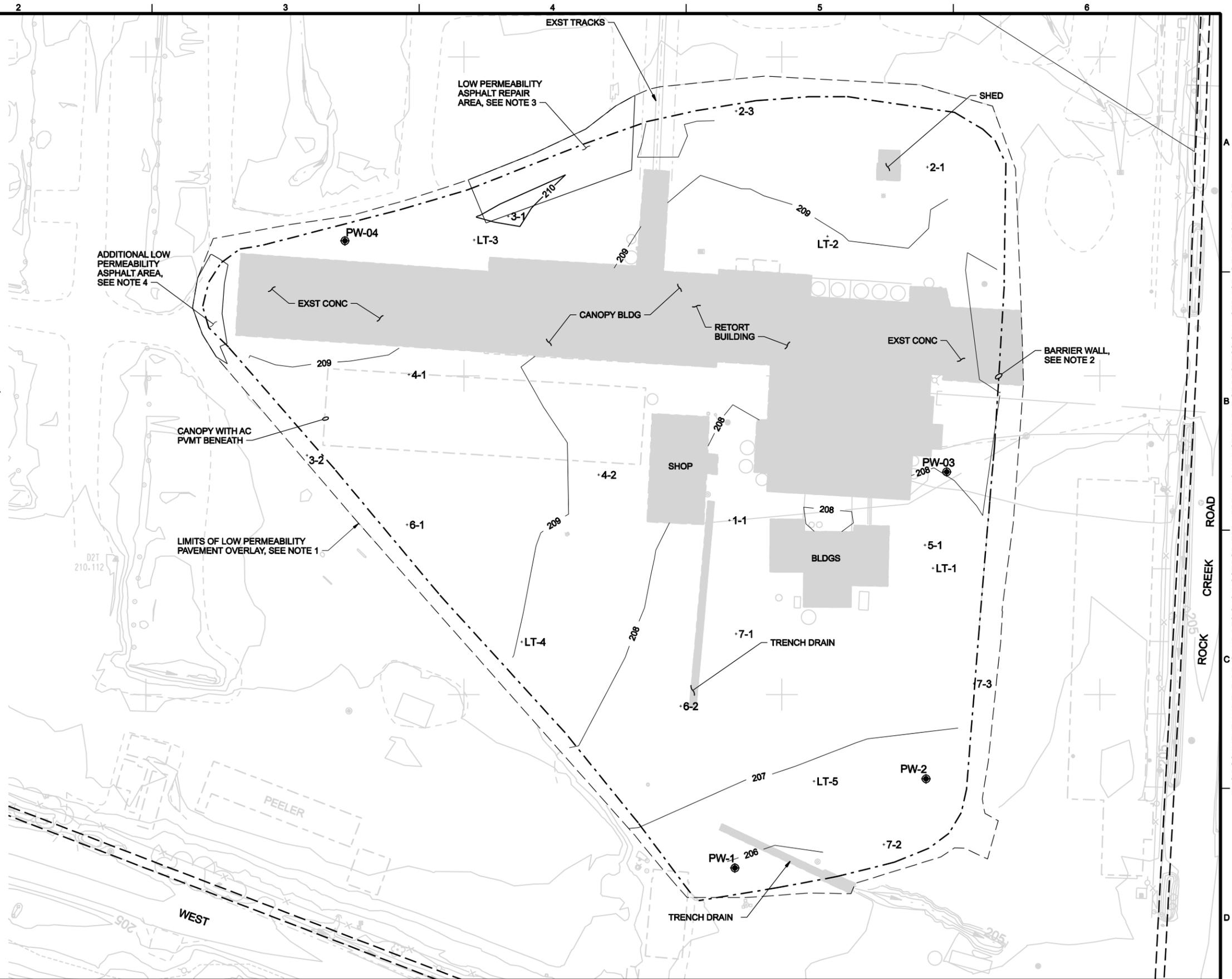
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- LEGEND:**
- CB CATCH BASIN
 - EXTRACTION WELL
 - 6-1 AC CORE LOCATIONS
 - LOW PERMEABILITY ASPHALT LIMITS
 - - - BARRIER WALL CENTER LINE
 - LOW PERMEABILITY PAVEMENT PLACED TO EDGE OF EXSTING AND NEW STRUCTURES (SHADED AREAS)

- NOTES:**
1. A 4" LOW PERMEABILITY ASPHALT OVERLAY WAS INSTALLED ON ENTIRE PAVED SURFACE TO LIMITS SHOWN. A MINIMUM 4" THICKNESS WAS MAINTAINED AT ALL EDGES AND TRANSITIONS. ASPHALT VARIED IN THICKNESS FROM 3.2 TO 5.1 INCHES BASED ON ASPHALT CORES.
 2. A 4" WIDE WHITE PAVEMENT STRIPE WAS PAINTED ON FINISHED SURFACE OF PAVEMENT OVERLAY TO DELINEATE LOCATION OF BARRIER WALL CENTERLINE.
 3. AN AREA OF LOW PERMEABILITY ASPHALT DID NOT MEET SPECIFIED SMOOTHNESS TOLERANCES FOR JOINTS. THIS AREA WAS ROUGHENED WITH A GRINDER AND OVERLAIN WITH A THIN LAYER OF ADDITIONAL LOW PERMEABILITY ASPHALT TO PROVIDE A SMOOTHER OPERATING SURFACE.
 4. A 1,455 SF AREA OF LOW PERMEABILITY ASPHALT WAS ADDED AFTER COMPLETION OF PAVING OPERATIONS. THIS AREA WAS ADDED BECAUSE THE ORIGINAL PAVING LIMITS DID NOT EXTEND OUTSIDE OF THE BARRIER WALL CENTERLINE TO THE LIMITS SHOWN IN THE DESIGN DRAWINGS.



DSGN	JA BOOTH								
DR	PA LONG								
CHK	JR TRACY	NO	DATE	DESCRIPTION	APVR	N			
APVD	TW DYE	NO.	DATE	REVISION	BY	APVD			

VERIFY SCALE
 BAR IS ONE INCH ON ORIGINAL DRAWING.
 0 1"
 IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

CH2MHILL

SEPA
 REGION 10 SEATTLE, WASHINGTON
 TAYLOR LUMBER
 SHERIDAN, OREGON

CIVIL
**LOW PERMEABILITY ASPHALT
 CAP AS-BUILT PLAN**

SHEET	12
DWG	C-12
DATE	DECEMBER 2008
PROJ	342790

THIS DOCUMENT, AND THE IDEAS AND DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF PROFESSIONAL SERVICE, IS THE PROPERTY OF CH2M HILL. REUSE OF DOCUMENTS: CH2M HILL AND IS NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF CH2M HILL.

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C Warranty for Asphalt Repair

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6-10-8
122

BAKER ROCK RESOURCES
WARRANTY AGREEMENT
FOR
PAVEMENT REPAIR
TO
U.S. ENVIRONMENTAL PROTECTION AGENCY
EPA PRIME CONTRACT EP-R7-07-08
TAYLOR LUMBER & TREATING, SHERIDAN, OREGON

This Warranty (hereinafter, the Warranty) applies to future defects resulting from Baker Rock Resources' failure to meet the requisite standards of performance for work accomplished on June 22, 2007 at the Taylor Lumber and Treating Superfund Site in Sheridan, Oregon (the Site), pursuant to United States Environmental Protection Agency (EPA) Prime Contract EP-R7-07-08. Specifically, Baker Rock Resources' performance in Areas 1, 3, 4 and 5 of the Site, referenced in Exhibit 1 entitled "As-built Drawings of the Taylor Lumber and Treating Superfund Site," attached and incorporated herein, failed to meet the requisite ninety-five percent (95%) relative compaction for aggregate base as determined in accordance with ASTM D1557.

The warranty is valid for a period of five years from July 1, 2007.

This warranty is only for the original Purchaser, the U.S. Environmental Protection Agency, and is not transferable or assignable without express written request from Purchaser and written approval from Baker Rock Resources. Written requests for transfer will not be unreasonably withheld.

Baker Rock Resources warrants that all services performed hereunder shall be performed in a manner consistent with that degree and care and skill ordinarily exercised by members of the same profession currently practicing under similar standards in the region where the work is being performed.

Furthermore, Baker Rock Resources, Inc. warrants that (i) all articles furnished hereunder shall be free from material defects in workmanship and (ii) Baker Rock Resources' nonconforming work in Areas 1, 3, 4 and 5 of the Site (Reference attached Exhibit 1) will not result in, or cause the failure of, the MatCon overly. Failure of the subject MatCon overly shall be evidenced by rutting or cracking due to subgrade failure as defined for surface tolerances of the MatCon overlay in EPA Contract EP-R7-07-08 Specification Â§ 02772 Â¶3.05.E.4 requiring a maximum deviation in finished grade of 6 millimeters.

Claims for defects, deficiencies, errors or omissions or any other claims of Purchaser must be made in writing no later than five years from the first day of the month following completion of the installation of the patch/repair work.

In the event that any or all of the nonconforming work performed by Baker Rock Resources on June 22, 2007 results in a failure of the MatCon overly, Baker Rock

Resources, upon proper notice from EPA, shall at its expense, and as the Purchaser's sole remedy proceed expeditiously to re-perform the nonconforming work. In no event shall Baker Rock Resources be required to bear the cost of gaining access to the site in order to perform its warranty obligations.

Baker Rock Resources' liability for nonconforming work shall be limited to the correction of such nonconforming work in the existing designated sections as evidenced in Exhibit 1 as provided herein; however, Baker Rock Resources' liability for correction of defects shall not exceed the replacement cost of the material and installation of the MatCon® overlay sold to the Purchaser for the localized area of the MatCon® where the patch failed. This Warranty applies to the original design and covers all costs for removal of the failed area, disposal of materials from excavation (including Subtitle C soils), all materials required to correct the subgrade, aggregate base asphalt patch, placement of the MatCon® overlay in accordance with all MatCon® quality control requirements, and any and all costs associated with the MatCon® overlay installation including but not limited to necessary special joints and/or sealants. Correction of any defect of nonconformity in the manner and for the period of time provided above shall constitute complete fulfillment of all such liabilities of Baker Rock Resources whether the claims of Purchaser are based on contract, tort (including negligence or strict liability) or otherwise with respect to, or arising out of, the work performed in accordance with the original design section as defined in detail No. 2, Sheet C-15 of the project plans.

This Warranty is not intended to grant any additional warranty rights above those granted in the MatCon® material and Workmanship Warranty provided to the U.S. Environmental Protection Agency by Wilder Construction Company. This Warranty applies only to non-load associated cracking and rutting for Areas 1, 3, 4 and 5 as noted in Exhibit 1.

Under no circumstances will Baker Rock Resources be liable for any special, direct, indirect or consequential damages arising from the loss of production or any other losses, including losses due to personal injuries and product liability owing to the installation or failure of the material. Moreover, no allowance will be made for repairs, replacement, or alterations made by purchaser or owner of the Taylor Lumber and Treating Facility without the express consent of Baker Rock Resources.

THE WARRANTIES EXPRESSLY SET FORTH ABOVE ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

BAKER ROCK RESOURCES

Todd Baker 12/12/07
By: Todd Baker
Title: Executive Vice President

U.S. EPA

James E. Price 1/2/08
By: JAMES E. PRICE
Title: EPA Contracting Officer

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D Low Permeability Asphalt Cap Operation and Maintenance Plan

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**MatCon[®] Operation and Maintenance Plan
Revision 4**

for

Impermeable MatCon[®] Modified Asphalt Cap

At

**Taylor Lumber Superfund Site
Sheridan, Oregon**

Prepared by:

**Granite Construction Company
1525 East Marine View Drive
Everett, WA 98221**

"This data, furnished in connection with this submittal, shall not be disclosed outside the Client and shall not be duplicated, used, or disclosed in whole or in part for any purpose other than to evaluate or implement this MatCon Operation and Maintenance Plan. The Client shall have a right to duplicate, use, or disclose this data to the extent provided in the contract. This restriction does not apply to the Client for its submittal of this document to the regulatory agency(ies) for their evaluation, but does apply to the regulatory agency(ies) as related to their duplication, disclosure and use of the data. The data subject to this restriction is contained on all sheets of this submittal."

August 10, 2009

August 11, 2009

Karen Keeley
Remedial Project Manager
U.S. Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101

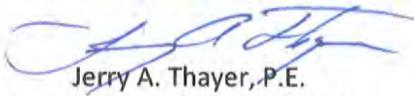
Re: Wilder Construction Company name change

Ms. Keeley,

Effective April 1, 2009, all of our operations merged into one operation as Granite Construction Company, a wholly owned subsidiary of Granite Construction Incorporated. All correspondence should be addressed to my attention, Granite Construction Company, 1525 East Marine View Drive, Everett, WA 98201.

Sincerely,

GRANITE CONSTRUCTION COMPANY



Jerry A. Thayer, P.E.

MatCon Program Manager

Branch / Everett Area Office

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Everett WA 98201-1927
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Fax: 425.551.3116

Whatcom Area Office

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360.676.2450
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Thurston Area Office

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Tumwater, WA 98501
360.352.9205
Fax: 360.352.9403

MatCon[®] Operation and Maintenance Plan Revision 3

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MatCon[®] Operation and Maintenance Plan

A. PURPOSE AND SCOPE

The primary purpose of this document is to provide guidelines for the ongoing operation and maintenance of the MatCon[®] cap at the Taylor Lumber Superfund Site, Sheridan, Oregon. The operation and maintenance requirements are necessary to prolong the integrity and performance of the installation and assure that any failure or potential failure of the low permeability barrier system is discovered and repaired. As a secondary objective, this plan outlines operations and maintenance requirements that are necessary to the care and use of the MatCon cap as a surface suitable for wood treating operations, vehicle traffic and materials storage.

B. STANDARD SITE OPERATION AND OPERATIONAL LIMITATIONS

The site shall be operated such that its use does not conflict with the essential purpose of the cap. "Normal use" of MatCon is defined in the first order as a RCRA cap with a low hydraulic conductivity coefficient of $<1.0 \times 10^{-8}$ cm/sec. Second order use permits wood treating operations, other light industrial operations, vehicular traffic and parking, and storage of materials, placement of light structures such as well as additional cover materials such as soil and vegetation. It is essential that those who manage, direct, utilize, or actually perform work on the surface during ongoing facility operations and those who may plan and/or implement future modified uses for the site realize that the primary intended use of the MatCon cap is as a long-term barrier and containment system of low permeability to environmental contaminants beneath the surface. It is, therefore paramount that all current and future use of the installation be carefully considered and controlled so as to not penetrate, or otherwise inflict heavy damage to the surface of the system, either mechanically, statically, or chemically. Penetrations may be made for site improvement such as anchor points, building tie-downs, utility poles and bollards if the penetrations are designed to prevent water build-up around the penetration and sealed as specified in this document. Specific precautionary considerations are as follows:

1. Loading

The MatCon cap surface is readily resistant to normal operations of rubber-tired vehicles and some heavier equipment. Care should be taken to avoid unnecessary point loads, gouging, or otherwise penetrating the surface with standing or moving loads.

2. Chemical Resistance

Although the MatCon material is resistant to most chemicals, it is not immune to damage caused by petroleum solvents, such as gasoline, diesel fuel, lube oils, transmission fluid, or hydraulic fluid, etc. When inadvertent spills occur, they must be immediately blotted using industrial absorbents and then water flushed and vacuumed to remove any standing fluids. This cleaning should take place as soon as possible to minimize any damage to the MatCon cap. It is recognized that a minor spill may occur over a weekend or other non-work period and may not be discovered for up to several days, however in no cases shall the spill be allowed to remain uncleaned longer than 24 hours after discovery.

3. General Guidelines for Operations

Granite Construction Company provides the following acceptable and unacceptable operational uses for MatCon cap installations. If unacceptable operations are conducted on the MatCon surface, such action will nullify the warranty in its entirety.

ACCEPTABLE OPERATIONS and SURFACE TRAFFIC

- Automobiles;
- Trucks and other vehicles of legal highway loading (not requiring special permits) such as 18-wheel semi truck/trailer, and fuel trucks; Repeated loading (accumulated) traffic of up to 500,000 ESALs (See: Section B.4) or that defined by normal usage of PWPO's operations as defined with the pavement design developed for the project by the design consultant - project no. 342790.PP.03 - dated 8/18/06.
- Pneumatic tired loaders, fork lifts, stackers, etc., with tire-to- MatCon contact pressures of less than 125 psi*;
- Single layer or stacked, empty or loaded ship containers with flat bottoms that impart combined contact pressures to MatCon of less than 125 psi. Loading in excess of 100 psi may cause impressions to be made in the MatCon cap's surface. These impressions will not harm the cap unless they are sharp enough or deep enough to cause cracking or impressions that extends deeper than 1 inch below the surface. The MatCon surface is most susceptible to formation of depressions during higher temperatures. If depressions are not desired by the site operator then additional care should be exercised during higher temperatures to decrease the ground pressure of the load such as by adding an additional piece of dunnage or using wider dunnage. The addition of one 2"x4"x4' piece of dunnage can decrease the surface pressure of a tall stack of wood from 160 psi to 106 psi. Similar reduction in surface pressures can be attained by switching to 2"x6"x4' dunnage if only two sticks of dunnage are to be used. Granite will meet with the site operator to discuss the dunnage issue and will assist the site operator in finding alternatives to the current operations that will impose lower surface contact pressures while minimizing impact to the efficiencies of the current operating procedures.
- Storage of "dry" materials such as sand and gravel directly on the MatCon;
- Storage of other materials if on wood pallets and contact pressure is less than 125 psi; and
- Light buildings with spread footings

THE FOLLOWING OPERATIONS MAY BE DETRIMENTAL AND NEED TO BE REVIEWED WITH GRANITE

- Vehicles with greater than legal highway loading
- Studded or other cold weather traction tires/devices of all types
- Vehicles, loaders, forklifts, stackers, etc. with hard tires imparting contact pressure greater than 125 psi
- Steel (lugged, crawler-type) tracked vehicles (with rubber pads may be acceptable)
- Ship containers or equipment with foot pads, stacking pegs/lugs, rails or other protrusions that come in contact with the MatCon surface
- Excessive point loads and impact loads such as from dropping corners of portable storage containers, heavy equipment bucket teeth, etc.
- Any load imparting contact pressure in excess of 125 psi
- Excessive heavy traffic concentrated in a narrow path (pathways can be varied, however)
- Long-standing water (ponding) over 6 inches in depth.

- Liquid chemicals (solvents) stored or spilled directly on the MatCon. This would include the fueling on the MatCon surface. Such fueling operations would be best done at a less critical location or with the use of an additional layer of MatCon or HMA.
- General abuse caused by heavy scraping and gouging with heavy equipment buckets and other equipment

**Note: Tire air pressure (in psi) is usually less than the tire-to-MatCon contact pressure of 125 psi because of the stiffening effect of truck tire sidewalls.*

4. Typically Proposed Operations

In addition to daily wood treating, operations on this site may include parking of fork lifts, trucks, automobiles, semi-trailers, other future light industrial operations, and storage uses. If the loads are expected to be in excess of 125 psi, there should not be excessive repetitions. Because this use has the potential to inflict damage on the cap surface, precautions should be taken to reduce the opportunity for damage. Rutting or depressions resulting from concentrated heavy use is beyond the MatCon cap's warranty, but such damage can be readily repaired in accordance with the requirements in this plan. Note that such damage may not in itself reduce the permeability of the MatCon surface. It is suggested that a sacrificial layer of high quality conventional asphalt pavement applied directly on the MatCon surface be utilized wherever heavy or excessive use is expected or where operations may damage the surface. Rutting may be minimized or eliminated by varying work paths such as vehicle and forklift routes.

Although the MatCon cap is designed primarily for environmental containment, the surface will carry considerable repetitions of highway-type vehicles. The MatCon cap is warranted for up to 500,000 18,000 lb. Equivalent Single Axle Loads (ESALs) before requiring structural repair and/or overlay consideration within the warranty period. The accumulated number of ESALs over a given surface area or access driveway can be calculated from the data in Table 1 (Attachment A) similar to the following example:

Example: A fully loaded panel truck with a single front axle (10,000 lb.) and a tandem rear axle (40,000 lb.).

Front axle Load equivalency factor (from Table 1)	=	0.0877
Rear axle Load equivalency factor (from Table 1)	=	<u>2.0800</u>
Number of 18,000 lb. ESAL per operation	=	2.1677

This vehicle entering and leaving each day for 5 days per week over the same surface area results in (2.1677 ESALs x 2 passes x 5 days/week x 52 weeks per year) 1,127 ESALs per year on that particular surface area. Note that the heaviest traffic will probably be the driveway entrance to the site.

An assessment of the affect on the MatCon cap of any proposed changes in the use of the facility shall be made prior to implementing such changes. Heavy and/or prolonged use of the facility in concentrated areas, or changes in use of the facility should also trigger interim or more frequent inspections and evaluations.

An inspection of all affected areas of the cap shall also be performed at any time a site incident, activity, or atypical weather event may have caused reason to suspect potential damage to the MatCon system.

C. VISUAL INSPECTION AND EVALUATION

1. Inspection and Evaluation Schedule.

The inspection process is a key part of evaluating and maintaining MatCon performance. When the MatCon cap is exposed, it is relatively easy to make required routine and regular inspections. There will be three types of inspections as follows:

- a. Annual. Granite Construction Company will perform a thorough evaluation at the conclusion of construction, and again at each 1-Year anniversary of construction thereafter during the 5-year warranty period. Similar annual inspections, providing a detailed assessment of the MatCon cap, shall be conducted by the owner/operator at one-year intervals thereafter. Any inspections performed at times corresponding to any regulatory agency planned reviews should be coordinated with and accomplished prior to or as part of this annual review. The owner, U.S. EPA and/or state or local regulators can be alerted at least 30 days prior to all annual inspections, to allow them for their participation, should they so choose.
- b. Informal. The owner/operator shall make routine and regular visual inspections during the design life as a normal part of their operations.
- c. Special. Interim inspections shall be made of all affected areas of the cap, at any time a site incident, activity, or atypical weather event may have caused reason to suspect potential damage to the MatCon system. Such inspections shall also be made if there are changes in use of the facility or if the site is subject to heavy and/or prolonged use in concentrated areas.

Since Granite Construction, designed the MatCon asphalt mix, provided the binder material and quality assurance during construction and has warranty responsibilities, they shall be afforded an opportunity to participate in all inspections during the warranty period. In addition, Granite may request the results of any inspections made by the owner/operator during the warranty period. Granite reserves the right to make more frequent inspections to facilitate proper operation and maintenance, as it feels necessary.

2. Inspection Requirements.

A visual inspection will require a careful walking of the entire surface and careful documentation of any notable features and surface uses. Although the distress types to be considered, (as noted in Section C.4, below), are most important, annual inspections shall also include the following information:

- Name, position and employer of inspector(s)
- Date, time, and weather conditions at time of inspection.
- Carefully prepared scale map of the facility such as an as-built drawing, to note location and type of any distress, and/or activity (storage, new structures, etc.) using GPS coordinates.
- Description of use since last inspection and comments on any planned changes
- Photographs, including overall views showing current use and condition as well as close-up views of any distress such as cracking, ponding, and referenced to any descriptive notes.
- Vital information such as when the cap was constructed, the contractor, previous maintenance, or etc.

- Location and extent of any areas not inspected due to temporary storage items obscuring visibility.
- Location and condition of any penetrations such as tie-downs and the condition of the mastic seal material, including the possible need to re-seal.

3. Inspection Procedures.

Inspector(s) shall review as-built drawings and previous MatCon cap inspection reports prior to the inspection to familiarize themselves with the purpose and current status of the cap. The inspection will require a carefully planned walking inspection of the entire cap surface. All notable features shall be carefully documented in the report, on the data form (Attachment A) and on the site drawing. Any accumulated sediment and /or vegetation discovered on the surface shall be removed. Any contact between the MatCon cap and concrete or any other non-MatCon materials shall be inspected for separation or cracking,

A standardized procedure shall be used for the inspection by trained professionals so that results can be compared consistently to previous inspections. The standardized procedure for annual inspections shall utilize the “MatCon Cap Inspection Report” form attached as Attachment A.

At the time of construction, Granite will instruct the owner/operator of the site in the techniques and reporting operations when they make the “as-built” evaluation. The report requires only observations of operations and any observed distress and noting their location using GPS coordinates. If distress such as a crack is observed, only the reporting of it is required by the owner/operator of the site, without interpreting the cause and/or mitigation, unless the cause of the distress is actually known. Granite may follow up with a more detailed evaluation as needed either at the time of the next annual inspection or immediately if warranted by the situation. Such reports and associated communications shall become part of the performance record. Suspected warranty problems or defects should be reported within 48 hours of discovery. Since many such problems or defects may be discovered during an inspection, an annual or special inspection report that indicates a problem or defect that may be a potential warranty issue shall be considered acceptable warranty notification.

4. Types of distress.

There are several types of distress that may affect the MatCon surface that may be observed during inspections. The following discussion is intended to provide a general understanding of the types and causes of possible MatCon material deterioration with use and time. It is important, if observed, that they are noted in the annual inspection. An experienced pavement engineer can often determine the cause of distress through analysis of the nature, location, type, and severity of the observed distress, and thus determine the best repair solution.

In order to ascertain responsibility for maintenance or repair under Granite’s warranty, it is helpful to classify the distress types as to their origin and probable cause.

Distress to MatCon that is covered by warranty.

- Excessive weathering or disintegration
- Thermal cracking (non load-associated)
- Fatigue cracking (load-associated), if it occurs prior to the 500,000 ESAL limitation within the warranty period and is not related to underlying materials.

Distress to MatCon that **is not** covered by warranty.

- Abrasions, scuffing, or surface wear caused by equipment use.
- Settlement, subsidence, ponding of water caused by changing of underlying materials.
- Deformation or rutting caused by localized traffic or storage loading.
- Fatigue cracking (load-associated), unless it occurs prior to the 500,000 ESAL limitation within the warranty period.

The terminology used in environmental cap and cover facilities is different from that utilized to describe work, storage, traffic and other pavement surfaces. A clear understanding of the terms used in this plan is essential its proper implementation. The following is, therefore, established:

Remedy Failure - The condition where the entire MatCon cap no longer performs as a RCRA cap under the first order use of the site. It is unlikely that this condition could exist as a MatCon cap can always be repaired.

Distress - An impact to an area of the MatCon cap that may require repair, replacement, or other corrective actions so that either the primary or secondary uses of the site are continued.

Localized Distress - A state of distress present with certain definable surface areas of the MatCon cap that compromises permeability, and thus the first order of use as a RCRA cap, and is beyond routine maintenance repairs requiring corrective fog sealing, patching, overlay, and/or subgrade or base repair. Localized failures can be repaired, replaced, or managed to allow both first and second order use.

Distress mechanisms such as thermal cracking are readily apparent when they occur. But other forms of distress such as weathering or disintegration can affect permeability, but are less obvious and some regular sampling and testing is required. Most distress can be managed through maintenance and repair actions so that impermeability is maintained. Most distress that may recur is likely to be localized, e.g., a soft spot in the underlying soil causes a crack. Another example would be fatigue cracking in the driveway, where truck traffic is focused. These and even occasional thermal cracks are localized “distress” rather than failure. Remedy failure would imply the need to replace or overlay the entire MatCon cap, and would be highly unlikely under any circumstances.

The following discussion is a general overview and description of distress types and can be used in conjunction with the inspections.

- **Surface deterioration.** Weathering, abrasion, scuffing, raveling, or surface wear that might be attributed to either environmental exposure or possible traffic. Comparison to unexposed or untrafficked areas during the inspections is helpful. If weathering is noted, consider the possible need for a restorative fog seal.
- **Settlement, subsidence, ponding of water.** These situations are most likely caused by changing conditions of the underlying soil or waste rather than the MatCon cap. Localized differential settlement may cause some cracking, while widespread subsidence or consolidation most likely will not. Ponding of water may need to be corrected by overlaying to change the surface grade. Note the location and extent as well as depth. Spray paint demarcation on the MatCon surface will facilitate future inspections and spot relocation.

Deformation or rutting. If heavy use such as equipment storage, fork lifts, pole lifters and truck traffic or parking has caused deformation, this should be noted separately from that caused by general settlement or consolidation. For example, repeated passes of heavy trucks may cause broad localized deformation that, in turn, results in cracking of the MatCon surface. Any distress will need to be repaired, but assessment of the cause and appropriate corrective measures are important to future performance. Minor deformation without cracking is tolerable and to be expected.

- **Cracking.** The two main types of cracking that may be observed are fatigue (caused by repeated heavy loads or “load-associated”) or thermal (caused by low temperature and temperature fluctuations or “non load-associated”).

Although it is possible to get fatigue failure on a MatCon cap serving as a RCRA cap, it may also be an indication of abuse of the intended use. Fatigue or “alligator” cracking may be associated with repeated deflections under truck traffic.

Thermal cracking is of most concern in broad expanses of asphalt pavements. Wide changes in air temperature, both long term (summer vs. winter), or short term (diurnal) are detrimental to the integrity of these facilities. As the temperature decreases, asphalt cools and wants to shrink, but is restrained by friction at the interface between the asphalt and underlying base material, and tensile stress builds up. If the temperature changes slowly, there is time for stress to be relieved in the asphalt binder (called stress relaxation), since it is viscoelastic. But if the change is rapid, such as overnight, there may not be time for stress to relax and it builds to a level that exceeds the strength, hence a crack.

The design and materials used in MatCon reduce the tendency to crack compared to conventional or standard asphalt. MatCon is stronger and more elastomeric (stretches further without breaking). However, extreme situations may still cause cracking, such as thermal stress in combination (additive) with differential settlement. Often in conventional asphalts, thermal cracks do not penetrate a full 4-in. thickness, but start on the surface and progress only a short distance into the mat, then stop. Full depth cracking in MatCon, if encountered, will need to be repaired, while surface checking may be corrected by a seal coat. Note the length (on map), depth, and width of cracks so that an estimate of required repairs may be made without re-surveying them.

- **Performance of prior repairs.** If present, a careful look at previously repaired cracks, core holes, sealing around pipes, foundations, patches, etc., needs to be made to assess how well they are doing. Any gaps or cracks caused by shrinkage or loss of adhesion should be noted, and close-up photographs taken so that comparison can be made to previous inspections. These MatCon cap repairs are made with modified binders, and paved or placed hot, so some shrinkage may occur and will need to be assessed to determine if follow-up repair is needed. Under no circumstances should the MatCon cap be repaired using conventional hot-mix asphalt or conventional asphalt binder. Use of MatCon hot-mix or binder is always preferred as that is the material that produces the impermeability and flexural properties.

5. Hydraulic Conductivity Monitoring.

If site conditions cause a concern that the MatCon cap may have a loss of impermeability, Granite may collect two core samples during an annual inspection of the MatCon during the five year material warranty. Samples will be analyzed for hydraulic conductivity by a reputable laboratory in

accordance with ASTM D5084, Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials using Flexible Wall Permeameter.

If taken, the two core samples will be from locations that appear to be representative of the site. The need to minimize perforations of the MatCon surface to maintain integrity is essential to long-term performance. Therefore, core sampling should be confined to a non-critical area, outside of traffic zones, whenever possible. Backfilled core holes may become a point of stress concentrations under loading.

If the tests on the core samples show the coefficient of permeability to be less than 1×10^{-8} cm/sec, no action would be required. If the test results show that the permeability is greater than 1×10^{-8} cm/sec, or if the trend from previous tests show increasing permeability with time, Granite may elect to fog seal the area as a preventative measure. It is difficult to predict the scenarios that may occur in future years. But if the core sample testing shows marginal permeability results or there is concern because of adverse testing to define the extent and severity of increased permeability, Granite may elect to perform additional sampling and testing to define the extent and severity of increased permeability. At Granite's option, all of the MatCon surface or only selected areas may receive a fog seal to reduce the permeability, while still meeting the warranted performance. Increased permeability can also be addressed by implementing changes in the surface operations and maintenance. This same procedure is required for the time period beyond Granite's warranty as part of this maintenance plan. Granite reserves the right to analyze the core samples for other test parameters at its discretion. All permeability data will be presented in the annual inspection report.

6. Overall assessment of performance.

The inspection report shall summarize the general condition of the MatCon cap by checking the appropriate rating on the MatCon Inspection Report form included as Attachment A. Annual inspections shall also provide a narrative discussion that includes the inspector's reasoning and any special conditions not already covered. Most important - the report shall make recommendations as to what to do and when. Photographs and the site drawing shall be attached. Finally, the inspector shall discuss the evaluation and recommendations with the owner or operations manager before leaving the site. A copy of all reports shall be sent to Granite Construction Company. Additional copies shall be maintained by the Owner, the Engineer, and/or sent to the applicable regulatory agency as required. Upon review of the report, and in conjunction with the Owner/Operator, Granite shall make recommendations as to the determination and timing of any required corrective action(s).

7. Thin Slice Rheology Analysis.

Granite agreed to provide a method for a long-term analysis of stiffening of the MatCon HMA over time. Five sample locations were marked-out by CH2M HILL and six-inch diameter cores were removed from these locations. The core samples were sent in for thin slice rheology testing to determine the stiffness of the MatCon HMA as installed. The test will be conducted and the results reported as outlined in the Taylor Lumber QC Plan.

Initially, five samples will be analyzed, but given the expense of the test and likelihood that yearly changes will be very small as to not be detectable, subsequent testing will only be performed at 2.5 and 5 years on one sample each from the north and south halves of the site. These sample locations will be selected in conjunction with the EPA based on the results from the initial tests from five locations. These tests are being conducted for informational purposes only and will not be used to determine the performance of the cap.

Testing will be conducted by MTE Services Inc. using the method described in reference - *Gerald Reinke and Stacy Glidden, "Development of Mixture Creep Performance Tests Using a Dynamic Shear Rheometer," Transportation Research Circular EC068 - New Simple Performance Tests for Asphalt Mixes, Transportation Research Board. pp. 1 to 14, 2004.*

Granite will provide an interpretation of the Thin Slice Rheology data to the EPA.

D. RECOMMENDED MAINTENANCE AND REPAIR PROCEDURES

All deficiencies identified in the inspection report shall be corrected or repaired in accordance with this plan. Once these corrections or deficiencies are complete a Corrective Action Report shall be prepared documenting the repair activities. A copy of this report shall be sent to Granite Construction Company, the Owner, the manager of the facilities operations, and the applicable regulatory agency as required.

1. Crack Sealing.

Any crack that is at least one inch deep shall be routed out rather than sawed or cut because better control can be achieved. A cross-section configuration as shown in Figure 1 is recommended because it provides both a reservoir for sealant and additional sealing at the lips of the crack. A vertical-spindle router is least damaging and most maneuverable to follow random cracking. Rotary-impact routers may be more productive, but also tend to cause more damage along the edges.

Following routing, air blasting is required to remove dust, debris, and any loosened fragments. Hot air blasting with a compressed-air lance or heat lance is required to help remove any moisture and it aids in improving the bonding of hot-applied sealant. The sealant shall be applied immediately following hot air blasting.

Granite recommends the following crack sealers

Hot-applied thermoplastic crack sealer can be applied using an asphalt distributor, but it is much better to use an asphalt kettle/melter. Modified asphalt material must be heated to a higher temperature than can be achieved and maintained with a distributor. Application can be done using a dish-shaped attachment at the end of the crack filling wand for one- step application. However, to assure that the crack and routed reservoir are uniformly filled, it may be best to use two steps: first fill the crack with the application wand and immediately shape the top using a 'U' - shaped industrial squeegee. Blotting with sand is probably not required with modified asphalt and since it is unlikely to be trafficked, as in a highway.

For this site, Granite Construction Company recommends Crafcop Parking Lot Sealant 34200, or equivalent, available from:

Crafcop, Inc.
420 N Roosevelt Ave,
Chandler, AZ 85226
800-528-8242
www.crafcop.com

An alternative cold-applied crack sealer can be applied by pouring from container or by caulking tube at temperatures above 50o F if no precipitation is expected during the drying period. Prepare and apply material in accordance with manufacturer's specifications. For cracks deeper than 0.25 inch apply in layers allowing 2 – 3 hours curing time between applications. For this site, Granite Construction Company recommends Hyperflex Multipurpose Caulk, or equivalent, available from:

Hyperseal, Inc.
34901 Spyder Circle
Palm Desert, CA 92211
760-343-0626
www.hyperseal.com

Contact the MatCon cap manufacturer Granite Construction Company, 1525 East Marine View Drive, Everett, WA 98221, phone (800) 377-0954 for other acceptable crack sealers if these are not available. The selection and evaluation of other types and grades of material will be approved by Granite Construction to assure compatibility with the MatCon surface.

A few days following crack sealing, the work should be inspected and any defects re-sealed.

Routine crack sealing of occasional or sporadic cracking will be adequate to maintain the MatCon cap's primary function as a low permeability RCRA cap. A few days following crack sealing, the project should be inspected and any imperfections touched up. Previously sealed cracks will be inspected on a quarterly schedule, and re-sealed as necessary. It is unlikely that cracking would extend over a wide area or the entire project, and is more likely to be localized. However, if non load-associated cracking increases with time, consideration should be given to alternative repairs. For example, if cracking caused by differential settlement or thermal conditions extends or increases such that crack spacing is less than 5 feet within the localized area, consideration should be given to patching or overlaying that area. The decision is one of economics, since both repair methods will maintain low permeability. Crack sealing is a low cost option, so more extensive repairs will need to be carefully considered before a decision is made to replace or overlay the MatCon.

Regardless of cost considerations, the accumulation of a total 100 linear feet of cracks that are repaired by sealing within a 320 sq.ft. area, shall trigger either of the following actions:

- 1) Exclude and isolate the repaired area from any surface traffic, use or loading, by means of permanent fences or barriers; or
- 2) Remove the distressed area and replace with new MatCon material using proper cold joint methods. Such replacement may also require underlying base course material removal and reconstruction prior to reinstallation of MatCon material.

With either alternative, the MatCon cap's low permeability and performance as a RCRA cap will be maintained. The presence of 100 linear feet of cracks within the 320 sq. ft. of the MatCon cap

does not constitute a failure as a RCRA cap, however, it does establish a limit for the use of the cap as a work, storage, or traffic area, unless it is replaced.

The 100 linear feet limit of repaired cracks is based upon the size of the unaffected MatCon cap areas and their collective stability within the area when subjected to a surface load. The 320 square feet surface area is consistent with the dimensions of an eight (8) feet wide by forty (40) feet long semi-truck and trailer, or ship container. Even if properly repaired cracks exceed the 100 linear feet per 320 sq.ft. surface area limit, the repaired MatCon cap will still serve the primary intended purpose as a RCRA cap. However, subsequent surface use and loading may further distress the area beyond cost beneficial and effective repair.

2. Fog Seal

A fog seal may be desired latter in the life of the MatCon cap as a surface treatment. It is a uniformly sprayed application of a specially prepared modified-asphalt emulsion. It is applied with a distributor for most areas and for close quarters or adjacent to structures, pipes, etc., a wand with a single spray nozzle is best used.

Cleaning prior to seal coating can generally be accomplished using a power broom and/or truck mounted vacuum cleaner to remove dirt and loose debris. In some instances, water jets may be required to loosen dirt or mud that is adhered to the MatCon surface.

The surface must be dry and above 60°F at the time of application. Warm weather is required for the emulsion to 'break' and cure properly. Application rate should be approximately 0.50 gallon per square yard. The actual rate may be adjusted and fine-tuned at the beginning of the project to account for surface texture and curing rate. The selection of type and grade of material will be approved by Granite Construction to assure compatibility with the MatCon surface.

3. Seal Coat

A seal coat may be used to fill small voids from grinding operations, but is not required to maintain the warranty. The surface to be coated shall be cleaned prior to seal coating and can generally be accomplished using a power broom and/or truck mounted vacuum cleaner to remove dirt and loose debris. In some instances, water jets may be required to loosen dirt or mud that is adhered to the asphalt surface.

The surface must be dry and above 60°F at the time of fog seal application. Warm weather is required for the emulsion to 'break' and cure properly. Application rate should be approximately 0.10 gallons per square yard. The actual rate may be adjusted and "fine-tuned" at the beginning of the project to account for surface texture and curing rate. The selection of type and grade of material will be approved by Granite to assure compatibility with the MatCon surface.

For this site, Granite Construction Company recommends Special Asphalt Products Resurfacer XLR8, or equivalent, available from:

Special Asphalt Products
3537 NW St. Helens Road
Portland, OR 97283-0295
503-295-6490

4. Patching and overlay.

In some instances, a large crack or depressed area may need to be patched using MatCon material or other Granite approved material. Patches may range from a few square yards to much larger areas. These materials and construction procedures will follow the same high standards and protocols required for the original MatCon cap installation.

An advantage of patching a MatCon cap is that, in most instances, the original MatCon surface will not be cut out and removed. Rather, the patch, or overlay, can be shaped to cover the crack and tapered at the edges to provide a smooth transition. An example is shown in Figure 2. A patch can also be used to correct the grade and drainage of the surface (ponding, for example) when localized subsidence has changed the profile. Any cracks will be sealed prior to patching. Thickness of the overlay may be variable, but in critical areas should not be less than four (4) inches. Multiple overlays (layered) may be required to correct extreme settlement. All edges, tapers, and surfaces of the patch should be fog sealed at the time of construction.

For areas that are cracked and no differential settlement has occurred, crack repair may require more elaborate procedures as shown in Figures 3 and 4. Shallow cracks or gouges can be repaired after milling out about 1 inch as shown in Figure 3. If a crack extends through the entire MatCon surface, then all the material adjacent to the crack should be removed by sawing. A multi stage operation providing a step configuration, such as a MatCon cold joint, is preferred.

For areas such as driveways or aisles where heavy traffic is concentrated, fatigue cracking may occur and will require special repair techniques. Fatigue or alligator cracking of the MatCon cap is caused by repeated flexure of the mat. The material can accommodate accumulated repetitions whether they are caused by excessive wheel loading, or by soft underlying foundation materials; but it does not know the source. A typical area of fatigue distress would be a driveway 10 feet wide, with 5% of the area (i.e., wheel paths) exhibiting alligator cracking.

A wheel path exhibiting fatigue cracking is often accompanied by a depression, or rut, within the wheel path. By definition, if the maximum depression (measured with a straight edge across the wheel path) is less than ¼ inch, the fatigue cracking is caused by loading alone. If the depression (rut) is greater than ¼ inch, the cracking is also caused by repeated strain, but in turn, higher strain is induced because of soft or consolidating underlying foundation materials.

Any fatigue cracking discovered during an inspection and evaluation must be repaired, following the method for patching. If the accompanying rut or depression is greater than ¼ inch deep, it is caused by changing foundation materials, and is not covered by warranty. If the rut or depression is less than ¼ inch deep, it is more likely caused by traffic loading and falls under the 500,000 ESAL limitation. If at any time during the warranty period the cumulative ESALs have exceeded 500,000, the repair is not covered by the warranty. Corrective action following repair would include review and modifications to surface use operations. Subgrade failure distress mechanisms (e.g., upheaval, settlement, etc.) that impact MatCon integrity must be mitigated and repaired prior to any MatCon replacement.

The selection of type and grade of material will be approved by Granite Construction to assure compatibility with the MatCon surface. If the approved material(s) are unavailable, contact the manufacturer Granite Construction 1525 East Marine View Drive, Everett, WA 98221, phone (800) 377-0954 for acceptable substitutes and the EPA for approval.

5. Traffic Control Striping

The basic concept is to reduce the reflectance or albedo of the stripe to a value near that of the MatCon surface itself. The reason for this is that the MatCon mixture expands and contracts at a different rate under the stripe because of different reflectance during hot sunny days and cool nights. The result may be surface cracking along the edge of the stripe due to this repeated heating and cooling. One may observe this phenomenon yourself at crosswalks, etc.

Ideally, Granite would like a black colored stripe (similar to that often used on portland cement concrete). This will work after a year or so when the surface has turned gray, providing sufficient contrast for parking delineation. But since newly paved surfaces will still be black, a higher contrast stripe is required. Conventional striping paint materials will suffice, with the following comments and recommendations:

1. Paint should be water-based so that it can be thinned or reduced with water. This will eliminate the solvents used in other types, and will reduce any possible damage to the MatCon Binder. An example would be Fast Drying Water Reducible Acrylic, available from LaFarge Road Marking (www.lafargeroadmarking.com). But there are others on the market that will be familiar to the local paint applicators.

2. Yellow or white color is acceptable. Some other color such as green or blue is also ok.

3. Reduce the paint with water sufficiently to reduce the coverage to no more than one-third of what is normally used. This thinned paint should be applied at the same forward speed of the striping machine as is normally used, in order to achieve the lighter coverage. When painters use this procedure, the tendency is to slow down to apply more paint so that it looks like what they are accustomed to doing.

4. The idea is to reduce the density of color to less than one-third that of a solid stripe. The result will be stripes that look like they have been down for two or three years instead of new, but will still serve to provide guidance to drivers.

6. Sealing to Concrete Slabs and Structures

A seal is required at joints where the MatCon cap abuts concrete structures. Typically, the concrete slab should be in place prior to paving with MatCon. The exposed concrete slab edge should be coated with a heavy asphalt tack coat or MatCon Mastic (a highly modified, hot-applied asphalt based sealer provided by Granite Construction Company). The MatCon paving operation should be completed within 24 hours of coating the edge. After the paving operation is completed, the surface joint is further sealed with another coat at the joint line as in a fillet.

Two common options to seal are (a) straight abutment, and (b) step design. Figure 5A shows the details of the abutment with a concrete structure such as a foundation or slab, and should be prepared with mastic as described above. Figure 5B shows an option where an exceptionally good seal is needed, such as in a pond that will hold standing water. The foundation or wall is designed with a step, so that the MatCon has a larger area of contact as well as a direct bearing on the concrete step, decreasing the likelihood for leakage

7. Sealing Penetrations

Penetrations are often needed to add features such as fence posts light standards or tie-downs, for example. It is advantageous to pave the entire site prior to installing penetrations whenever possible, because the density, voids, and permeability are better controlled. Penetrations can be saw-cut or

core-drilled, resulting in smooth sides. Jack hammering is not recommended. The hole should be about 1-inch oversized (1/2-in minimum space for penetration) and hot MatCon Mastic applied in the resulting void. Assure full penetration to seal the opening around the feature. After cooling, the mastic should be topped up as shown in Figure 6 in the form of a “fillet” to assure a tight seal and to prevent water from standing at the joint.

8. Surface Impressions

Some of the surface area in the Northeast corner of the Taylor Lumber Site have depressions as a result of static loads. These areas were highlighted by the EPA during the Alternate Dispute Resolution site walk on February 5, 2008. These depressions will be rolled in 2008, during the summer by a pneumatic roller in an attempt to smooth the MatCon surface. The followings are guidelines for the procedure:

- Granite will coordinate a date when the weather is expected to be hot enough for the rolling to have an effect;
- Granite will coordinate the rolling locations with PWPO and the EPA, Region 10 ;
- PWPO will make the areas available for rolling on that date and will not use the affected areas for 48 hours following the remedial action;
- Granite will furnish a pneumatic roller and roll the areas during the hottest time of the day; and
- Granite may add additional heat to the material to allow greater compactive effort by increasing the depth of compaction over that caused by normal site operations.

Granite anticipates three potential outcomes from the rolling test with the following courses of action that will be taken by Granite depending on the results of the rolling test;

8.1 The surface will not roll out indicating that the material has stiffened and will now support loading without excessive depression formation. Granite will diamond grind the surface to a depth that will remove the surface impressions to no more than 1/4 inch depth. Granite will then seal coat the surface to help fill in the remaining depressions and inadvertent grinding marks.

8.2 The surface will roll out and support more loading than it did originally indicating that it is stiffening with time, but has not yet fully stiffened. Granite will repeat the rolling test during the following summer in accordance with this section. Granite will repeat the rolling test each year until the material is determined to no longer respond to rolling. If PWPO determines that the surface is still too bumpy for operations after it has stiffened and no longer responds to rolling. Granite will diamond grind the surface and seal coat it. Granite will use MatCon binder for the overlay taking care in the mix design process to assure stiffness.

8.3 The material will roll out, but is still as soft as when initially placed indicating that it is not stiffening with time. Granite will overlay the surface of the MatCon cap with 1.5 – 2.0 inches of asphalt pavement (mix type to be determined) to bridge the surface and prevent subsequent formation of depressions. The overlay will be “keyed-in” to the adjacent MatCon cap by grinding approximately 1.5 in. to create a smooth transition to the overlay surface. Care will be taken to maintain surface drainage away from structures and building entrances. Any proposed overlay work will be coordinated with PWPO to coordinate scheduling and to review drainage issues and edge transitions.

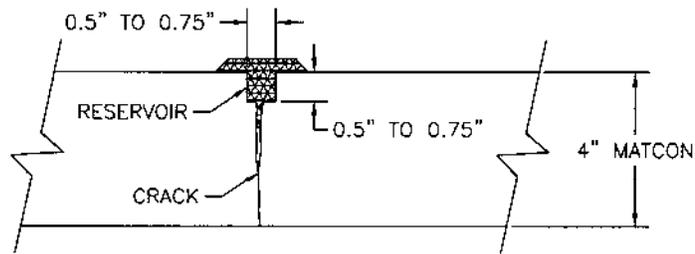


FIGURE 1: CROSS SECTION OF CRACK SEALING GENERALLY CALLED A STANDARD RECESSED BAND-AID

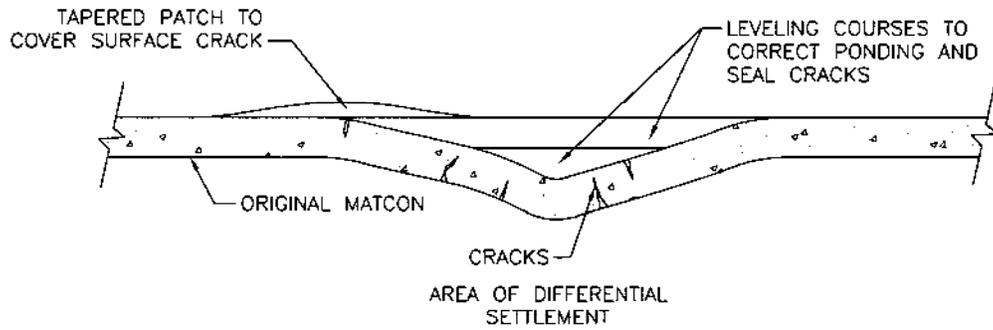


FIGURE 2: TYPICAL PATCHING CONFIGURATIONS

Not to scale

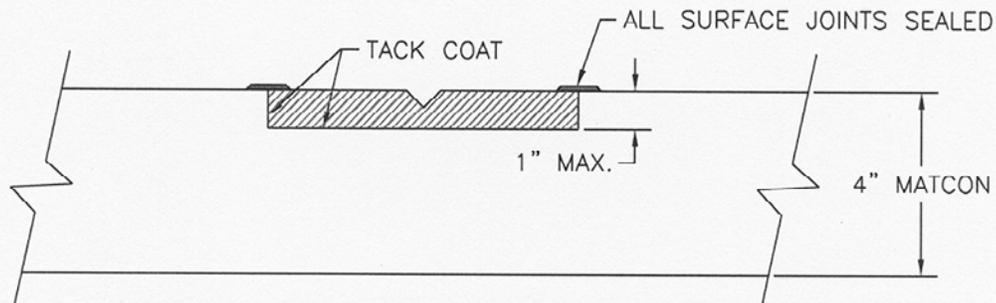


FIGURE 3: SHALLOW PATCH TO REPAIR SURFACE DEFECT. MILL OUT AREA TO BE PATCHED TO A DEPTH NOT TO EXCEED 1". INLAY WITH HIGH QUALITY MATCON MIXTURE AFTER APPLYING HEAVY TACK COAT. SEAL ALL EDGES.

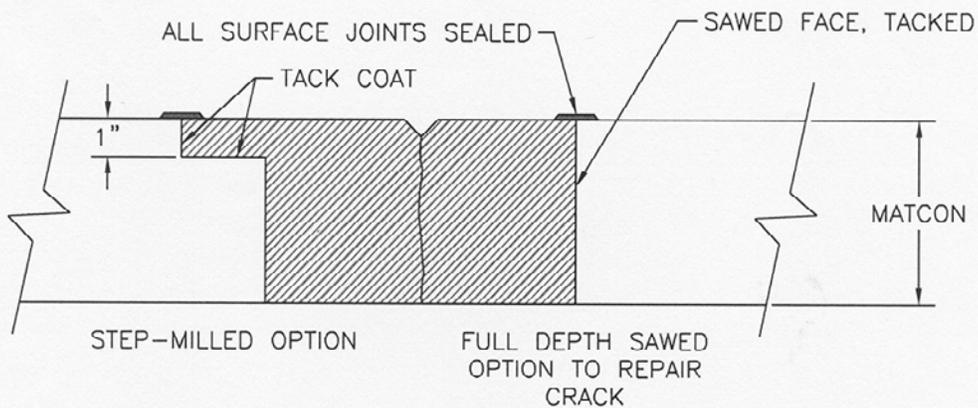


FIGURE 4: FULL DEPTH PATCH TO REPAIR CRACK. REMOVE MATCON BY SAWING OR MILLING IN SEVERAL PASSES TO MINIMIZE DAMAGE TO ADJACENT MATCON. TACK COAT ALL SURFACES. PLACE MATCON PATCH MIXTURE IN TWO LIFTS - BOTTOM LIFT PLACED, THEN IMMEDIATELY FOLLOWED BY TOP LIFT AND COMPACTED. SEAL ALL EDGES.

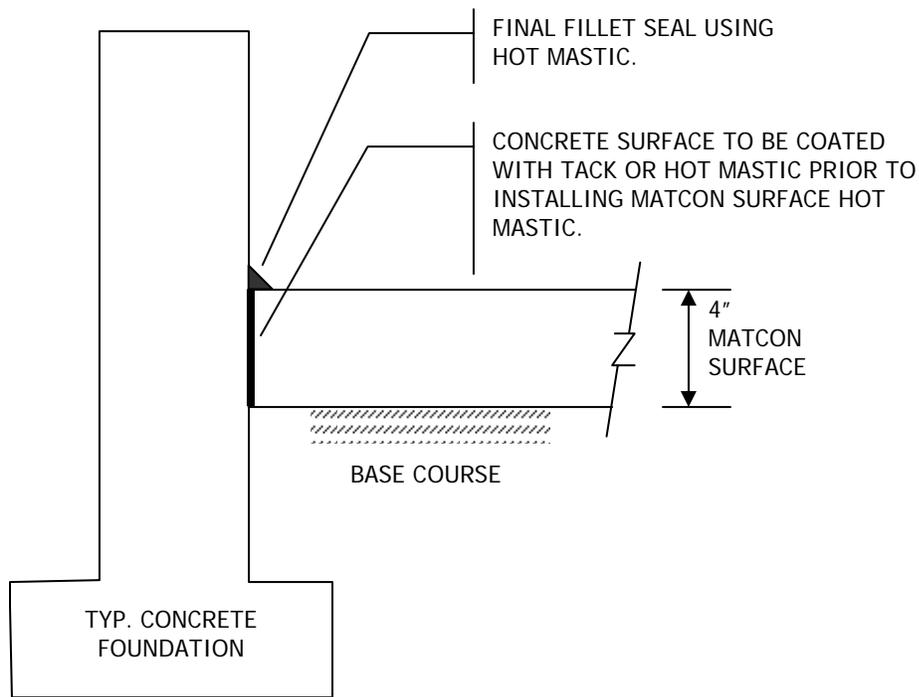


FIGURE 5A: SEALING THE EDGE OF A MATCON SURFACE PLACED AGAINST AN EXISTING CONCRETE STRUCTURE. CONCRETE SHOULD BE DRY AND CLEAN BEFORE APPLYING TACK OR MASTIC. COMPACTION EQUIPMENT SHOULD “PINCH” HOT MATCON MATERIAL AGAINST THE CONCRETE STRUCTURE AS TIGHT AS CONDITIONS WILL ALLOW. THE FINAL SEAL SHOULD BE A “FILLET” OF MASTIC IN THE CORNER OF THE INTERSECTION AS SHOWN.

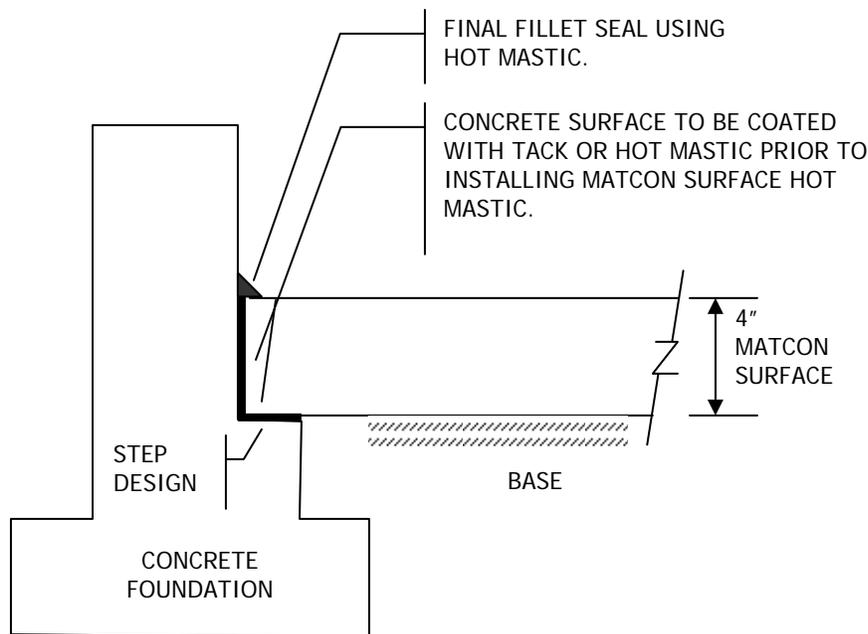


FIGURE 5B: SEALING THE EDGE OF A MATCON SURFACE PLACED IN A “STEP” IN A CONCRETE STRUCTURE. THIS DESIGN MAY PROVIDE A LARGER AREA FOR SEALING AND SEATING A MATCON SURFACE. SEE FIGURE 5A FOR ADDITIONAL NOTES.

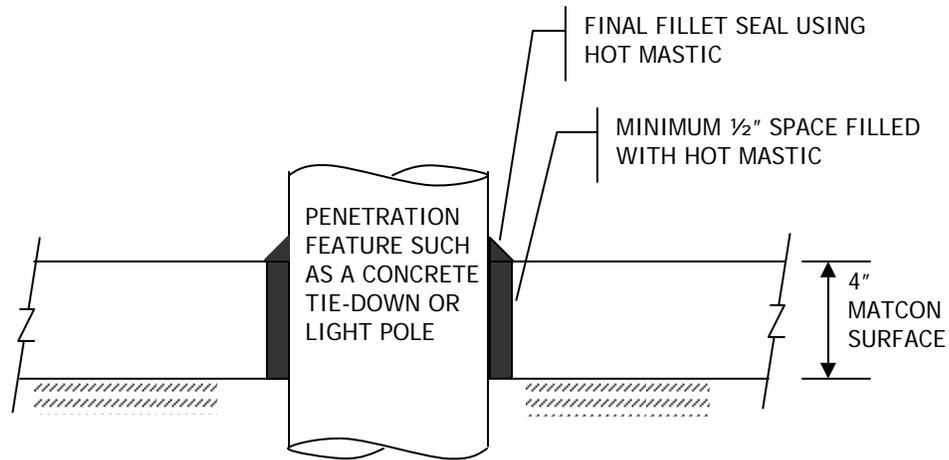


FIGURE 6: SEALING FULL DEPTH PENETRATION IN MATCON SURFACE. REMOVE MATCON MATERIAL BY SAWING OR CORING. ALLOW SPACE FOR HOT MATCON MATERIAL OF AT LEAST 1/2". APPLY HOT MATCON MASTIC USING A MELTER AND HOT LANCE NORMALLY USED TO FILL CRACKS (SEE FIG 1). WHEN THE MASTIC HAS COOLED, "TOP UP" AROUND THE EDGES BY APPLYING A "FILLET" OF HOT MASTIC.

TABLE I LOAD EQUIVALENCY FACTORS

Gross Axle Load		Load Equivalency Factors		Gross Axle Load		Load Equivalency Factors	
kN	lb	Single Axles	Tandem Axles	kN	lb	Single Axles	Tandem Axles
4.45	1,000	0.00002		182.5	41,000	23.27	2.29
8.9	2,000	0.00018		187.0	42,000	25.64	2.51
13.35	3,000	0.00072		191.3	43,000	28.22	2.75
17.8	4,000	0.00209		195.7	44,000	31.00	3.00
22.25	5,000	0.00500		200.0	45,000	34.00	3.27
26.7	6,000	0.01043		204.5	46,000	37.24	3.55
31.15	7,000	0.0196		209.0	47,000	40.74	3.85
35.6	8,000	0.0343		213.5	48,000	44.50	4.17
40.0	9,000	0.0562		218.0	49,000	48.54	4.51
44.5	10,000	0.0877	0.00688	222.4	50,000	52.88	4.86
48.9	11,000	0.1311	0.01008	226.8	51,000		5.23
53.4	12,000	0.189	0.0144	231.3	52,000		5.63
57.8	13,000	0.264	0.0199	235.7	53,000		6.04
62.3	14,000	0.360	0.0270	240.2	54,000		6.47
66.7	15,000	0.478	0.0360	244.6	55,000		6.93
71.2	16,000	0.623	0.0472	249.0	56,000		7.41
75.6	17,000	0.796	0.0608	253.5	57,000		7.92
80.0	18,000	1.000	0.0773	258.0	58,000		8.45
84.5	19,000	1.24	0.0971	262.5	59,000		9.01
89.0	20,000	1.51	0.1206	267.0	60,000		9.59
93.4	21,000	1.83	0.148	271.3	61,000		10.20
97.8	22,000	2.18	0.180	275.8	62,000		10.84
102.3	23,000	2.58	0.217	280.2	63,000		11.52
106.8	24,000	3.03	0.260	284.5	64,000		12.22
111.2	25,000	3.53	0.308	289.0	65,000		12.96
115.6	26,000	4.09	0.364	293.5	66,000		13.73
120.0	27,000	4.71	0.426	298.0	67,000		14.54
124.5	28,000	5.39	0.495	302.5	68,000		15.38
129.0	29,000	6.14	0.572	307.0	69,000		16.26
133.5	30,000	6.97	0.658	311.5	70,000		17.19
138.0	31,000	7.88	0.753	316.0	71,000		18.15
142.3	32,000	8.88	0.857	320.0	72,000		19.16
146.8	33,000	9.98	0.971	325.0	73,000		20.22
151.2	34,000	11.18	1.095	329.0	74,000		21.32
155.7	35,000	12.50	1.23	333.5	75,000		22.47
160.0	36,000	13.93	1.38	338.0	76,000		23.66
164.5	37,000	15.50	1.53	342.5	77,000		24.91
169.0	38,000	17.20	1.70	347.0	78,000		26.22
173.5	39,000	19.06	1.89	351.5	79,000		27.58
178.0	40,000	21.08	2.08	356.0	80,000		28.99

*From AASHTO Interim Guide for Design of Pavement Structures, 1972, American Association of State Highway and Transportation Officials, Washington, D.C. 1974; Flexible Pavement.

Note: kN converted to lb are within 0.1 percent of lb shown.

ATTACHMENT A

Granite Construction Company

Page _____ of _____

MatCon® Inspection Report¹

No.: _____

Project Name: Taylor Lumber Superfund Site Number: _____

Location: Sheridan, Oregon Date Constructed: _____

Name of Inspector (s): _____ Position: _____

Date of Inspection: _____ Time: Start _____ Stop: _____

Weather Conditions: _____

Discussion: (Include purpose, scope, and any features or conditions specific to this inspection)

Information to be provided for each section of MatCon surface. Divide entire project into areas of different use, location, etc. and note or sketch them on attached site map. Note location of observed distress, attached photographs, or other features on the site map. Use additional sheets as needed.

Section No. Determine logically different areas based on use, location etc. and assign a number on the sitemap. Use GPS to define areas	<u>Site Use</u> Describe Current use of each section. Note any changes since last report	<u>Observed Distress²</u> 0. None 5. Rutting 1. Alligator Cracking 6. Raveling/Weathering/ 2. Block or Thermal Cracking Surface Blemish 3. Depression or Settlement 7. Hydrocarbon/Chemical Spill 4. Standing Water
		For each section indicate: <ul style="list-style-type: none"> ☞ Type of distress ☞ Locate distress on site map ☞ Provide GPS coordinates ☞ Attach Photo if appropriate ☞ Provide additional description / dimension
		GPS Location: Long.: _____ Lat.: _____ Alt.: _____ Observed Distress: _____ Dimension: Length: _____ Width: _____ Depth: _____
		Notes:

Page ___ of ___

¹ Submit report to Granite Construction Company.

² Refer to Operations and Maintenance Manual for information on distress.

Section No.	<u>Site Use</u>	<u>Observed Distress</u> ³
		GPS Location: Long. _____ Lat. _____ Alt. _____ Observed Distress: _____ Dimension: Length _____ Width _____ Depth: _____ Notes:
		GPS Location: Long. _____ Lat. _____ Alt. _____ Observed Distress: _____ Dimension: Length _____ Width _____ Depth: _____ Notes:

³ Refer to Operations and Maintenance Manual for information on distress.

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E Low Permeability Asphalt Cap Materials and Workmanship Warranty

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August 11, 2009

Karen Keeley
Remedial Project Manager
U.S. Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101

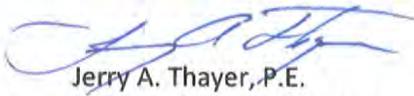
Re: Wilder Construction Company name change

Ms. Keeley,

Effective April 1, 2009, all of our operations merged into one operation as Granite Construction Company, a wholly owned subsidiary of Granite Construction Incorporated. All correspondence should be addressed to my attention, Granite Construction Company, 1525 East Marine View Drive, Everett, WA 98201.

Sincerely,

GRANITE CONSTRUCTION COMPANY



Jerry A. Thayer, P.E.

MatCon Program Manager

Date 5-19-08

6.10.08

ORIGINAL



RECEIVED

MAY 30 2008

Environmental Cleanup Office

MatCon® Material and Workmanship Warranty

Wilder Construction Company ("Wilder") hereby warrants MatCon® to be free from defects in material and workmanship on the terms stated below, if the MatCon surface is used and maintained with the operations and maintenance plan (cited below) attached herewith and incorporated as an integral part of this warranty.

EPA Prime Contract No. EP-R7-07-08, Installation of MatCon Cap at Taylor Lumber & Treating, Sheridan, Oregon

This warranty applies only to defects discovered within one year for workmanship and five years for material from the first day of the month following the completion of the original installation of MatCon, August 1, 2007. This warranty does not include damage to MatCon resulting from acts of God, including earthquakes, floods, tornadoes, hurricanes or force majeure. As used in this Warranty, "normal use" does not include: contact with harmful chemicals such as petroleum hydrocarbons (diesel and lubricating oils), unless they are cleaned up within 24 hours of discovery; or excessive point loading such as might occur if equipment is misused or heavy objects are dropped; abuse. This warranty is terminated if any alteration is made to the MatCon cap or its installation after Wilder completes the original installation, unless that alteration is approved by Wilder or performed by Wilder.

This warranty is only for the original purchaser, and is not transferable or assignable without expressed written request from Purchaser and written approval by Wilder. A warranty transfer may be pre-approved by Wilder in writing under separate cover prior to MatCon purchase or construction contract award. If Wilder provides a pre-approved warranty transfer, indicate by completing and acknowledging by signature the following information below:

Wilder/Representative Company Name: Wilder Construction Company
Wilder/Representative Company Address: 1525 East Marine View Drive, Everett, WA 98201-1927
Wilder Name/Title (print/type): Jerry A. Thayer, P.E.
Wilder (signature/date):
Purchaser Company Name: U.S. EPA Region X
Purchaser Name/Title (print/type): JAMES E. PRINE, CONTRACTING OFFICER
Purchaser (signature/date): James E. Prine 5/29/08

See last page

Written approvals for warranty transfer will not be unreasonably withheld. Purchaser agrees it purchased MatCon for commercial or industrial use, and not consumer use.

Wilder will have no obligation under this warranty regarding any defect unless Wilder receives from Purchaser written notice of that defect within one month after Purchaser first discovers that alleged defect, or sooner. Purchaser waives any warranty claim for any defect for which it does not give this notice to Wilder. Purchaser shall maintain and archive all reports related to visual inspections, surface use and operation reviews, surface cleaning records, and chemical spill reports for this warranty to remain in effect. Wilder will review these files in its evaluation and determination of defects that may be covered by this warranty. Any problems or defects noted during an inspection, an annual, informal or special inspection shall be documented in the inspection report and the report forwarded to Wilder within 10 working days of the inspection. This notification of potential warranty issues shall be considered acceptable warranty notification. Since many such problems or defects may be discovered during an inspection, an annual, informal or special inspection report that indicates a problem or defect that may be a potential warranty issue shall be considered acceptable warranty notification. Purchaser will give notice to:

Wilder Construction Company
1525 East Marine View Drive
Everett, WA 98201
Attn: MatCon Program Manager
Telephone: (425) 551-3100

Should defects covered by this warranty occur, Wilder's obligation would be limited to repair or replacement of the MatCon, at Wilder's option. Wilder, at the Purchaser's notification and request, will have the right to inspect, in consultation with Purchaser, to determine the cause of any alleged defect in the MatCon in addition to annual inspections during the life of this warranty for it to remain in effect. Wilder will determine warranty coverage of defects. All costs for inspections performed by Wilder outside of the annual inspection frequency provided with this warranty shall be at the Purchasers expense, unless such an inspection results in maintenance, repair or alterations covered by the warranty.

Definition of "Failure"

This warranty covers workmanship for the first year after construction, and materials for five (5) years. The warranty assumes that the recommended limitations of operation have not been compromised, although it is expected that under normal operation and routine maintenance, the MatCon cap will perform well for many years. For all defects covered by the warranty, Wilder will implement, direct, and/or subcontract all repairs for the warranty to be reinstated for the repaired areas for the remainder of the warranty period.

The most important performance parameter is permeability. The distress mechanisms that would compromise permeability are cracking and point source loading. The three most likely forms of cracking failure would be: (1) non-load associated (thermal tension) cracks; (2) load associated (fatigue) cracking due to abuse from sharp objects and repeated moving loads such as heavy trucks; and (3) subgrade failure (differential settlement).

This warranty explicitly applies to non-load associated cracking. Failures arising from load associated cracking and subgrade derived distress mechanisms are excluded from this warranty, unless specifically allowed below:

Non-Load Associated Failures Covered by this Warranty

Non-load associated thermal tension cracks will be repaired by routing and crack sealing. If cracking progresses extensively to the point of failure where permeability is compromised, additional maintenance or repair such as: 1) fog sealing; 2) localized overlay; or 3) removal, subgrade repair, and/or new MatCon pavement installation may be required. Non-load associated cracking that exceeds a cumulative total of 3000 linear feet per acre, including repaired cracks. When the linear distance of all cracks in an area exceed 3000 feet per acre, repair options alternative to routing and sealing should be considered.

Load Associated Failure Excluded from this Warranty

Load associated fatigue cracks are normally confined to areas where vehicle traffic is focused, such as an entrance to the site or aisles between storage units. If fatigue cracking occurs in the wheel paths, removal and replacement of the entire affected area (e.g., a 10-ft. wide driveway or small area damaged by point source load) would be required, following the recommended procedures for patching. Subgrade conditions that are also affected must also be repaired. Corrective action following repair would include review and modifications to surface use operations. Subgrade failure distress mechanisms (e.g., upheaval, settlement, etc.) that impact MatCon integrity must be mitigated and repaired prior to any MatCon replacement. Fatigue cracking, often appears as visible "alligator" cracking. Load associated failure is also defined when it occurs in over 5% of the area of traffic path, or when abuse or point source loading results in full depth or severe penetrations. Fatigue cracking is excluded from warranty if exceeds the limitations defined in the O&M Plan.

Load Associated Failure Included in this Warranty

Load associated fatigue cracks are covered if they occur within the warranty period as defined in the O&M Plan, and except as provided in the next sentence, are not related to underlying materials. Subgrade failure may be due to construction materials, construction methods, design error, subsurface conditions, underground utilities, weather related events, erosion, etc. and are not covered by Wilder's warranty.

Miscellaneous Failure Mechanisms Excluded from this Warranty

Failure can also be defined as a state of distress that compromises permeability and is beyond routine maintenance repairs that requires corrective fog sealing, patching, overlay, and/or subgrade repair. Other forms of distress such as; abrasion; chemical exposure; or material disintegration that can affect permeability are less obvious and are excluded from the warranty. Routine visual inspections and systematic reviews of surface operations, surface cleaning records, and chemical spill reports will need to be performed. This review is necessary to verify MatCon performance. Weathering noticed during the warranty term is covered by the warranty and is typically addressed by routine maintenance repairs.

Miscellaneous Failure Mechanisms Included in this Warranty

Any work, grinding or otherwise, performed by Baker Rock to correct "bird baths" as addressed in the February 5 and 6, 2008 Alternative Dispute Resolution meeting between EPA and Guardian Environmental Services Company will not void this warranty.

Limits of Liability

Wilder's liability under this warranty will in no event exceed the replacement cost of the material and installation sold to the Purchaser for the localized area of the MatCon in which it failed. Further, under no circumstances will Wilder be liable for any special, direct, indirect, or consequential damages arising from loss of production or any other losses including losses due to personal injuries and product liability owing to the failure of the material or installation and no allowance will be made for repairs, replacements, or alterations made by the Purchaser without the express written consent of Wilder.

No changes may be made to this warranty or the O&M Plan as attached and incorporated by reference into this warranty, except by a written document signed by an officer of Wilder.

Purchaser shall have no warranty claims for any operational use changes, repairs, alterations, replacement or modifications made to any MatCon surfaces or material without expressed prior written authorization from Wilder. Such authorization shall not be unduly withheld, provided they are consistent with the warranty and O&M Plan, and Purchaser has demonstrated historical compliance with the O&M Plan.

This warranty and the remedies provided herein, are Purchaser's exclusive rights against Wilder.

WILDER MAKES NO WARRANTY OF ANY KIND OTHER THAN THAT GIVEN ABOVE AND HEREBY DISCLAIMS ALL WARRANTIES, BOTH EXPRESSED OR IMPLIED, OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Warranty effective date: August 1, 2007

WILDER CONSTRUCTION COMPANY

PURCHASER: U.S. EPA Region 10
(name)

By:  131M, 08

By: Jerry A. Thaver

Its: MatCon Program Manager

By: 
(signature)

By: JAMES E. PRICE
(print/type name)

Its: Contracting Officer
(title)

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F Groundwater Extraction System Operation and Maintenance Plan

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ecology and environment, inc.

International Specialists in the Environment

1500 First Interstate Center, 999 Third Avenue
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

November 6, 2000

Ms. Beth Sheldrake, Deputy Project Officer
United States Environmental Protection Agency
1200 Sixth Avenue, M/S ECL-116
Seattle, Washington 98101

RE: Contract No. 68-W6-0010
TDD: 09-00-09-0015

Dear Ms. Sheldrake:

Enclosed please find the START's draft Groundwater Extraction System Operation and Maintenance Plan for the Taylor Lumber and Treating site, located in Sheridan, Oregon.

If you have any questions or comments, please contact me at (206) 624-9537.

Sincerely,

Jeff Fowlow
START Project Leader

Enclosures

cc: Mike Sibley, On-Scene Coordinator, EPA, Seattle, WA, ECL-116
Carl Kitz, On-Scene Coordinator, EPA, Seattle, WA, ECL-116
David Byers, E & E START Program Manager, Seattle, WA (letter only)
Roger Culleton, E & E START Project Manager, Seattle, WA

**Taylor Lumber and Treating Site
Groundwater Extraction System
Operation and Maintenance Requirements
TDD No.: 09-00-09-0015**

1 Introduction

- 1.1 In order to control the groundwater elevation within the boundaries of the barrier wall, a groundwater extraction system was installed. The groundwater extraction system is designed to keep the groundwater elevation at or below 3-feet below ground surface (bgs).
- 1.2 In order to maintain the desired groundwater elevation, 4 extraction wells (PW-1, PW-2, PW-3, and PW-4) were installed. Due to site geology, the wells will only sustain a low flow rate. Therefore, a low flow, air driven, pneumatic pump was installed in each well.
- 1.3 The effluent from wells PW-1 and PW-2 are pumped into a holding tank located next to the southwest corner of the boiler building. The effluent from well PW-3 is pumped into a sump pit located at the east end of the tank farm building. The effluent from well PW-4 is pumped into a sump pit located on the north side of the drip pad near the southwest corner of the creosote unloading building. Each pump's effluent is eventually pumped into an existing evaporator system located at the treatment facility. Please refer to Figure 1 (attached) for the location of each well, associated air supply and effluent piping, and effluent discharge points.
- 1.4 The pumps will need to be operated continuously, therefore, it is imperative that a regular operation and maintenance (O&M) plan be implemented as soon as the groundwater extraction system is operational.
- 1.5 The following is the recommended O&M plan for the extraction system.

2 Pneumatic Pumps

- 2.1 The pneumatic pumps chosen for the groundwater extraction system are manufactured by QED Environmental Systems, Inc. The Standard Solo II model pneumatic pump was used and can pump up to 5 gallons of water per minute (gpm). Please refer to Appendix A for a complete list of pump specifications.
- 2.2 The air supply for the pneumatic pumps is provided by Taylor Lumber and Treating, Inc. (TLT). Therefore, TLT is responsible for the uninterrupted supply of air to the pumps at the manufacturer's recommended pressure ranges (see Appendix A).
- 2.3 The pneumatic pump will expel 0.53 gallons of water during each pump cycle, with a pump cycle defined as the amount of time it takes for the pump chamber to fill with water, trigger the float switch, and expel the volume of water with air pressure. In order to determine a flow rate for each pump, one needs to record the length of time between

**Taylor Lumber and Treating Site
Groundwater Extraction System
Operation and Maintenance Requirements
TDD No.: 09-00-09-0015**

each pumping cycle. As an example, if a pump cycled 10 times during one minute, the flow rate would equal:

$$(10 \times 0.53 \text{ gallons}) / 1 \text{ minute} = 5.3 \text{ gpm}$$

2.3.1 On October 28, 2000, the following flow rates were observed:

PW-1 = 0.27 gpm;

PW-2 = 1.13 gpm;

PW-3 = 0.16 gpm; and

PW-4 = 0.07 gpm.

2.4 **Weekly Maintenance:** In order to ensure that the pumps are functioning properly, TLT personnel shall perform the following inspections at intervals not to exceed one week (7 calendar days):

2.4.1 Visually inspect each well vault and ensure that all piping is intact and is not leaking. If any piping is leaking, the pump should be shut off and the piping repaired immediately.

2.4.2 Visually confirm that water is being pumped through the effluent lines. For wells PW-1 and PW-2, a hose will have to be attached to the ball valve and the effluent pumped into a container. Since wells PW-3 and PW-4 each discharge into a sump pit (see Figure 1, attached), verification can be achieved by witnessing the effluent discharge. If a pump is not functioning, trouble shoot the problem and repair the pump as soon as possible.

2.4.3 Record the air pressure setting for each pump. The air pressure should be set between 65 and 70 pounds per square inch.

2.4.4 Record the time required for three (3) pump cycles and calculate the flow rate as described in paragraph 2.3 above.

2.4.5 A record of each weekly inspection must be recorded and filed on site. The record shall include the following:

1. The time and date of each inspection;
2. The name of the individual performing the inspection;
3. The time required for an individual pump to go through three pumping cycles;
4. Calculations of flow rate for each pump;
5. Air Pressure at the well head;
6. Brief description of any leaks found in air or water piping;
7. Brief description of repairs made to air or water piping;

**Taylor Lumber and Treating Site
Groundwater Extraction System
Operation and Maintenance Requirements
TDD No.: 09-00-09-0015**

8. Brief description of problems with a pump;
9. Brief description of repairs made to pump;
10. The time and date any required repairs were performed;
11. The name of the individual(s) performing required repairs;
12. The time and date of the inspection and final approval of required repairs; and
13. The name of the individual who inspected and approved the repairs.

2.4.6 The weekly inspection record shall be made available to the United States Environmental Protection Agency (EPA), or EPA's authorized representatives, upon request.

APPENDIX A

Pneumatic Pump Specifications

Solo II Automatic Cleanup Pumps



The best-selling automatic pump is now even better—with improved performance, lower prices, and a 2-year warranty.

QED's introduction of the Solo® pump in 1990 changed cleanup pumping. Thousands are now in use at landfills, hydrocarbon recovery sites, and cleanup projects across the U.S., Canada, Mexico, and overseas.

Why? They don't need the external controllers, timers, or downwell probes used to regulate duty cycles of ordinary electric or pneumatic pumps.

QED engineers have continuously improved their design, materials, and capabilities. New-generation Solo(r) II pumps are the industry workhorse for moderate-flow, 4" well applications.

More efficient and reliable

Every pump constantly reacts to changes in well yield, pumping up to 5 GPM (7,200 GPD) or shutting down if the well level drops. This increases efficiency and reduces air usage.

Explosion-proof, automatic air-driven pumps are far more suited for many tough landfill and cleanup applications than electric submersibles. There's no damage from running dry (because they can't!); no overheating; no shock hazard; no seals or impellers prone to damage by solids and solvents; and a much wider duty cycle than narrow-range electric pumps.

High-clearance, self-cleaning ball check valves and proven, chemical-resistant materials deliver dependable operation without clogging or breakdowns. All parts are rated for millions of cycles and are easily field-replaceable; there's no downtime while you send pumps out for repairs.

How are Solo II pumps better?

Specially-cured epoxy floats withstand higher temperatures and a wider range of aggressive fluids without saturation. New air control valves improve startup, even after extended system shutdowns.

Solo II Pump Advantages

Guaranteed durability, with stainless steel body and two-year warranty standard.

High-clearance flow path resists clogging by sediments or viscous liquids.

Reduced maintenance and downtime with quick, easy disassembly and field replaceable components.

Materials and fittings have been changed to make pumps easier to use and maintain. QED is so sure of Solo II pump reliability, we've made the warranty two years, at least double the competition's.

Widespread success with users allows us to pass on manufacturing savings in the form of lower prices-making Solo II pumps the best value in remediation pumping.

Controllerless operation

Each Solo II pump (U.S. Patent No. 5,141,404) runs itself, with an internal float system and a magnetic air control valve. The float follows changing liquid levels in the pump, signaling the valve to turn the air on as soon as the pump is full and off when empty.

The air control mechanism uses a magnetic relay to isolate it from pumped fluids. QED has engineered it into a compact cartridge that can be easily accessed without disassembling the entire pump. If you've ever struggled to take apart one of the competition's automatic pumps, you know what a huge advantage this is.

Solo II systems are easier to install, with no air cycle or on/off level controllers at the wellhead, no electrical connections or pneumatic logic lines. Startup and operation are simple.

Wide range of applications

With two pump sizes and three inlet choices, the Solo II system can be custom-tailored to meet a broad spectrum of pumping needs. Self-optimizing Solo II pumps are far more reliable than electric pumps in demanding moderate flow applications with fluctuating on/off cycles.

The leachate inlet screen provides protection against solids that would clog other pumps. Short-body pumps provide drawdown to only 12" of liquid in the well. There's no danger of over-driving or foaming of the pumped liquid.

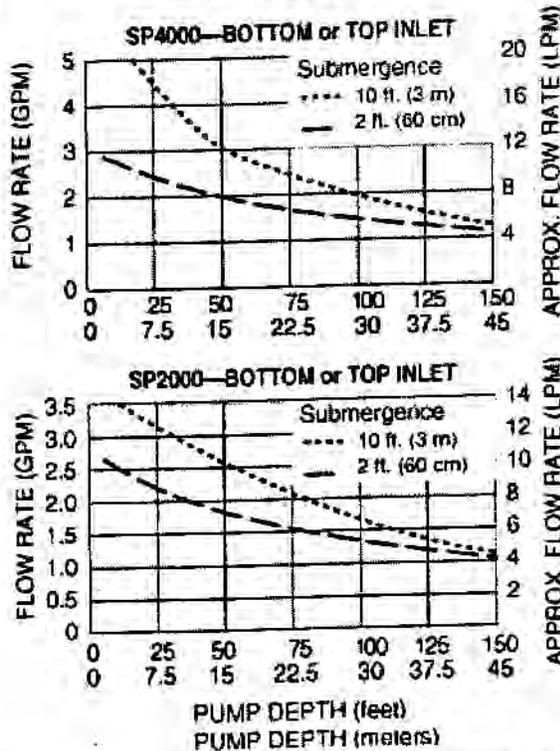
The standard pump/bottom inlet screen combination works best in general cleanup applications. With the top inlet, floating hydrocarbons can be skimmed along with contaminated ground water.

For higher flow rates, or controllerless pumping from 2" wells, see QED's HammerHead(tm) pumps.

Ideal for wells under pressure or vacuum

With control located right in the Solo II pump, performance is not affected by vacuum or pressure changes in the well. This makes it the choice for moderate-flow liquid removal in soil vapor extraction or dual cleanup well systems; condensate removal in landfill gas wells or risers; and landfill leachate pumping.

SOLO II FLOW CURVES



SOLO II PUMP SPECIFICATIONS

	SHORT BODY SOLO II PUMP	STANDARD SOLO II PUMP
Model No.	SP2000	SP4000
Pump Type	Automatic Positive Air Displacement	Automatic Positive Air Displacement
Inlet	Bottom*	Bottom*
O.D. in.(cm)	3 in (7.5 cm)	3 in (7.5 cm)
Length	28 in (71 cm)	48 in (122 cm)

Weight		9 lbs. (4 kg)	14 lbs. (6.5 kg)
Materials		Stainless steel, Teflon(r), Q-Tal, epoxy, Viton O-rings	Stainless steel, Teflon(r), Q-Tal, epoxy, Viton O-rings
Fittings:	Type	Barb	Barb
	Materials	Brass (Stainless steel available)	Brass (Stainless steel available)
Sizes: in(mm)	Liquid Discharge	3/4 in (19 mm)	3/4 in (19 mm)
	Air Supply	3/8 in (9mm)	3/8 in (9mm)
	Exhaust	1/2 in (13 mm)	1/2 in (13 mm)
	Brain Exhaust	1/4 in (6 mm)	1/4(6)
Pump Stroke		.095 gal. (360 ml.)	.53 gal. (2000 ml.)
Operating Pressure		40-100 psi (275-700 kPa)	40-100 psi (275-700 kPa)
Maximum Lift		200' (60 m)	200' (60 m)
Maximum Flow Rate		3.5 GPM (13 LPM)	5 GPM (19 LPM)
Minimum Submergence		12" (30 cm)	42" (107 cm)
Density of Pumped Liquid		0.7 g/cc up	0.7 g/cc up
Cap Sizes		4", 6", and 8" (100, 150, & 200 mm)	4", 6", and 8" (100, 150, & 200 mm)

*Top inlet adapters and protective high solids/leachate inlet screens available.

Need Help?
Call 1-800-624-2026

E-Mail Data Collection
Form

Product
Specifications

Rental
Information



**Taylor Lumber and Treating
Removal Action Report
Sheridan, Oregon**

TDD: 09-00-09-0015

Contract: 68-W6-0010
January 2001

Region 10

START

Superfund Technical Assessment and Response Team

Ecology and Environment

Submitted To: Michael Sibley, On-Scene Coordinator
U.S. Environmental Protection Agency
1200 Sixth Avenue
Seattle, WA 98101

backfill mix design using soil from the off-site location shall be developed by the barrier wall contractor before construction to achieve required permeability; and

- **Protective Cap.** A protective cap is to be installed over the top of the barrier wall to protect the wall from loads being applied by heavy equipment traffic. Based on the maximum load of TLT, Inc.'s, largest piece of equipment, a cap with a minimum depth of 30 inches and width of 9 feet was required to protect the barrier wall from the load. The base and walls of the cap trench will be covered with a low permeable (4×10^{-12} cm/s) geosynthetic clay liner (GCL), which will be overlain by a subgrade stabilization geotextile, which in turn will be overlain by at least 30 inches of compacted base aggregate.

3.3.2.2.2 Asphalt Concrete Cap

An AC cap was designed to cover the area enclosed by the slurry wall to minimize infiltration of storm water. Oregon Department of Transportation (ODOT) Standard Specifications 00730, 00754, and 00747 were followed during the design. Following is a brief description of the design criteria used to develop the detailed design drawings and technical specifications for the AC cap:

- **Grading.** All areas to be paved are to be graded to slope toward existing storm water conveyance systems. Existing contours of the site are to be used as much as possible to reduce cut/fill requirements;
- **Mix Design.** The AC mixes for the pavement base course and wearing course will be designed in accordance with ODOT Standard Specification 00747; and
- **Thickness.** Based on the expected loads at the site, a 2-inch-thick base course and a 2-inch-thick wearing course will be installed.

3.3.2.2.3 Groundwater Extraction System

As mentioned in Subsection 3.2.3, four groundwater extraction wells are to be installed within the barrier wall to induce an inward hydraulic gradient and to prevent the water level at the upgradient boundary from rising above the protective cap. The flow rate at each well is expected to be approximately 75 cubic feet per day. Extracted groundwater will be pumped into TLT, Inc.'s, existing wastewater treatment system. Following is a brief description of the design criteria used to develop the detailed design drawings and technical specifications for the groundwater extraction system:

- **Pump.** Because of very low flow rates from each extraction well, an automatic pneumatic pump will be selected for each well. In addition, TLT, Inc., has an existing supply of compressed air that can be used to operate the pneumatic pumps. The maximum required head for each pump is estimated to be 60 feet. A pump that has a lift

capacity of 150 feet, that has a maximum flow rate of 5 gallons per minute (gpm), and that operates with an air supply ranging from 40 to 100 pounds per square inch will be specified for each well;

- **Piping.** The layouts of groundwater discharge pipes and air supply pipes will be designed to select the shortest straight route to the closest wastewater receiving tanks or sumps and air supply outlets at the TLT site. All piping is to be installed under ground to prevent the pipe from freezing and accidental damage by traffic. The minimum buried depth is 24 inches as recommended by the ODOT. High-density polyethylene (HDPE) pipe with a 0.75-inch inside diameter will be selected for water discharge and air supply lines. The pipe size will be selected by balancing factors such as minimum/maximum flow, pressure, and friction loss. The pipe size for the water line is to be reduced to 0.5 inch when it runs from under ground to above ground to increase the fluid velocity and to reduce the chance of freezing; and
- **Valves.** The desired flow rate is to be achieved by adjusting a throttle valve. A globe valve to throttle the flow rate, a three-way ball valve for sample collection, and an in-line ball check valve to stop reverse flow will be required in each water line at each extraction wellhead. All valves are made of polyvinyl chloride (PVC). For the air supply line, a shut-off valve is to be provided by TLT, Inc., for each air supply outlet.

3.3.2.3 Soil-Bentonite Barrier Wall Construction

The barrier wall construction work is broken into several subtasks. Installation of the groundwater extraction system water and air piping is to be completed by EQM, installation of the soil-bentonite barrier wall is to be completed by an EQM subcontractor that specializes in barrier wall construction, subgrade preparation of the pavement area is to be completed by EQM, installation of AC pavement is to be completed by an EQM paving subcontractor, and installation of groundwater extraction wells is to be completed by an EQM drilling subcontractor. Demolition of existing rails east of the retorts and north of the creosote unloading building is to be completed by the TLT, Inc., contractor. A photographic log for this field event is found in Appendix K.

The bidding documents for the soil-bentonite barrier wall construction were issued by EQM to three interested bidders on July 21, 2000. On July 25, 2000, a responsive low bidder, Environmental Reclamation, Inc. (ERI), was awarded the contract. According to the technical specifications, ERI submitted a construction operation plan and schedule on August 7, 2000, for review and approval. The START reviewed the submittals, and found that, in many places, the proposed technical measures and schedule did not meet the requirements of the technical specifications. The START conveyed its concern to the EPA regarding ERI's ability to perform the work. In the meantime, the START continued to review additional ERI submittals. After several rounds of submittal review and revisions, the EPA determined that ERI could not meet the technical and time requirements and requested that EQM

terminate the contract with ERI. On August 18, 2000, EQM awarded the contract to the second lowest responsive bidder, Geo-Con. Geo-Con submitted a construction operation plan and schedule on August 22, 2000. The START reviewed and approved the submittal as noted with comments on August 23, 2000.

Geo-Con performed a preconstruction soil-bentonite backfill mix test to find the correct percentage of bentonite and soil in the backfill material to achieve the required permeability of 1×10^{-7} cm/s. Once the mix test was completed and approved, Geo-Con mobilized to the site on September 5, 2000.

Following is a list of major construction activities that occurred from August 16 through October 31, 2000. Paving activities at the northwest corner of the treated pole storage area are discussed in Subsection 3.3.2.1 and, therefore, are not included below. Soil cell construction occurred during this period and is discussed in Subsection 3.3.3.

- 08/16/2000-08/25/2000: EQM installed groundwater extraction system water and air pipes.
- 09/05/2000-09/09/2000: Geo-Con located and protected underground utilities and pipes.
- 09/10/2000-09/25/2000: Geo-Con completed the excavation and backfill operations for the slurry trench.
- 09/27/2000-10/09/2000: Geo-Con completed installation of the barrier wall protective cap and demobilized on 10/09/00.
- 10/10/2000-10/16/2000: EQM completed subgrade preparation of the AC pavement area.
- 10/17/2000-10/31/2000: Paving subcontractor completed AC pavement.
- 10/23/2000-10/26/2000: Drilling subcontractor completed installation of groundwater extraction wells. EQM completed installation of well pumps.

3.3.2.3.1 Construction Management and Administration

The parties on site during construction activities from August through October 2000 included the EPA; the START; EQM; the United States Coast Guard (USCG); TLT, Inc.; MFA (TLT, Inc.'s contractor); and EQM subcontractors. The START's major responsibility was to provide technical assistance and administration to the EPA for the duration of the construction activities. Construction cost monitoring and subcontract administration were the responsibility of EQM. The USCG was responsible for producing weekly Pollution Reports, oversight of health safety, and acting as the EPA OSC's designee in the OSC's absence. MFA represented TLT, Inc., and acted as TLT, Inc.'s observer during

construction activities. The START and EQM reported directly to the EPA, which ultimately was responsible for the RA. All EQM subcontractors reported directly to EQM. In many circumstances, the EPA authorized the START to communicate directly with EQM to facilitate problem solving. The START always communicated through EQM for questions regarding EQM's subcontractors.

The START used computer software, Super Prolog Plus, Version 3, to log all contractor submittals and engineer reviews of the submittals. A detailed submittal log is included in Appendix E. Daily activities were documented in logbooks and in general daily notes reports, which are included in Appendix F. After barrier wall construction began on September 5, 2000, daily meetings were conducted with all on-site parties in TLT, Inc.'s, treatment plant office. The purpose of the daily meetings was to discuss and solve issues, review planned future work, and identify and plan solutions to potential problems. Meeting minutes were prepared by the START and are included in Appendix G.

3.3.2.3.2 Groundwater Extraction System Water and Air Pipe Installation

The groundwater discharge and air supply pipes were installed in the same trench for each well. Minor adjustments were made to the original piping layout after the START discussed the final locations of each well's discharge point and air supply location with TLT, Inc. Groundwater extracted from well Nos. PW-1 and PW-2 is discharged to a wastewater tank located at the southwest corner of the boiler room, groundwater extracted from well No. PW-3 is discharged to a sump located in the P-9 oil tank farm, and groundwater extracted from well No. PW-4 is discharged to a sump near the southwest corner of the creosote unloading building and next to the north side of the drip pad (Figure 3-9). Each groundwater extraction well's discharge ultimately is pumped into existing wastewater tanks, located in the P-9 oil tank farm, and treated in the existing wastewater evaporator. The final location of all groundwater extraction wells and associated piping will be included in the record drawings being developed by EQM.

Trench excavation, pipe installation, and backfilling were performed in accordance with the detailed design drawings and technical specifications. Small amounts of storm water/groundwater were encountered during trench excavation for well Nos. PW-1 and PW-4. EQM promptly dewatered the trenches. All wastewater collected during dewatering activities was disposed of in TLT, Inc.'s, existing wastewater treatment system located at the treatment plant. All excavated soil from the trenches was unsuitable for backfill; therefore, clean base aggregate was used as backfill. The backfill was placed in 8-inch layers and compacted to 95% of its maximum dry density. All pipes passed the pressure tests in accordance with the technical specifications.

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permanently to prevent asphalt damage. Two storm water drainage ditches (one immediately south of the treatment facility shop and draining from north to south, and the other at the south end of the site and draining from west to east) were excavated, backfilled with crushed stone, and paved. The EPA notified TLT, Inc., that the drainage ditches are not to be driven in for any reason after pavement. A concrete oil/water separator in the ditch draining from west to east was demolished, and the area was backfilled with crushed stone.

After the subgrade work was completed, the paving subcontractor, Rowell & Wickersham Contractors, Inc., performed final grading before placement of AC pavement. The installation of all AC pavement was completed on October 31, 2000.

3.3.2.3.7 Groundwater Extraction Well Installation

The groundwater extraction wells were installed by Geotech Explorations, Inc., a subcontractor to EQM. Each well is 6 inches in diameter. Each well has 5 feet of well screen, except well No. PW-1, which has a 3-foot screen because of the proximity of the siltstone to the ground surface. Well No. PW-1 was completed to 11.5 feet bgs, well No. PW-2 was completed to 12.4 feet bgs, well No. PW-3 was completed to 15.8 feet bgs, and well No. PW-4 was completed to 17.5 feet bgs. Detailed well logs are included in Appendix H.

After the wells were installed and developed, well vaults were installed. Once the well vaults were installed, EQM installed a pneumatic pump in each well. The pumps were installed 6 inches above the bottom of the well. The pumps are bottom-filling; therefore, they will pump continuously for as long as water fills the pump body. On October 28, 2000, the START recorded a flow rate of 0.27 gpm for well No. PW-1, 1.13 gpm for well No. PW-2, 0.16 gpm for well No. PW-3, and 0.07 gpm for well No. PW-4.

3.3.3 Soil Cell Construction

As discussed in Subsection 3.1.2, on-site containment was selected by the EPA as an interim step to manage the contaminated soil generated during RA activities. In addition to the stockpiled soil mentioned in Subsection 3.1.2, the cells also contain contaminated soils from the barrier wall trench; spoils from demolition of the TLT, Inc., retort and creosote unloading tracks; spoils from the barrier wall cap installation; the tree bark pile south of the treatment facility shop; and excavated soil from soft spots.

Three soil cells were constructed in the existing waste pile area located in the far northwest portion of the west facility (Figure 3-10). Cell Nos. 1 and 2 were constructed from July 20 to

**G Stormwater Treatment System Evaluation
(includes NPDES Permit)**

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Stormwater Treatment System Evaluation, Taylor Lumber and Treating Superfund Site

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Gary Hickman
COPIES: Robin Strauss
DATE: June 14, 2006
PROJECT NUMBER: 342790.PD.01

1. Introduction

Construction of the stormwater treatment system (SWTS) at the Taylor Lumber and Treating Superfund Site (TLT) in Sheridan, Oregon was completed in August 2000. Design documentation for the SWTS is available (MFA, June 2000); however, construction of the system was completed shortly before TLT filed bankruptcy and as-built documentation is incomplete. A limited set of drawings was provided with a Draft Operations and Maintenance (O&M) manual (MFA, August 2000), but the drawings were not stamped by the design engineer and no documentation regarding changes to the design was included. Discussions with the current operators, Pacific Wood Preserving of Oregon (PWPO), have established that a number of features of the SWTS differ significantly from the original design.

Proposed EPA Superfund remedial activities at TLT involve expanding the proportion of paved surfaces in the Treatment Plant and Treated Pole Storage Areas. This would result in increased stormwater runoff flow to the SWTS, increasing the hydraulic loading and reducing the residence time in treatment process vessels. In addition, influent concentrations of total suspended solids (TSS) may decrease, whereas influent concentrations of oil and grease may increase. These potential changes are discussed in more detail in Section 5 of this document. If the existing system is not capable of handling these changes, then modifications either to the SWTS or to the proposed remedial alternative will be necessary.

An evaluation of the SWTS was conducted to assess the potential impact on the SWTS of the anticipated changes in stormwater flow and characteristics. The specific objectives of the SWTS evaluation were as follows:

- Review PWPO's operational data and observations since January 1, 2005. The 2005 calendar year was selected as the basis of the analysis, since this was most recent complete year of operating data and was expected to be most representative of current system performance.

- Visit the site to document and confirm installed equipment and discuss system operation. Photos from the site visit are included in Attachment E.
- Evaluate system performance of the existing system configuration under the current surface conditions.
- Evaluate the ability of the existing SWTS to handle the impacts of increased pavement on expected flows and water quality into the system.

2. Current Conditions

2.1 Influent Streams

PWPO currently operates the SWTS under National Pollutant Discharge Elimination System (NPDES) waste discharge permit #101267, expiration November 30, 2009 (included as Attachment B). The NPDES permit allows for the treatment of three types of wastewater sources by the system:

- Stormwater runoff
- Extracted groundwater
- Boiler blowdown

The SWTS influent consists of a mixture of these waste streams, with stormwater runoff making up the vast majority of the total. The stormwater runoff rates, described in the following section, indicate that stormwater constituted at least 96.4 to 99.7 percent of the SWTS flow during average and maximum daily flow conditions in 2005. Boiler blowdown is discharged to the SWTS only when the SWTS is actively treating stormwater to prevent discharge of high temperature effluent. The maximum flow rate of boiler blowdown is estimated at about 1200 gpd and the rate of extracted groundwater is approximately 360 gpd (ODEQ, November 2004). This groundwater extraction rate represents the maximum flow observed over the year based on weekly pump cycle measurements.

PWPO has stated that no part of the wood treating process stream is discharged to the SWTS, but will be briefly discussed here for completeness since a portion of the SWTS effluent is used to formulate the treatment process water. PWPO uses two solutions in their wood treating processes: a water-based solution and a diesel-based solution. These products are stored in separate tanks but are applied to the lumber under elevated temperature and pressure in the same retorts. Residual product is collected and routed through a separation system to reclaim the diesel- and water-based products for subsequent reuse. Additional make-up water, diesel, and treating chemicals are added to the respective supply tanks as needed. In this way, the use of treatment products is complete, and there is no process waste stream. PWPO uses water discharged from the SWTS to make-up the process water for the water-based treatment product. The process water is not a permitted wastewater source to the SWTS.

2.2 SWTS Influent Characteristics

Flow

Daily SWTS operating records were obtained from PWPO for the period of January 1, 2005 through February 28, 2006, and are included in Attachment A. Documented parameters included:

- Daily cumulative flow [thousands of gallons] – measured on the discharge side of the primary transfer pump
- Daily rainfall [inches] – measured at gauge mounted on wet well
- Daily water level [feet] in the storage tank
- Daily inspection checklists

The flow, rainfall, and water level data are displayed graphically on Figures 1 to 3. Some key observations for 2005 include (2006 data excluded):

- Total annual rainfall = 46.17 inches per year
- Total annual flow = 15.8 million gallons
- Average daily flow = 43,300 gallons per day
- Maximum daily flow = 457,000 gallons per day on 1/18/05
- Maximum height in storage tank = 23.3 feet on 12/28/05 (out of a possible 24 feet before overflow/SWTS bypass occurs)

It is important to note that the flows reported above were measured through the primary transfer pump only. The flow through the secondary transfer pump is not measured. Therefore, the actual flow through the system was higher. It was estimated that the flow through the secondary transfer pump was about 5 percent of the total flow of 15.8 million gallons measured through the primary transfer pump in 2005 (refer to Section 4.2 for details).

Figure 1 indicates that the cumulative rainfall and flow through the system are proportional with approximately 356,000 gallons of flow resulting per inch of rainfall. This relationship neglects the relatively small overall contribution of the secondary transfer pump.

Characteristics

No information was available regarding the SWTS influent water quality characteristics. The original design specified a turbidity meter to be installed in-line after the storage tank; however, the meter was not included with the as-built system.

Expected constituents in the SWTS influent include:

- TSS (as a result of soil fines and dust entrained in the stormwater runoff)
- Dissolved metals (from drippage from treated lumber in stormwater runoff and from boiler blowdown, e.g., copper, zinc, and arsenic)
- Pentachlorophenol (from extracted groundwater)
- Oil and grease (from vehicle drippage in stormwater runoff and from boiler blowdown)

2.3 Stormwater Drainage Area and Model

Stormwater runoff is collected from three contiguous drainage areas comprising the majority of the Treatment Plant and Treated Pole Storage Areas (a figure of the drainage areas is included in Attachment C). These drainage areas were established in the Phase 1 & Phase 2 Report (MFA, June 2000) and comprise a total area of 21.2 acres, extending west about 850 feet from the fence along Rock Creek Road, and south from the Willamette Pacific Railroad to within about 125 feet of the West Valley Highway. A strip of approximately 2.6 acres along the southern portion of the Treatment Plant area, adjacent to the West Valley

Highway, is the only portion of land within the Treated Pole Storage and Treatment Plant areas that does not drain to the SWTS.

The drainage area currently contains about 8.1 acres of asphalt/concrete pavement consisting of:

- The asphalt cap over the area contained within the barrier wall (4.6 acres).
- The asphalt cap over the contaminated soil in the Treated Pole Storage Area (2.0 acres).
- Other miscellaneous asphalt/concrete surfaces (approximately 1.5 acres).

Stormwater runoff north of the barrier wall cap is collected in the French drains that run along the north and east boundaries of the drainage area. From the northern edge of the barrier wall cap south, stormwater runoff is collected by a series of stormwater catch basins. The French drains, catch basins, and associated piping make up the conveyance system to the SWTS. Figures showing the locations of currently paved areas and the conveyance system are included in Attachment C.

Stormwater that is not captured by the conveyance system, either infiltrates into the soil or evaporates back into the atmosphere. A small portion of the runoff can also infiltrate into the asphalt/concrete surfaces. Water drained from the roofs of the buildings is conveyed to ditches outside of the drainage area and is not treated by the SWTS. For the purposes of this analysis, infiltration into the paved surfaces, evaporation, and roof drainage are considered to be negligible in the overall water balance within the drainage area.

The overall drainage area consists of a combination of essentially impervious (asphalt/concrete) and partially pervious (soil/gravel) surfaces. Based on the proportional response observed between the influent flow and amount of rainfall (356,000 gallons/inch), the combination of surfaces acts effectively as an impervious area of 13.1 acres (see Attachment C for calculations). Since the actual size of the drainage area is 21.2 acres, the capture efficiency of the drainage area as a whole is about 62 percent. In other words, approximately 38 percent of stormwater infiltrates into the unpaved areas and is not captured by the SWTS. The capture efficiency of the unpaved portion of the drainage area can be calculated as about 38 percent (note that this is coincidentally the same as the previous figure), assuming 100 percent capture efficiency in the paved areas.

3. SWTS Configuration

On April 3, 2006, CH2M HILL conducted a site inspection of the SWTS with the aid of Sheldon Stewart of PWPO (the SWTS operator). The objective of the inspection was to document the existing system configuration and note any significant differences from the design and O&M documentation. Attachment D includes a marked up Process and Instrument Diagram from the Phase 1 & Phase 2 report and associated notes.

The existing SWTS consists of the following features (with significant differences from the design and O&M documentation as noted):

- **Conveyance System.** Collects stormwater using a series of French drains and catch basins from the drainage area and transports it to the oil-water separators at the southeastern corner of the Treatment Plant. The boiler blowdown and extracted groundwater are injected into a catch basin slightly upstream of the oil-water separators.

The French drains are not shown on the design or O&M drawings. A 4-inch PVC cleanout was identified at the northeast corner of the facility, which is believed to be for the French drains. Attempts to trace the French drain lines were unsuccessful, probably because the PVC drains were installed without a tracer wire. The upcoming Design Basis Report will incorporate the relevant SWTS conveyance features on a map of utilities. The approximate locations of the French drains will be noted.

- **Oil-Water Separation and Wet Well System.** Combined influent from all three wastewater sources passes through two oil-water separators operated in parallel. The oil-water separators are below-grade vessels containing coalescing plates and overflow and underflow baffles. The oil-water separators are intended to remove light and dense petroleum based products to avoid fouling in subsequent unit processes and possibly leaving the site. Other materials are likely also removed, such as dense sediment and floating particles such as wood. Oil-water separator effluent flows by gravity to the wet well. The wet well houses two float-activated centrifugal pumps, which turn on and off automatically based on water level. The smaller of two pumps is the primary pump to transfer water from the wet well to the storage tank. The larger secondary pump runs in combination with the primary pump if the wet well level reaches the second float "on level". This differs from the design drawing which shows three pumps. Residuals are vacuumed from the oil-water separators on an approximately annual basis.
- **Storage System.** Water is pumped from the wet well to the storage tank, which provides storage for flow equalization to the rest of the SWTS. The storage tank is an aboveground, 500,000 gallon, bolted-steel, open-top tank, with a visible level gauge mounted to its side. If the water level in the tank reaches 24 feet, water begins to flow through a bypass to the outfall without treatment.
- **Transfer System.** The transfer system consists of two pumps and associated instrumentation, controls, and piping. The two transfer pumps are plumbed to draw water from near the bottom of the storage tank and convey it to the sedimentation system. The primary pump is reported to deliver a flow of approximately 600 gallon per minute (gpm). The secondary pump, which is reported to deliver approximately 1200 gpm, starts when the water level in the storage tank reaches 19 feet, for a combined flow of 1800 gpm. A flow meter installed on the discharge side of the primary pump measures the flow of water through the primary pump only. The flow through the secondary pump, when operating, is not measured. This differs from the design drawing which shows a flow meter that measures the combined flows from the primary and secondary pumps. A polymer precipitant is added before the transfer pumps, and prior to entering the rapid-mix tank a coagulant is added to further condition the suspended solids. The transfer pumps are larger than were noted in the design and O&M drawings. Also the design drawings specified a turbidity meter in-line along with the flow meter, which is not installed.
- **Sedimentation System.** Consists of a chemical storage shed containing four chemical tanks and metering pumps, two mix tanks with mechanical mixers, four cone-bottom sedimentation tanks, and a sludge handling system (pump and plate-and-frame filter press). It is designed to precipitate dissolved metals and remove suspended solids prior to the filters and granular activated carbon (GAC) beds. In the first tank (rapid-mix), a sodium hydroxide solution is added to raise the pH to approximately 8.4. In the second

tank (slow-mix), a polymer is added to flocculate the solids. Water then flows into the four sedimentation tanks where the floc is allowed to settle out. The combined volume of the four sedimentation tanks is approximately 70,000 gallons. A single 250,000 gallon sedimentation tank was shown in the design drawings.

- **Filtration System.** The filtration system consists of a surge tank, two filter feed pumps, five bag filter vessels containing 12 bag filters per vessel, and instrumentation, controls and piping. Effluent (overflow) from the sedimentation tanks flows by gravity to the surge tank. The filter feed pumps draw water near the bottom of the surge tank and pump it through the bag filter array and the GAC vessels. The smaller, primary filter feed pump has a reported capacity of approximately 900 gpm, and the larger, secondary filter feed pump has a reported capacity of about 1600 gpm, for a combined total of 2500 gpm. The filter feed pumps start and stop automatically via level switches in the surge tank, with only the primary pump running under normal-flow conditions, and both pumps running under high-flow conditions. The entire flow is pumped through the first filter vessel fitted with 50- μ m bag filters. The flow then splits between two vessels in parallel containing 25- μ m bags, followed by two additional vessels in parallel containing 10- μ m bags. This filter arrangement was consistent with O&M drawing, but differed from the design drawing which showed a single self-cleaning particulate filter. The SWTS operator stated that when both transfer pumps are running, the decreased residence time in the sedimentation system results in high TSS loads to the filter system, requiring daily changeout of all 60 bag filters.
- **Granular Activated Carbon System.** The GAC system consists of two 20,000-pound GAC adsorption vessels, one backwash supply (BWS) tank (two others exist but were not plumbed), and piping and instrumentation. Filtration system effluent is conveyed (by the filter feed pumps) through the two GAC vessels in parallel operation, for removal (adsorption) of dissolved organic contaminants. GAC system effluent discharges to the outfall, and is used to fill the BWS tank, as needed. The GAC beds are backwashed periodically (i.e., monthly under normal conditions) to remove solids, and dirty backwash water is recycled to the storage tank. The GAC vessels were intended to be run in series; however, the SWTS operator stated that this was not possible because of excessive head loss, even with fresh carbon (i.e., inadequate pump head).

Treated water is discharged from the SWTS to the South Yamhill River via the Rock Creek Road Ditch, near the intersection with West Valley Highway.

4. Current SWTS Performance

4.1 Effluent Limitations and Quality

The discharge limits and monitoring requirements specified in the NPDES permit are shown in the following table.

Parameter	Monthly Average (µg/L)	Daily Maximum (µg/L)	Minimum Monitoring Frequency
Arsenic, Total	48	850	Quarterly
Copper	12	18	Monthly
Zinc	110	120	Monthly
Pentachlorophenol	13	20	Monthly
pH	Shall be within the range of 6.0 - 9.0		Monthly

Monthly effluent water quality reports were reviewed by Roland Mueller of PWPO. Throughout 2005, all parameters were within permitted limits with the exception of the December sample. This sample had a pH of 5.76 and a copper concentration of 12.4 µg/L, which were slightly outside of permitted limits. Reportedly, this was the result of difficulties metering treatment chemicals into the mix tanks at that time.

4.2 General Operation

The system appears to function properly under normal operating conditions, which occur over the vast majority of the year. Throughout this report, the phrase “normal operating conditions” refers to periods of operation in which the primary transfer pump is operating but the secondary transfer pump is not. However, two possible conditions could result in failure of the SWTS to meet NPDES permit requirements (assuming all equipment is functioning properly), both of which may occur from an excessive duration and/or intensity of rainfall:

- The flow into the storage tank exceeds the flow out of the storage tank to the sedimentation tanks for a sufficient length of time such that the level in the storage tank exceeds 24 feet. At this point, untreated water is discharged directly to the outfall.
- The flow through the SWTS is high for an extended duration causing the treatment performance of one or more unit processes to deteriorate. For example, this could be poor metals and suspended solids removal in the sedimentation system, or inefficient organics removal in the GAC system. This situation could result in the effluent failing to meet discharge requirements for one or more parameters.

From January 1, 2005 through February 28, 2006, the maximum level in the storage tank was 23.3 feet (Figure 3). This height nearly reached the overflow outlet at 24 feet, and occurred when nearly 3.5 inches of rain fell over a two-day period (12/27 - 12/28/2005). The SWTS was designed under the premise of being able to handle a 25-year storm, which would deliver 3.47 inches of rain over a 24-hour period. Given the tank level and rain observations shown in Figures 2 and 3, these data suggest that the existing SWTS may not be able to handle a 25-year storm without overflowing the storage tank.

Based on 356,000 gallons of flow resulting per inch of rainfall, the 25-year design storm would result in approximately 1.2 million gallons of stormwater flow over a 24-hour period. At 600 and 1800 gpm, the primary and combined primary/secondary transfer pumps can remove 0.86 and 2.6 million gallons per day, respectively. Therefore, based on the combined pumping capacity alone, the capacity appears to be sufficient to prevent overflow during the design storm. This comparison, however, does not account for possible O&M downtime

(e.g., changing bag filters and GAC backwashing), the preexisting water level in the tank, or that the rainfall intensity may not be uniformly distributed over the course of the day.

Over 2005, the level in the storage tank exceeded 19 feet on six days. At 19 feet, the secondary transfer pump turns on, tripling the flow out of the storage tank from 600 to 1800 gpm, and reducing the residence time in all unit treatment process vessels subsequent to the storage tank by a factor of three. This results in difficulties controlling pH, potentially incomplete physical-chemical reactions, and higher TSS concentrations out of the sedimentation tanks. Under these conditions the bag filters require daily changeout, and the GAC filters require more frequent backwashing (requiring partial or total system shutdown). Additionally, expected GAC removal efficiency is reduced under the high-flow conditions. It is uncertain if the discharge requirements are met under high-flow conditions, when both transfer pumps are running, since monitoring events are preferentially performed under normal operating conditions. In general, anecdotal evidence and limited data suggest that the SWTS achieves an adequate level of treatment during normal operating conditions when only the primary transfer pump is running, but that treatment may be inadequate when both the primary and secondary transfer pumps are running.

It should be noted that if additional storage capacity were added to the system, the use of the secondary transfer pump could be precluded, except under extreme conditions. Under current conditions, the 25-year design storm produces about 340,000 gallons per day that either needs to be stored or removed by the secondary transfer pump. The storage tank can currently hold approximately 350,000 gallons of water before the secondary transfer pump turns on. Therefore, if the storage tank was at its minimum level (2 feet) at the start of the storm, it would have sufficient storage to contain the 25-year storm with only the primary transfer pump operating. However, if the tank was at the 19-foot level at the start of the storm, then an additional 340,000 gallons of storage would be required.

When the secondary transfer pump is operating, its flow contribution is not measured on the flow meter. Sheldon Stewart reported that in 2005, when the secondary transfer pump turned on, it ran for a brief period of time (1-2 hours) before the level in the holding tank was reduced to below 19 feet, turning the pump back off. Figure 3 indicates that the secondary transfer pump ran a total of 6 times in 2005. If it is assumed that the pump ran for 2 hours each time, the total flow through the pump was approximately 864,000 gallons. This represents about 5 percent of the total flow of 15.8 million gallons measured through the primary transfer pump in 2005.

5. Impacts on SWTS from Increased Paving (Future Conditions)

Increasing the proportion of paved surfaces in the drainage area will increase the capture efficiency of the conveyance system and will result in higher flows to the SWTS. The maximum rate of stormwater flow to the system if all 21.2 acres were paved is about 576,000 gallons/inch of rain, a 62 percent increase over current conditions (see Attachment C for calculations). If an additional 4.4 acres were paved (making a total of 12.5 acres), as was assumed in the Feasibility Study (CH2M HILL, December 2004), then the estimated flow would be 430,000 gallons/inch of rain, a 21 percent increase over current conditions.

Note, if it is assumed that the current annual flow through the system was 5 percent higher than measured due to flow through the secondary transfer pump, then the flows calculated

above as a result of additional pavement would also increase by 5 percent. However, the relative increase in flow over existing conditions would remain the same. For example, if all 21.2 acres were paved, the flow through the system would increase from 374,000 to 605,000 gallons/inch of rain, a 62 percent increase.

Oil and grease loading to the system would presumably increase slightly with added pavement, since the same amount of oil and grease would drip on the ground surface, but less would infiltrate into the subsurface. However, the increase would not be expected to be significant enough to exceed the capacity of the existing the oil-water separators. Increasing the proportion of paved surfaces in the drainage area is expected to reduce the TSS concentration in the influent stream, since pavement prevents the erosion of surface soil and subsequent entrainment of fine particles into the stormwater runoff. The overall TSS load to the system may decrease as well, but the reduction may not be significant since the decrease in concentration may be offset by the increased flow volume.

Based on current operational data and observations, increasing the amount of surface runoff to the SWTS as currently configured is not recommended. The increased flow would result in more frequent use of the secondary transfer pump. When the secondary transfer pump is operating, the higher flow reduces the residence time in the mixing and sedimentation tanks, resulting in less efficient removal of dissolved metals and TSS and increased operational difficulties. Additionally, the likelihood of reaching the storage tank overflow bypass during heavy rainfall events would increase.

The higher flow through the system resulting from more frequent secondary transfer pump usage would also decrease the residence time in the GAC adsorbers, likely reducing the treatment efficiency for the removal of organics (i.e., pentachlorophenol) as well. Calgon cites a design flow of 500 gpm per vessel for their 20,000 pound adsorbers (similar to those used here). This provides a contact time of 10 minutes (calculated on an empty bed basis, or EBCT). At 1800 gpm, the flow would be 900 gpm per vessel, which is 80 percent above the cited design flow. Note that the filter feed pumps, when both operating, could potentially achieve flows of up to 2500 gpm.

Two improvements that could be made to the existing SWTS to improve its ability to handle the increased flows from additional pavement under most circumstances are:

- Increased storage capacity
- Larger sedimentation tank(s)

The storage capacity of the SWTS could be increased by adding a second storage tank and/or possibly increasing the height of the existing tank. Increasing the storage capacity by 62 percent (an additional 310,000 gallons) would be proportional to the expected increase in flow if the entire drainage area were paved. A 21 percent increase (an additional 105,000 gallons) would be proportional to the expected increase in flow if an additional 4.4 acres of the drainage area were paved.

By increasing the storage capacity proportionally to the expected increase in flow, the frequency of overflow events, if any, would likely be similar to what would occur under existing conditions. However, if an overflow event were to occur, the volume of the discharge would also increase proportionally over what would be discharged under current conditions. Increasing the storage capacity beyond the proportional requirements would

add additional protection against potential overflow events, and provide buffering capacity which would reduce the frequency of occasions where the secondary transfer pump is needed.

A larger sedimentation tank (or possibly multiple tanks) would increase the residence time for settling compared to the existing tanks. Tripling the settling tank volume would potentially achieve the same TSS concentration in the effluent when the secondary transfer pump is operating, as obtained by the current system under normal operating conditions. The combined volume of the four existing sedimentation tanks is approximately 70,000 gallons. The Phase 1 & Phase 2 design originally specified one 250,000 gallon sedimentation tank, which would have over 3.5 times the hydraulic residence time as the existing sedimentation tanks. Since this option would result in more frequent use of the secondary transfer pump, than under current conditions, it is likely that the size or number of GAC adsorbers would need to be increased since this flow would exceed the design capacity of the existing adsorbers.

A separate cost/benefit analysis may be needed to determine whether increasing the storage capacity or increasing the settling tank volume is the best option given current site limitations. Additionally, the amount of pavement to be added to the drainage area needs to be specified in order to select and design the most appropriate system improvements. Regardless of the option selected, and the capital costs related to the necessary improvements, the increased runoff volumes would likely result in increased O&M costs. Some factors which may contribute to the increased O&M costs are:

- Chemicals (caustic, precipitant, coagulant, polymer)
- Filter bags
- Solids handling
- GAC
- Power
- Labor

However, the increased O&M costs may not scale up proportionally with the throughput volume, since some savings may be realized as a result of improvements in treatment efficiency. For example, if sufficient storage is provided such that the use of the secondary transfer pump is reduced even though the total flow through the system is increased, then it is possible that filter bag changeouts would be reduced. This could result in a net cost increase less than the proportion of additional flow, and possibly even result in a net cost savings.

6. Additional Considerations

Separate from the improvements noted above related to increased storage capacity or larger sedimentation tanks, some additional factors may be considered (whether or not additional paving will be performed) which may improve overall system monitoring, performance, and operating costs, such as:

- Installation of an additional flow meter on the discharge side of the secondary transfer pump. This would allow documentation of the flow through each of the pumps, as well

as the combined total flow through the SWTS. A second option would be to install one flow meter that measures the combined total flow.

- Installation of isolation valves on both sides of the transfer pumps (including the flow meters), which would allow the pumps and flow meters to be serviced without having to drain the storage and/or rapid mix tanks. There may be additional locations where isolation valves would be desirable, such as around the filter feed pumps.
- Installation of a turbidity meter between the storage and rapid mix tanks, most likely on the discharge side of the primary transfer pump, near the flow meter. The turbidity of the fluid will be the same through either the primary or secondary pumps.
- Installation of a turbidity meter between the sedimentation tank and the filter system. The combined turbidity measurements will allow tracking of influent water quality and sedimentation system performance over time, and allow for real-time optimization of chemical dosage rates.
- Replacement of the existing 5-vessel bag filtration system with a self-cleaning particulate filter, as specified in the original design. Changing the bag filters in the existing system (60 in all) is a very labor intensive operation, and is required on a daily basis under high-flow conditions. However, the existing bag filter system may be adequate if the storage capacity is expanded such that high-flow conditions are precluded.
- Improvements to the transfer pump and level switch configuration. At present, water is transferred from the storage tank through the treatment system at either 600 or 1800 gpm, and system performance varies greatly at these two flows. It is likely that better overall system performance and flexibility could be achieved using a different combination of single speed pumps and/or a variable speed transfer pump. Pump selection will also depend on if the storage capacity is increased.
- Removal of the settled solids on the bottom of the storage tank. The bottom 2 feet of the storage tank serves a sump where some of the solids may settle and be removed from the influent. The storage tank currently contains about 2 feet of solids (essentially up to the outflow pipe), and reportedly has never been cleaned out. It is doubtful that removing the settled solids will improve the system performance, since new solids will quickly accumulate in the sump. However, some of the solids currently in the sump may have accumulated in the tank prior to 2002, before PWPO took over operation and changed to wood treating products to those not related to the contaminants of concern at the site.
- Installation of sampling ports, where not currently available, at different points in the system so the efficiency of the various unit processes can be readily monitored if necessary. Possibilities include: influent, between the storage tank and rapid mix tank, between the surge tank and filters, and between the filters and GAC.

7. Related Issues

Additional consideration will be given to the 2.6-acre portion of the facility along southern boundary of drainage area in the remedial design. Since this area drains into ditches proposed for cleanout in the remedial action, the potential for recontamination of the

ditches should be minimized. EPA may consider use restrictions for the area or possibly routing the surface water run-off from the area to the SWTS.

With regard to the bypass condition, EPA may consider additional sampling and system improvements to ensure that the system is capable of handling a 25-year, 24-hour storm event, under the site conditions that will exist after the remedial action. Additionally, a hazard analysis may be conducted to determine the impact of a bypass event to the receiving water body. To support this evaluation, EPA may consider the collection of effluent samples for parameters with NPDES discharge limits during high-flow conditions. Additionally, influent samples may be collected under various flow conditions in order to establish SWTS source characteristics and compared to the effluent samples to evaluate treatment efficiency under the different flow regimes.

8. References

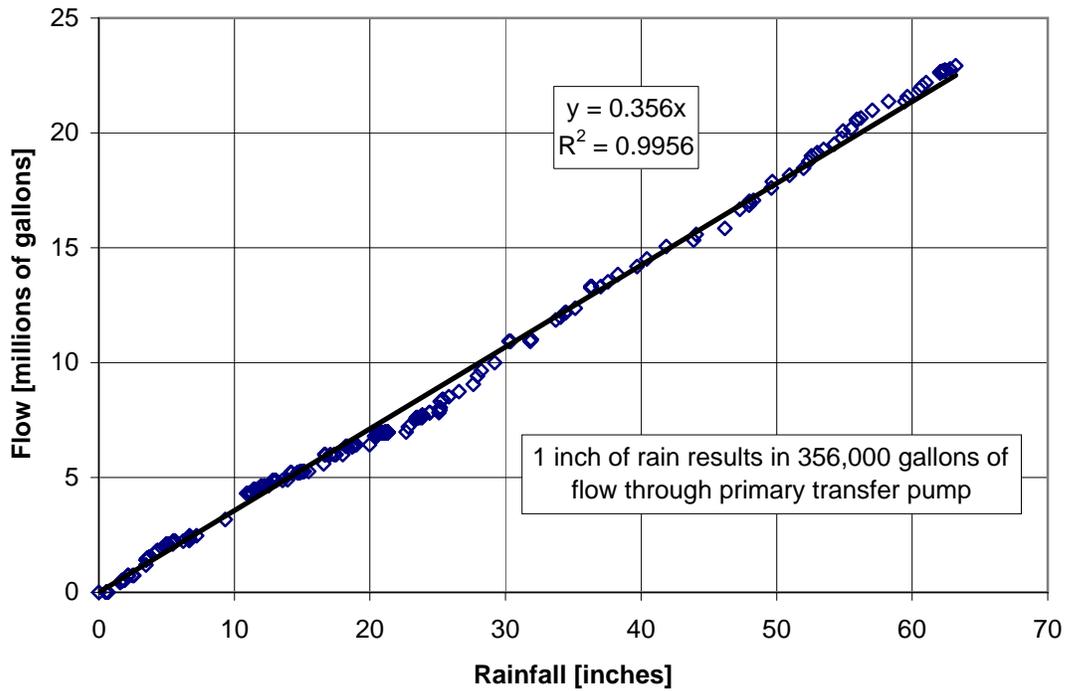
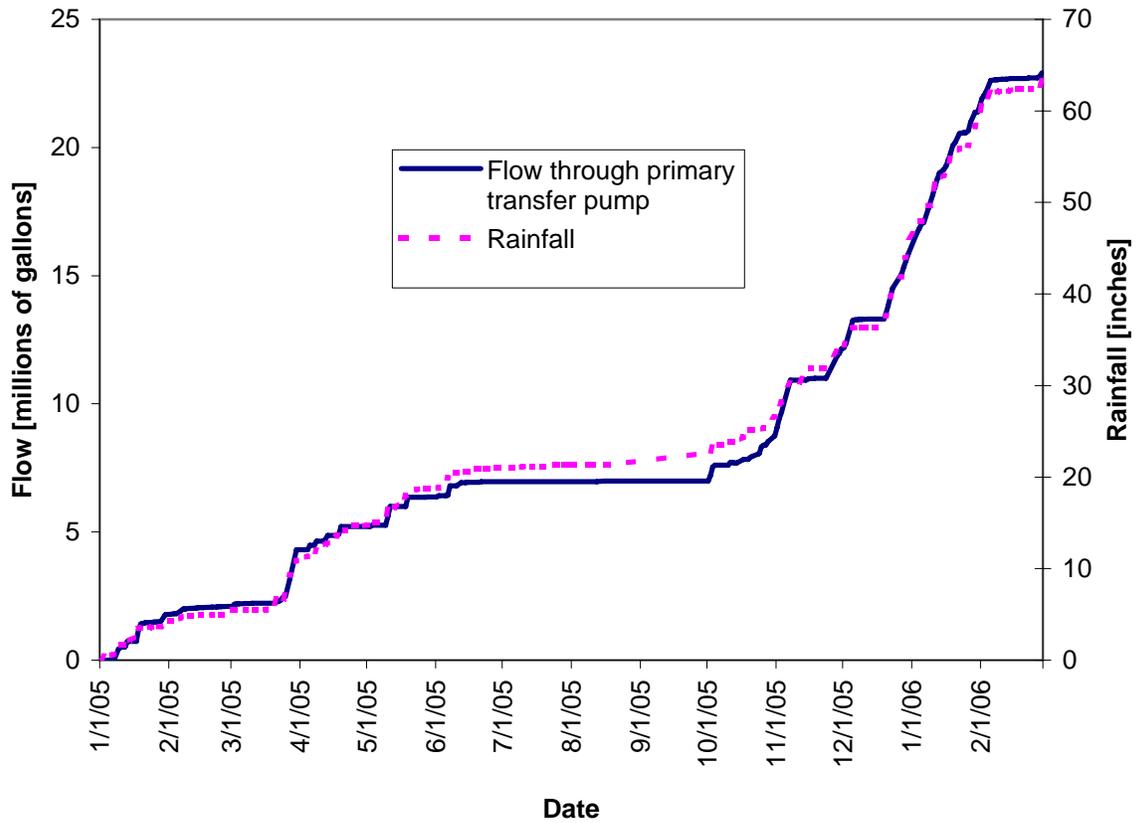
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Maul Foster & Alongi, Inc. (MFA). August 25, 2000. *Draft Stormwater Treatment System Operation and Maintenance Manual*.

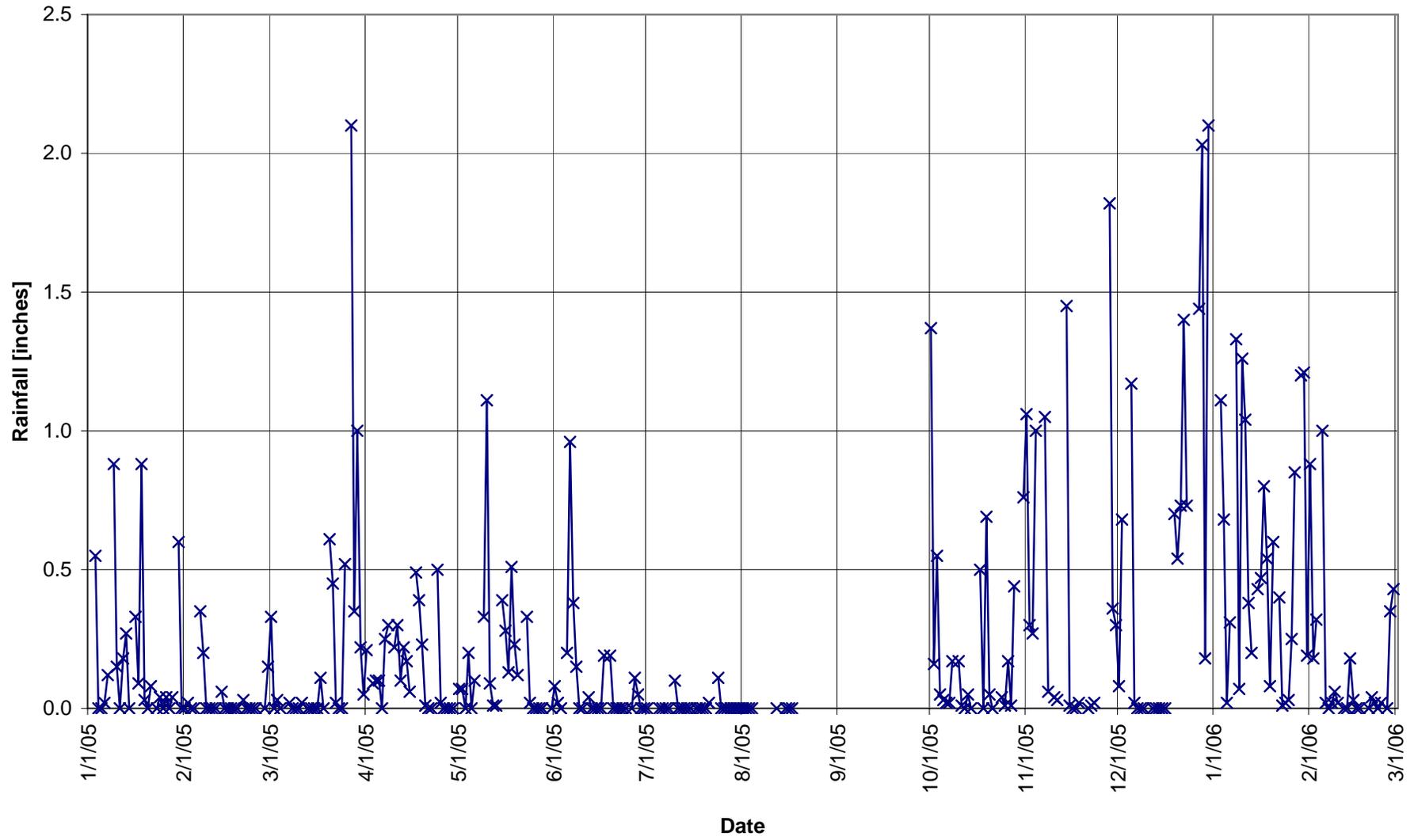
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Figure 1. Cumulative Flow and Rainfall Measurements since January 1, 2005



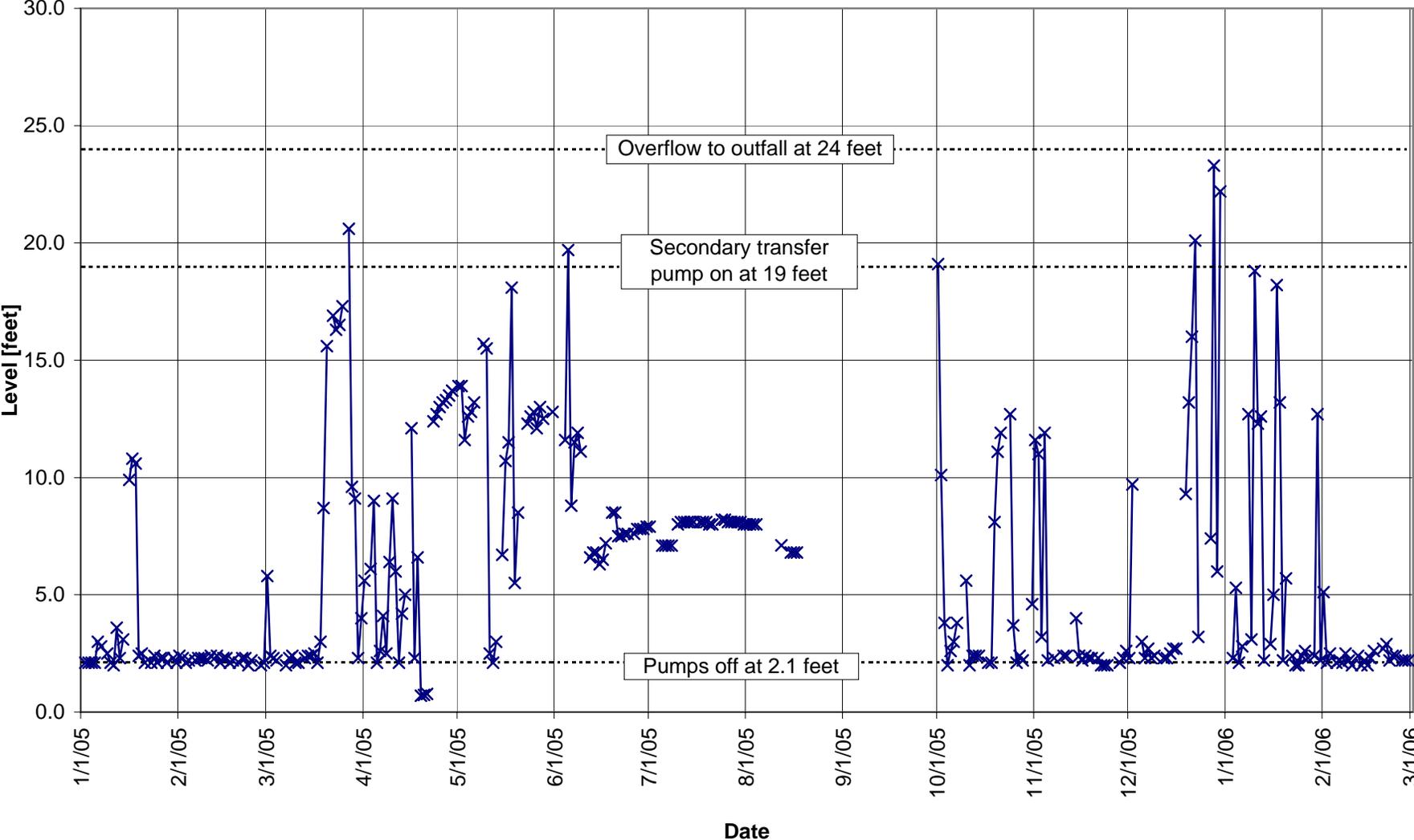
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Figure 2. Daily Rainfall Observations



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Figure 3. Daily Storage Tank Level Observations



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Attachment A
Daily Operating Records

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Pacific Wood Preserving of Oregon
P. O. Box 40
Sheridan, Oregon 97378
503-843-2122 Office
503-843-7058 Fax

Facsimile Sheet

Date: 3-28-06
To: Michael Micmet
From: Sheldon Stewart, Assistant Plant Manager
Subject: Steam Water

Total number of pages transmitted: 29

Here you go mike let me know
if you can't read them

*Thanks
Sheldon*

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Pacific Wood Preserving of Oregon
 Stormwater Treatment System
 Daily Inspection Checklist
 Month/Year 3-05

Feature	Inspection Criteria	Corrective Action Required (Y/N) If Yes, Attach Form																																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31					
Storage Tank	Record Depth																																				
Wet Well Pumps	Proper Operation																																				
Transfer Pumps	Proper Operation																																				
Small-1 & Large-12	Flow, Leakage																																				
Coagulant Drum	Proper Operation																																				
(Blue)	Flow, Leakage																																				
Precipitant Drum	Sufficient Chemical, Leakage																																				
(White)	Sufficient Chemical, Leakage																																				
Polymer Tank (green)	Sufficient Chemical, Leakage																																				
Mixers (M-1 & M-2)	Proper Operation																																				
Metering Pump (MP1 - MP4)	Proper Operation																																				
Transfer Pumps Small-3 & Large-4	Flow, leakage																																				
Bag Filter #1 (BF-1)	Proper Operation																																				
Flow, Leakage	Pressure Diff.																																				
Bag Filter #2 (BF2)	Proper Operation																																				
Flow, Leakage	Pressure Diff.																																				
Bag Filter #3 (BF3)	Proper Operation																																				
Flow, Leakage	Pressure Diff.																																				
Bag Filter #4 (BF4)	Proper Operation																																				
Flow, Leakage	Pressure Diff.																																				
Bag Filter #5 (BF5)	Proper Operation																																				
Flow, Leakage	Pressure Diff.																																				

*Record Pressure Differential

Pacific Wood Preserving of Oregon
 Stormwater Treatment System
 Daily Inspection Checklist
 Month/Year 2005/3

Feature	Inspection Criteria	Corrective Action Required (Y/N) If Yes, Attach Form																														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Flow Meter	Record Daily Reading	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rain Gauge	Record Daily Reading																																

Inspectors Name	Record Daily Reading	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
I.T. M. H.																																	
B. H. P.																																	
Tim D.																																	

Supervisors Signature

Bill Parkney

Date

4/3/05

Pacific Wood Preserving of Oregon
 Stormwater Treatment System
 Daily Inspection Checklist
 Month/Year 4-05

Feature	Inspection Criteria	Corrective Action Required (Y/N) If Yes, Attach Form																																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
Storage Tank	Record Depth																																	
Wet Well Pumps (MW/P1 & MW/P2)	Proper Operation Flow, Leakage	56		6.11	9.0	2.10	9.6	4.1	7.5	5.4	9.0	6.0	2.1	4.2	5.0		6.0	2.3	6.10	1.70	1.73	7.7		12.4	12.7	13.0	13.2	13.3	13.5					13.7
Transfer Pumps Small-1 & Large-12	Proper Operation Flow, Leakage	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Coagulant Drum (blue)	Sufficient Chemical, Leakage	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Precipitant Drum (White)	Sufficient Chemical, Leakage	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Polymer Tank (green)	Sufficient Chemical, Leakage	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Mixers (M-1 & M-2)	Proper Operation	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Metering Pump (MP1 - MP4)	Proper Operation Flow, Leakage	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Transfer Pumps Small-3 & Large-4	Proper Operation Flow, Leakage	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bag Filter #1 (BF1)	Proper Operation Flow, Leakage Pressure Diff.	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bag Filter #2 (BF2)	Proper Operation Flow, Leakage Pressure Diff.	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bag Filter #3 (BF3)	Proper Operation Flow, Leakage Pressure Diff.	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bag Filter #4 (BF4)	Proper Operation Flow, Leakage Pressure Diff.	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bag Filter #5 (BF5)	Proper Operation Flow, Leakage Pressure Diff.	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

*Record Pressure Differential

Pacific Wood Preserving of Oregon
 Stormwater Treatment System
 Daily Inspection Checklist
 Month/Year 5-05

Feature	Inspection Criteria	Corrective Action Required (Y/N) If Yes, Attach Form																															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Storage Tank	Record Depth																																
Wet Well Pumps (WW/P1 & Transfer Pumps)	Proper Operation Flow, Leakage	13.9	13.9	11.6	12.6	12.8	13.2	15.7	15.7	15.5	2.5	2.10	3.0		6.7	10.2	11.5	18.1	5.5	8.5				12.3	12.6	12.8	12.4	13.0	12.5				
Small-1 & Large-12	Proper Operation Flow, Leakage	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Coagulant Drum (blue)	Sufficient Chemical, Leakage	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Precipitant Drum (white)	Sufficient Chemical, Leakage	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Polymer Tank (green)	Sufficient Chemical, Leakage	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Mixers (M-1 & M-2)	Proper Operation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Metering Pump (MP1 - MP4)	Proper Operation Flow, Leakage	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Transfer Pumps Small-3 & Large-4	Proper Operation Flow, Leakage	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Bag Filter #1 (BF1)	Proper Operation Flow, Leakage Pressure Diff.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Bag Filter #2 (BF2)	Proper Operation Flow, Leakage Pressure Diff.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Bag Filter #3 (BF3)	Proper Operation Flow, Leakage Pressure Diff.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Bag Filter #4 (BF4)	Proper Operation Flow, Leakage Pressure Diff.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Bag Filter #5 (BF5)	Proper Operation Flow, Leakage Pressure Diff.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

*Record Pressure Differential

Pacific Wood Preserving of Oregon
 Stormwater Treatment System
 Daily Inspection Checklist
 Month/Year 2-05

Feature	Inspection Criteria	Corrective Action Required (Y/N) If Yes, Attach Form																																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
Storage Tank	Record Depth	7.9	8.0																															
Wet Well Pumps (WWP1 & Transfer Pumps Small-1 & larger/2)	Proper Operation Flow, Leakage	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Coagulant Drum (blue)	Sufficient Chemical, Leakage	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Precipitant Drum (white)	Sufficient Chemical, Leakage	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Polymer Tank (green)	Sufficient Chemical, Leakage	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Mixers (M-1 & M-2)	Proper Operation	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Metering Pump (MP1 - MP4)	Proper Operation Flow, Leakage	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Transfer Pumps Small-3 & Large-4	Proper Operation Flow, Leakage	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Bag Filter #1 (BF1)	Proper Operation Flow, Leakage Pressure Diff.	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Bag Filter #2 (BF2)	Proper Operation Flow, Leakage Pressure Diff.	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Bag Filter #3 (BF3)	Proper Operation Flow, Leakage Pressure Diff.	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Bag Filter #4 (BF4)	Proper Operation Flow, Leakage Pressure Diff.	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Bag Filter #5 (BF5)	Proper Operation Flow, Leakage Pressure Diff.	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

*Record Pressure Differential

Pacific Wood Preserving of Oregon
 Stormwater Treatment System
 Daily Inspection Checklist
 Month/Year 4-9-05

Feature	Inspection Criteria	Corrective Action Required (Y/N) If Yes, Attach Form																														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Flow Meter	Record Daily Reading	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
Rain Gauge	Record Daily Reading																																	

Inspectors Name

Inspectors Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
David Kehret																																		
Tim Dadd																																		
Bill Rankley																																		
Tim H																																		

Supervisors Signature

[Handwritten Signature]

Date

4-1-05

SYSTEM DOWN
 DRAINAGE PROCESS
 DAILY
[Handwritten Signature]

Pacific Wood Preserving of Oregon
 Stormwater Treatment System
 Daily Inspection Checklist
 Month/Year Aug 05

Feature	Inspection Criteria	Corrective Action Required (Y/N) If Yes, Attach Form																															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Storage Tank	Record Depth																																
Wet Well Pumps (MW/PP1 & Transfer Pumps Small-1 & Large-12)	Proper Operation Flow, Leakage	8.0	8.0	8.0	8.0																												
Coagulant Drum (Blue)	Sufficient Chemical, Leakage	X	X	X	X																												
Precipitant Drum (white)	Sufficient Chemical, Leakage	X	X	X	X																												
Polymer Tank (Green)	Sufficient Chemical, Leakage	X	X	X	X																												
Mixers (M-1 & M-2)	Proper Operation	X	X	X	X																												
Metering Pump (MP1 - MP4)	Proper Operation Flow, Leakage	X	X	X	X																												
Transfer Pumps Small-3 & Large-4	Proper Operation Flow, Leakage	X	X	X	X																												
Bag Filter #1 (BF1)	Proper Operation Flow, Leakage Pressure Diff.	X	X	X	X																												
Bag Filter #2 (BF2)	Proper Operation Flow, Leakage Pressure Diff.	X	X	X	X																												
Bag Filter #3 (BF3)	Proper Operation Flow, Leakage Pressure Diff.	X	X	X	X																												
Bag Filter #4 (BF4)	Proper Operation Flow, Leakage Pressure Diff.	X	X	X	X																												
Bag Filter #5 (BF5)	Proper Operation Flow, Leakage Pressure Diff.	X	X	X	X																												

*Record Pressure Differential

*

Pacific Wood Preserving of Oregon
 Stormwater Treatment System
 Daily Inspection Checklist
 Month/Year SEP 05

Feature	Inspection Criteria	Corrective Action Required (Y/N) If Yes, Attach Form																															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Storage Tank	Record Depth																																
Wet Well Pumps	Proper Operation Flow, Leakage																																
Transfer Pumps	Proper Operation Flow, Leakage																																
Coagulant Drum	Sufficient Chemical, Leakage																																
Precipitant Drum	Sufficient Chemical, Leakage																																
Polymer Tank	Sufficient Chemical, Leakage																																
Mixers	Proper Operation																																
Metering Pump	Proper Operation Flow, Leakage																																
Transfer Pumps	Proper Operation Flow, Leakage																																
Bag Filter #1	Proper Operation Flow, Leakage Pressure Diff.																																
Bag Filter #2	Proper Operation Flow, Leakage Pressure Diff.																																
Bag Filter #3	Proper Operation Flow, Leakage Pressure Diff.																																
Bag Filter #4	Proper Operation Flow, Leakage Pressure Diff.																																
Bag Filter #5	Proper Operation Flow, Leakage Pressure Diff.																																

*Record Pressure Differential

Pacific Wood Preserving of Oregon
 Stormwater Treatment System
 Daily Inspection Checklist
 Month/Year 10-1-05

Feature	Inspection Criteria	Corrective Action Required (Y/N) If Yes, Attach Form																																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
Storage Tank	Record Depth																																	
Wet Well Pumps (WWP1 & WWP2)	Proper Operation Flow, Leakage	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Transfer Pumps Small-1 & large12	Proper Operation Flow, Leakage	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Coagulant Drum (blue)	Sufficient Chemical, Leakage	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Precipitant Drum (white)	Sufficient Chemical, Leakage	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Polymer Tank (green)	Sufficient Chemical, Leakage	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Mixers (M-1 & M-2)	Proper Operation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Metering Pump (MP1 - MP4)	Proper Operation Flow, Leakage	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Transfer Pumps Small-3 & Large-4	Proper Operation Flow, Leakage	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Bag Filter #1 (BF1)	Proper Operation Flow, Leakage Pressure Diff.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Bag Filter #2 (BF2)	Proper Operation Flow, Leakage Pressure Diff.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Bag Filter #3 (BF3)	Proper Operation Flow, Leakage Pressure Diff.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Bag Filter #4 (BF4)	Proper Operation Flow, Leakage Pressure Diff.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Bag Filter #5 (BF5)	Proper Operation Flow, Leakage Pressure Diff.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
*Record Pressure Differential																																		
		19.1	10.1	3.9	2.0	2.6	3.0	3.8		5.6	2.0	2.4	2.4	2.4			2.1	2.1	8.1	11.0	11.9			12.7	3.7	2.1	2.4	2.2					4.6	

Pacific Wood Preserving of Oregon
Stormwater Treatment System
Daily Inspection Checklist
Month/Year 11-05

Feature	Inspection Criteria	Corrective Action Required (Y/N) If Yes, Attach Form																																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
Storage Tank	Record Depth																																		
Wet Well Pumps (WWP-1 & Transfer Pumps Small-1 & large-12)	Proper Operation Flow, Leakage																																		
Coagulant Drum (blue)	Sufficient Chemical, Leakage																																		
Precipitant Drum (white)	Sufficient Chemical, Leakage																																		
Polymer Tank (green)	Sufficient Chemical, Leakage																																		
Mixers (M-1 & M-2)	Proper Operation																																		
Metering Pump (MP1 - MP4)	Proper Operation Flow, Leakage																																		
Transfer Pumps Small-3 & Large-4	Proper Operation Flow, Leakage																																		
Bag Filter #1 (BF1)	Proper Operation Flow, Leakage Pressure Diff.																																		
Bag Filter #2 (BF2)	Proper Operation Flow, Leakage Pressure Diff.																																		
Bag Filter #3 (BF3)	Proper Operation Flow, Leakage Pressure Diff.																																		
Bag Filter #4 (BF4)	Proper Operation Flow, Leakage Pressure Diff.																																		
Bag Filter #5 (BF5)	Proper Operation Flow, Leakage Pressure Diff.																																		

*Record Pressure Differential

Pacific Wood Preserving of Oregon
Stormwater Treatment System
Daily Inspection Checklist
Month/Year Dec 05

Feature	Inspection Criteria	Corrective Action Required (Y/N) If Yes, Attach Form																																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
Storage Tank	Record Depth																																		
Wet Well Pumps (WW/P1 & Transfer Pumps Small-1 & Large-12)	Proper Operation Flow, Leakage																																		
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Transfer Pumps Small-3 & Large-4	Proper Operation Flow, Leakage																																		
Bag Filter #1 (BF1)	Proper Operation Flow, Leakage Pressure Diff.																																		
Bag Filter #2 (BF2)	Proper Operation Flow, Leakage Pressure Diff.																																		
Bag Filter #3 (BF3)	Proper Operation Flow, Leakage Pressure Diff.																																		
Bag Filter #4 (BF4)	Proper Operation Flow, Leakage Pressure Diff.																																		
Bag Filter #5 (BF5)	Proper Operation Flow, Leakage Pressure Diff.																																		

*Record Pressure Differential

Pacific Wood Preserving of Oregon
Stormwater Treatment System
Daily Inspection Checklist
Month/Year Feb 06

Feature	Inspection Criteria	Corrective Action Required (Y/N) If Yes, Attach Form																																		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
Storage Tank	Record Depth																																			
Wet Well Pumps (MW/P1 & Transfer Pumps Small-1 & Large-2)	Proper Operation Flow, Leakage																																			
Coagulant Drum (blue)	Sufficient Chemical, Leakage																																			
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Bag Filter #1 (BF1)	Proper Operation Flow, Leakage Pressure Diff.																																			
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Bag Filter #3 (BF3)	Proper Operation Flow, Leakage Pressure Diff.																																			
Bag Filter #4 (BF4)	Proper Operation Flow, Leakage Pressure Diff.																																			
Bag Filter #5 (BF5)	Proper Operation Flow, Leakage Pressure Diff.																																			
*Record Pressure Differential																																				

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Attachment B
NPDES Permit

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**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
 WASTE DISCHARGE PERMIT**

Department of Environmental Quality
 Western Region - Salem Office
 750 Front St. NE, Suite 120, Salem, OR 97301-1039
 Telephone: (503) 378-8240

Issued pursuant to ORS 468B.050 and The Federal Clean Water Act

ISSUED TO:

Pacific Wood Preserving of Oregon
 PO Box 40
 Sheridan OR 97378

SOURCES COVERED BY THIS PERMIT:

<u>Type of Wastewater</u>	<u>Outfall Number</u>	<u>Outfall Location</u>
Treated storm water runoff, treated extracted groundwater, boiler blowdown	003	South Yamhill River RM 38.9
Storm water runoff	005	Rock Creek RM 0.1

FACILITY TYPE AND LOCATION:

Wood Preserving
 22125 Rock Creek Road
 Sheridan, OR 97378

RECEIVING STREAM INFORMATION:

Basin: Willamette
 Sub-Basin: Yamhill
 Stream: South Yamhill
 LLID: 1231445452258-38.9-D
 County: Yamhill

EPA REFERENCE NO: OR002972-6

Issued in response to Application No. 990062 received July 30, 1999.
 This permit is issued based on the land use findings in the permit record.

Michael H. Kortenhof, Western Region Water Quality Manager December 29, 2004

 Date

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, the permittee is authorized to construct, install, modify, or operate a wastewater collection, treatment, control and disposal system and discharge to public waters adequately treated wastewaters only from the authorized discharge point or points established in Schedule A and only in conformance with all the requirements, limitations, and conditions set forth in the attached schedules as follows:

	<u>Page</u>
Schedule A - Waste Discharge Limitations not to be Exceeded	2
Schedule B - Minimum Monitoring and Reporting Requirements	3
Schedule C - Compliance Conditions and Schedules.....	n/a
Schedule D - Special Conditions.....	5
Schedule F - General Conditions.....	6-15

Unless specifically authorized by this permit, by another NPDES or WPCF permit, or by Oregon Administrative Rule, any other direct and indirect discharge to waters of the state is prohibited, including discharge to an underground injection control system.

SCHEDULE A

1. **Waste Discharge Limitations not to be exceeded after permit issuance.**

a. Treated Effluent - Outfall 003

Parameter	Monthly Average (µg/L)	Daily Maximum (µg/L)
Arsenic, Total	48	850
Copper	12	18
Zinc	110	120
Pentachlorophenol	13	20
pH	Shall be within the range of 6.0 – 9.0	

b. Storm Water Outfall 005

Parameter	Limitations
Oil & Grease	Shall no exceed 10 mg/L
pH	Shall be within the range of 6.0 – 9.0
Floating Solids	No visible discharge permitted
Debris*	No discharge permitted

* Debris is defined as anything that will be retained by a 5 mesh screen.

2. Except as provided for in OAR 340-045-0080, no wastes shall be discharged and no activities shall be conducted which violate Water Quality Standards as adopted in OAR 340-041-0445 except in the following defined mixing zone:

Outfall 003:

The mixing zone shall not extend more than 100 feet downstream from the outfall location and 10 feet out from the shoreline. The zone if initial dilution shall not extend more than 10 feet downstream and 10 feet out from the shoreline.

Outfall 005:

The mixing zone shall not exceed that portion of the South Yamhill River within 15 feet from the point of entry of the discharges.

SCHEDULE B

1. **Minimum Monitoring and Reporting Requirements to be met after permit issuance** (unless otherwise approved in writing by the Department).

The permittee shall monitor the parameters as specified below at the locations indicated. The laboratory used by the permittee to analyze samples shall have a quality assurance/quality control (QA/QC) program to verify the accuracy of sample analysis. If QA/QC requirements are not met for any analysis and cannot be re-analyzed, then the results shall be included in the report, but not used in calculations required by this permit. When the permittee cannot re-analyze the existing sample, then they shall re-sample in a timely manner for parameters failing the QA/QC requirements, analyze the samples, and report the results.

- a. Treated Effluent - Outfall 003 (See Note 1, 4)

Item or Parameter	Minimum Frequency	Type of Sample
Arsenic, Total	Quarterly (See Note 2)	Grab
Mercury, Total	Quarterly (See Note 2)	Grab
Dioxins/Furans	2/year (See Note 3)	Grab
Copper, Total	Monthly	Grab
Zinc, Total	Monthly	Grab
Pentachlorophenol	Monthly	Grab
Ammonia	Quarterly	Grab
Boron	Quarterly	Grab
pH	Monthly	Grab

- b. Storm water outfall 005 (See Note 4)

Item or Parameter	Minimum Frequency	Type of Sample
Oil & Grease	Quarterly	Visual Observation
pH	Quarterly	Grab
Floating Solids	Quarterly	Visual Observation
Debris	Quarterly	Visual Observation

Notes:

1. Sampling is required only during months and/or quarters when discharging from the storm water treatment system.
2. Mercury monitoring must be conducted in accordance with EPA Method 1631 or according to any test procedure that the Department has authorized and approved in writing. Mercury monitoring may be discontinued after two years of sampling unless otherwise notified in writing by the Department. Arsenic monitoring must be conducted in accordance with EPA Method 1632 or according to any test procedure that the Department has authorized and approved in writing.
3. Dixon/Furan monitoring must be conducted in accordance with EPA Method 1613. All dioxin and furan congener results of this test shall be reported. Two effluent samples shall be collected within one year of permit issuance space at least thirty days apart. No additional sampling shall be required unless notified in writing by the Department.
4. Quarterly sampling periods are defined as January-March, April-June, July-September, and October – December. During any sampling period that no discharge occurs from the storm water treatment system into outfall 003 or any

quarter that does not produce enough runoff to adequately collect a sample in outfall 005, no sampling is necessary in the respective outfall.

2. **Reporting Procedures**

- a. Monitoring results shall be reported on approved forms. The reporting period is the calendar month. Reports must be submitted to the appropriate Department office by the 15th day of the following month.
- b. For compliance, the analytical results below the level of detection should be reported as Not Detected and the detection limit reported next to it.

SCHEDULE D

Special Conditions

1. This permit authorizes the discharge of storm water, boiler blowdown, and extracted groundwater only. It does not authorize the discharge of process waters. Discharge of boiler blowdown is limited to when the storm water system is in operation and treating storm water to insure there is adequate dilution.
2. The permittee shall implement a contingency plan for prevention and handling of spills and unplanned discharges and the plan shall be in force at all times. A continuing program of employee orientation and education shall be maintained to ensure awareness of the necessity of good in-plant control and quick and proper action in the event of a spill or accident.
3. An environmental supervisor shall be designated to coordinate and carry out all necessary functions related to maintenance and operation of waste collection, treatment, and disposal facilities. This person must have access to all information pertaining to the generation of wastes in the various process areas.
4. Each batch of treated wood must be processed so as to minimize drippage and rainwater leaching if it is stored in the open. Drippage prevention can include vacuum drying in the retort and allowing the treated wood to stand on the drip pad until the preservative has dried and set into the wood.
5. All freshly treated wood must be kept on the drip pad until visible drippage has ceased, pursuant to the requirements of 40 CFR 264.573(k).
6. Transfer of chemicals and storage of full and empty chemical containers shall be conducted on a containment pad such that spillage or contaminated runoff is collected and returned to the plant's collection and recirculation system. In areas where it may be cost prohibitive or impractical to construct containment pads, the facility shall insure that it is strictly employing its spill contingency plan to prevent or minimize any spills and to respond immediately if a spill occurs. The Department shall be notified per Schedule F, Section D.5 of any spills that occur.
7. The drip pad and containment pads shall be maintained free of cracks, corrosion or other deterioration that could cause hazardous waste to leak from the pads pursuant to requirements of 40 CFR 264.573(c)
8. If a condition is detected that could lead to a release of hazardous waste, the condition must be repaired within a reasonably prompt period of time following discovery or the pad must be removed from service pursuant to requirements of 40 CFR 264.573(m).
9. The drip pad and containment pads shall be operated and maintained in a manner to prevent tracking of hazardous waste off the drip pad by personnel or equipment pursuant to requirements of 40 CFR 264.573(j).
10. Prior to constructing or modifying wastewater treatment facilities, detailed plans and specifications must be approved in writing by the Department. Minor deviations from Department approved designs shall not require Department approval if these deviations are deemed necessary by the permittee to facilitate proper construction or operation of the treatment system.
11. Prior to the inclusion of extracted groundwater from additional wells into the treatment system, permittee shall notify the Department and receive written authorization.
12. Permittee shall notify the Department and receive approval prior to the use of additional wood treating chemicals.

**NPDES GENERAL CONDITIONS
(SCHEDULE F)**

SECTION A. STANDARD CONDITIONS

1. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of Oregon Revised Statutes (ORS) 468B.025 and is grounds for enforcement action; for permit termination, suspension, or modification; or for denial of a permit renewal application.

2. Penalties for Water Pollution and Permit Condition Violations

Oregon Law (ORS 468.140) allows the Director to impose civil penalties up to \$10,000 per day for violation of a term, condition, or requirement of a permit.

In addition, a person who unlawfully pollutes water as specified in ORS 468.943 or ORS 468.946 is subject to criminal prosecution.

3. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. In addition, upon request of the Department, the permittee shall correct any adverse impact on the environment or human health resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

4. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and have the permit renewed. The application shall be submitted at least 180 days before the expiration date of this permit.

The Director may grant permission to submit an application less than 180 days in advance but no later than the permit expiration date.

5. Permit Actions

This permit may be modified, suspended, revoked and reissued, or terminated for cause including, but not limited to, the following:

- a. Violation of any term, condition, or requirement of this permit, a rule, or a statute;
- b. Obtaining this permit by misrepresentation or failure to disclose fully all material facts; or
- c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

The filing of a request by the permittee for a permit modification or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

6. Toxic Pollutants

The permittee shall comply with any applicable effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

7. Property Rights

The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege.

8. Permit References

Except for effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants and standards for sewage sludge use or disposal established under Section 405(d) of the Clean Water Act, all rules and statutes referred to in this permit are those in effect on the date this permit is issued.

SECTION B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls, and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Duty to Halt or Reduce Activity

For industrial or commercial facilities, upon reduction, loss, or failure of the treatment facility, the permittee shall, to the extent necessary to maintain compliance with its permit, control production or all discharges or both until the facility is restored or an alternative method of treatment is provided. This requirement applies, for example, when the primary source of power of the treatment facility fails or is reduced or lost. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

3. Bypass of Treatment Facilities

a. Definitions

(1) "Bypass" means intentional diversion of waste streams from any portion of the treatment facility. The term "bypass" does not include nonuse of singular or multiple units or processes of a treatment works when the nonuse is insignificant to the quality and/or quantity of the effluent produced by the treatment works. The term "bypass" does not apply if the diversion does not cause effluent limitations to be exceeded, provided the diversion is to allow essential maintenance to assure efficient operation.

(2) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities or treatment processes which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Prohibition of bypass.

- (1) Bypass is prohibited unless:
 - (a) Bypass was necessary to prevent loss of life, personal injury, or severe property damage;
 - (b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and
 - (c) The permittee submitted notices and requests as required under General Condition B.3.c.
- (2) The Director may approve an anticipated bypass, after considering its adverse effects and any alternatives to bypassing, when the Director determines that it will meet the three conditions listed above in General Condition B.3.b.(1).

c. Notice and request for bypass.

- (1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior written notice, if possible at least ten days before the date of the bypass.
- (2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in General Condition D.5.

4. Upset

- a. Definition. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operation error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.
- b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of General Condition B.4.c are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
- c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - (1) An upset occurred and that the permittee can identify the causes(s) of the upset;
 - (2) The permitted facility was at the time being properly operated;
 - (3) The permittee submitted notice of the upset as required in General Condition D.5, hereof (24-hour notice); and
 - (4) The permittee complied with any remedial measures required under General Condition A.3 hereof.

- d. Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

5. Treatment of Single Operational Event

For purposes of this permit, A Single Operational Event which leads to simultaneous violations of more than one pollutant parameter shall be treated as a single violation. A single operational event is an exceptional incident which causes simultaneous, unintentional, unknowing (not the result of a knowing act or omission), temporary noncompliance with more than one Clean Water Act effluent discharge pollutant parameter. A single operational event does not include Clean Water Act violations involving discharge without a NPDES permit or noncompliance to the extent caused by improperly designed or inadequate treatment facilities. Each day of a single operational event is a violation.

6. Overflows from Wastewater Conveyance Systems and Associated Pump Stations

a. Definitions

- (1) "Overflow" means the diversion and discharge of waste streams from any portion of the wastewater conveyance system including pump stations, through a designed overflow device or structure, other than discharges to the wastewater treatment facility.
- (2) "Severe property damage" means substantial physical damage to property, damage to the conveyance system or pump station which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of an overflow.
- (3) "Uncontrolled overflow" means the diversion of waste streams other than through a designed overflow device or structure, for example to overflowing manholes or overflowing into residences, commercial establishments, or industries that may be connected to a conveyance system.

b. Prohibition of overflows. Overflows are prohibited unless:

- (1) Overflows were unavoidable to prevent an uncontrolled overflow, loss of life, personal injury, or severe property damage;
- (2) There were no feasible alternatives to the overflows, such as the use of auxiliary pumping or conveyance systems, or maximization of conveyance system storage; and
- (3) The overflows are the result of an upset as defined in General Condition B.4. and meeting all requirements of this condition.

c. Uncontrolled overflows are prohibited where wastewater is likely to escape or be carried into the waters of the State by any means.

d. Reporting required. Unless otherwise specified in writing by the Department, all overflows and uncontrolled overflows must be reported orally to the Department within 24 hours from the time the permittee becomes aware of the overflow. Reporting procedures are described in more detail in General Condition D.5.

7. Public Notification of Effluent Violation or Overflow

If effluent limitations specified in this permit are exceeded or an overflow occurs, upon request by the Department, the permittee shall take such steps as are necessary to alert the public about the extent and nature of the discharge. Such steps may include, but are not limited to, posting of the river at access points and other places, news releases, and paid announcements on radio and television.

8. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in such a manner as to prevent any pollutant from such materials from entering public waters, causing nuisance conditions, or creating a public health hazard.

SECTION C. MONITORING AND RECORDS

1. Representative Sampling

Sampling and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring points specified in this permit and shall be taken, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water, or substance. Monitoring points shall not be changed without notification to and the approval of the Director.

2. Flow Measurements

Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated and maintained to insure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than ± 10 percent from true discharge rates throughout the range of expected discharge volumes.

3. Monitoring Procedures

Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.

4. Penalties of Tampering

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than two years, or by both. If a conviction of a person is for a violation committed after a first conviction of such person, punishment is a fine not more than \$20,000 per day of violation, or by imprisonment of not more than four years or both.

5. Reporting of Monitoring Results

Monitoring results shall be summarized each month on a Discharge Monitoring Report form approved by the Department. The reports shall be submitted monthly and are to be mailed, delivered or otherwise transmitted by the 15th day of the following month unless specifically approved otherwise in Schedule B of this permit.

6. Additional Monitoring by the Permittee

If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR 136 or as specified in this permit, the results of this monitoring shall be included in the

calculation and reporting of the data submitted in the Discharge Monitoring Report. Such increased frequency shall also be indicated. For a pollutant parameter that may be sampled more than once per day (e.g., Total Chlorine Residual), only the average daily value shall be recorded unless otherwise specified in this permit.

7. Averaging of Measurements

Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean, except for bacteria which shall be averaged as specified in this permit.

8. Retention of Records

Except for records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR part 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records of all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

9. Records Contents

Records of monitoring information shall include:

- a. The date, exact place, time and methods of sampling or measurements;
- b. The individual(s) who performed the sampling or measurements;
- c. The date(s) analyses were performed;
- d. The individual(s) who performed the analyses;
- e. The analytical techniques or methods used; and
- f. The results of such analyses.

10. Inspection and Entry

The permittee shall allow the Director, or an authorized representative upon the presentation of credentials to:

- a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit, and
- d. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by state law, any substances or parameters at any location.

SECTION D. REPORTING REQUIREMENTS

1. Planned Changes

The permittee shall comply with Oregon Administrative Rules (OAR) 340, Division 52, "Review of Plans and Specifications". Except where exempted under OAR 340-52, no construction, installation, or modification involving disposal systems, treatment works, sewerage systems, or common sewers shall be commenced until the plans and specifications are submitted to and approved by the Department. The permittee shall give notice to the Department as soon as possible of any planned physical alternations or additions to the permitted facility.

2. Anticipated Noncompliance

The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

3. Transfers

This permit may be transferred to a new permittee provided the transferee acquires a property interest in the permitted activity and agrees in writing to fully comply with all the terms and conditions of the permit and the rules of the Commission. No permit shall be transferred to a third party without prior written approval from the Director. The permittee shall notify the Department when a transfer of property interest takes place.

4. Compliance Schedule

Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date. Any reports of noncompliance shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

5. Twenty-Four Hour Reporting

The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally (by telephone) within 24 hours, unless otherwise specified in this permit, from the time the permittee becomes aware of the circumstances. During normal business hours, the Department's Regional office shall be called. Outside of normal business hours, the Department shall be contacted at 1-800-452-0311 (Oregon Emergency Response System).

A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. If the permittee is establishing an affirmative defense of upset or bypass to any offense under ORS 468.922 to 468.946, and in which case if the original reporting notice was oral, delivered written notice must be made to the Department or other agency with regulatory jurisdiction within 4 (four) calendar days. The written submission shall contain:

- a. A description of the noncompliance and its cause;
- b. The period of noncompliance, including exact dates and times;
- c. The estimated time noncompliance is expected to continue if it has not been corrected;
- d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance; and
- e. Public notification steps taken, pursuant to General Condition B.7.

The following shall be included as information which must be reported within 24 hours under this paragraph:

- a. Any unanticipated bypass which exceeds any effluent limitation in this permit.

- b. Any upset which exceeds any effluent limitation in this permit.
- c. Violation of maximum daily discharge limitation for any of the pollutants listed by the Director in this permit.

The Department may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

6. Other Noncompliance

The permittee shall report all instances of noncompliance not reported under General Condition D.4 or D.5, at the time monitoring reports are submitted. The reports shall contain:

- a. A description of the noncompliance and its cause;
- b. The period of noncompliance, including exact dates and times;
- c. The estimated time noncompliance is expected to continue if it has not been corrected; and
- d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

7. Duty to Provide Information

The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine compliance with this permit. The permittee shall also furnish to the Department, upon request, copies of records required to be kept by this permit.

Other Information: When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Department, it shall promptly submit such facts or information.

8. Signatory Requirements

All applications, reports or information submitted to the Department shall be signed and certified in accordance with 40 CFR 122.22.

9. Falsification of Information

A person who supplies the Department with false information, or omits material or required information, as specified in ORS 468.953 is subject to criminal prosecution.

10. Changes to Indirect Dischargers - [Applicable to Publicly Owned Treatment Works (POTW) only]

The permittee must provide adequate notice to the Department of the following:

- a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of the Clean Water Act if it were directly discharging those pollutants and;
- b. Any substantial change in the volume or character of pollutants being introduced into the POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
- c. For the purposes of this paragraph, adequate notice shall include information on (i) the quality and quantity of effluent introduced into the POTW, and (ii) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

11. Changes to Discharges of Toxic Pollutant - [Applicable to existing manufacturing, commercial, mining, and silvicultural dischargers only]

The permittee must notify the Department as soon as they know or have reason to believe of the following:

- a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - (1) One hundred micrograms per liter (100 µg/L);
 - (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
 - (3) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7); or
 - (4) The level established by the Department in accordance with 40 CFR 122.44(f).
- b. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - (1) Five hundred micrograms per liter (500 µg/L);
 - (2) One milligram per liter (1 mg/L) for antimony;
 - (3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7); or
 - (4) The level established by the Department in accordance with 40 CFR 122.44(f).

SECTION E. DEFINITIONS

1. BOD means five-day biochemical oxygen demand.
2. TSS means total suspended solids.
3. mg/L means milligrams per liter.
4. kg means kilograms.
5. m³/d means cubic meters per day.
6. MGD means million gallons per day.
7. Composite sample means a sample formed by collecting and mixing discrete samples taken periodically and based on time or flow.
8. FC means fecal coliform bacteria.
9. Technology based permit effluent limitations means technology-based treatment requirements as defined in 40 CFR 125.3, and concentration and mass load effluent limitations that are based on minimum design criteria specified in OAR 340-41.
10. CBOD means five day carbonaceous biochemical oxygen demand.
11. Grab sample means an individual discrete sample collected over a period of time not to exceed 15 minutes.
12. Quarter means January through March, April through June, July through September, or October through December.
13. Month means calendar month.
14. Week means a calendar week of Sunday through Saturday.
15. Total residual chlorine means combined chlorine forms plus free residual chlorine.
16. The term "bacteria" includes but is not limited to fecal coliform bacteria, total coliform bacteria, and E. coli bacteria.
17. POTW means a publicly owned treatment works.

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Attachment C
Drainage Area Calculations and Figures

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4/5/06 M. Niemet

Capture efficiency of unpaved area:

$$n_u = \frac{A_I - A_p}{A_T - A_p} = \frac{13.1 - 8.1}{21.2 - 8.1} = \underline{\underline{38.17\%}}$$

← unpaved area that acts as if impervious
← unpaved area

Check calculation assuming 100% capture efficiency for the paved areas:

$$A_I = A_p(1) + (A_T - A_p)n_u$$

$$13.1 = 8.1 + (21.2 - 8.1)0.3817 = 13.1 \quad \checkmark$$

What is the worst-case flow that would be produced through the swtS, per inch of rain, if the whole capture area was paved?

$$\left(\frac{Q}{R}\right)_{\max} = \left(\frac{356,000 \text{ gal}}{\text{in}}\right) \frac{21.2}{13.1} = \underline{\underline{576,000 \frac{\text{gal}}{\text{in}}}}$$

62% increase

What is the estimated flow if an additional 4.4 acres are paved — as assumed in the FS?

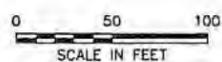
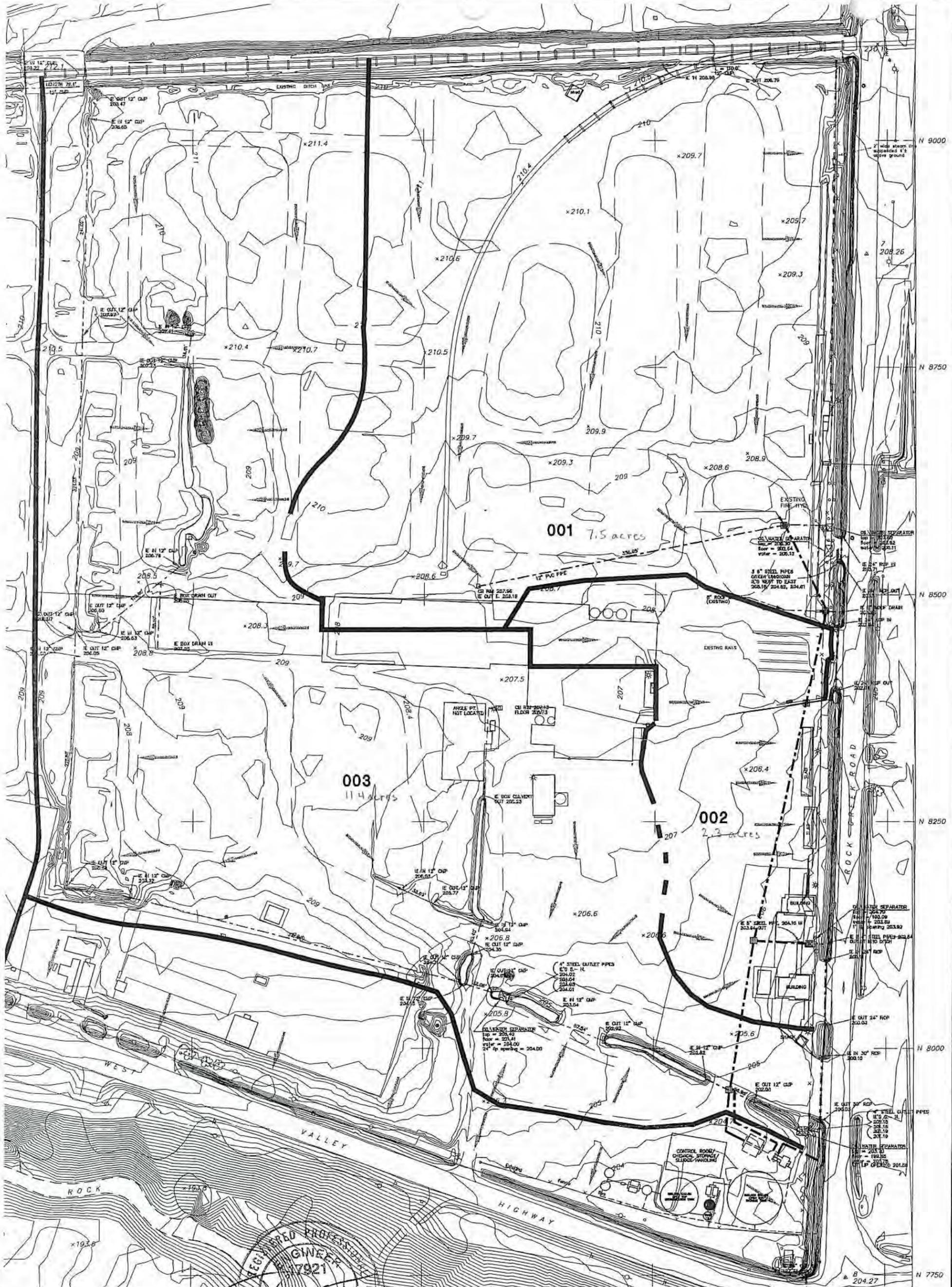
Paved
Unpaved as impervious

$$A_{I,FS} = 8.1 + 4.4 + (21.2 - 8.1 - 4.4)0.3817$$

$$= 12.5 + (8.7)0.3817 = 15.82 \text{ acres}$$

$$\left(\frac{Q}{R}\right)_{FS} = \left(\frac{356,000 \text{ gal}}{\text{in}}\right) \frac{15.82}{13.1} = \underline{\underline{430,000 \frac{\text{gal}}{\text{in}}}}$$

21% increase



Existing 6155ac

REV	DATE	DESCRIPTION	OWN BY	DES BY	CHK BY	APP BY
1	8/00	PHASE 2	JLN	AWC	SPT	SPT
0	2/08	PRELIMINARY PLAN	JLN	AWC	SPT	SPT

DATE OF ISSUE	OWN BY	DES BY	CHK BY	APP BY
2/98	JLN	A. CLARY	S. TAYLOR	S. TAYLOR

Maul Foster & Alongi, Inc.

TAYLOR LUMBER AND TREATING, INC.
 SHERIDAN, OREGON
 STORMWATER TREATMENT SYSTEM
 PHASE 1 AND PHASE 2

TREATING PLANT DRAINAGE AREAS

DRAWING NO. **1**
 PROJECT NO. 8002.001.014

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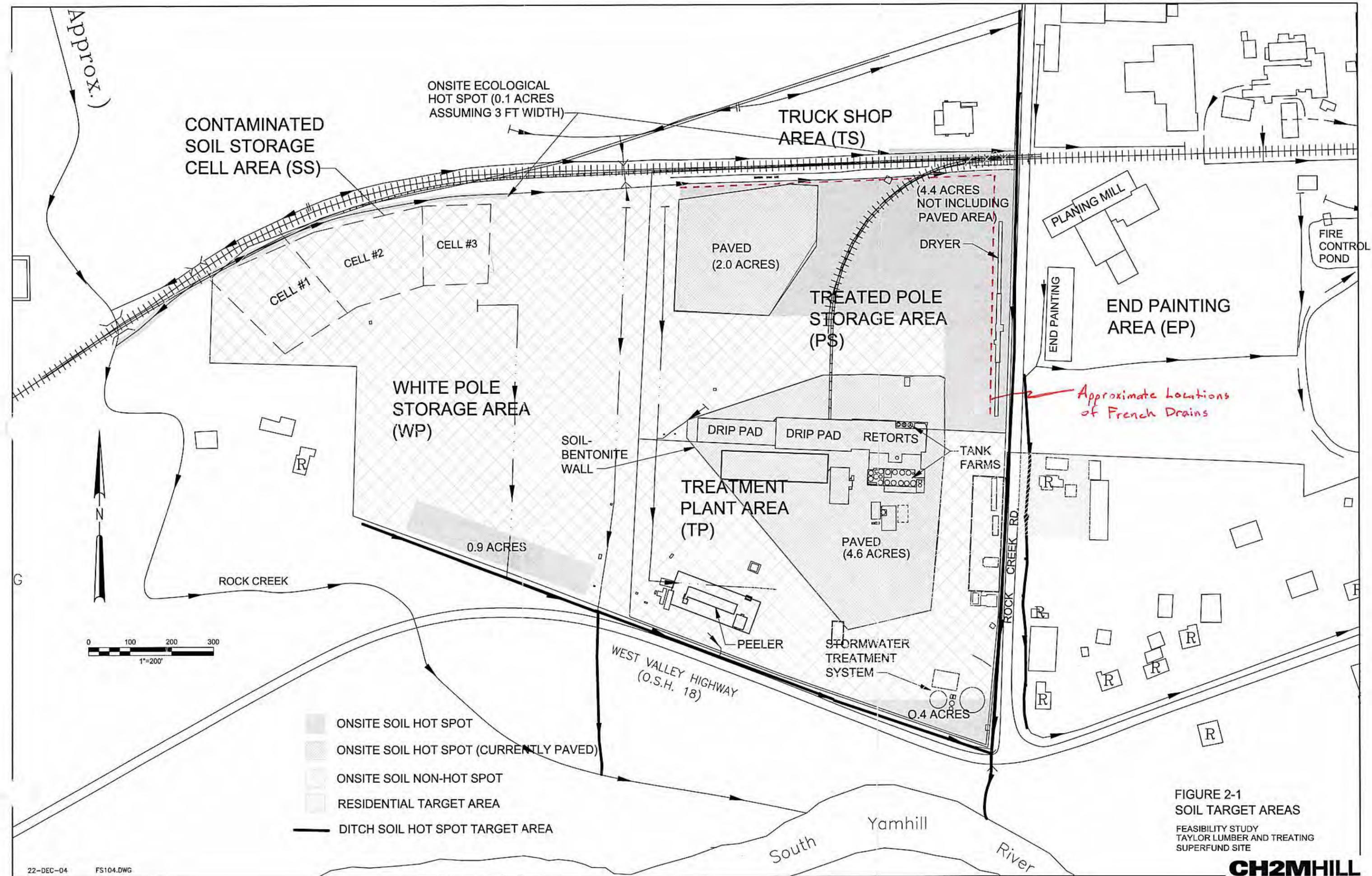
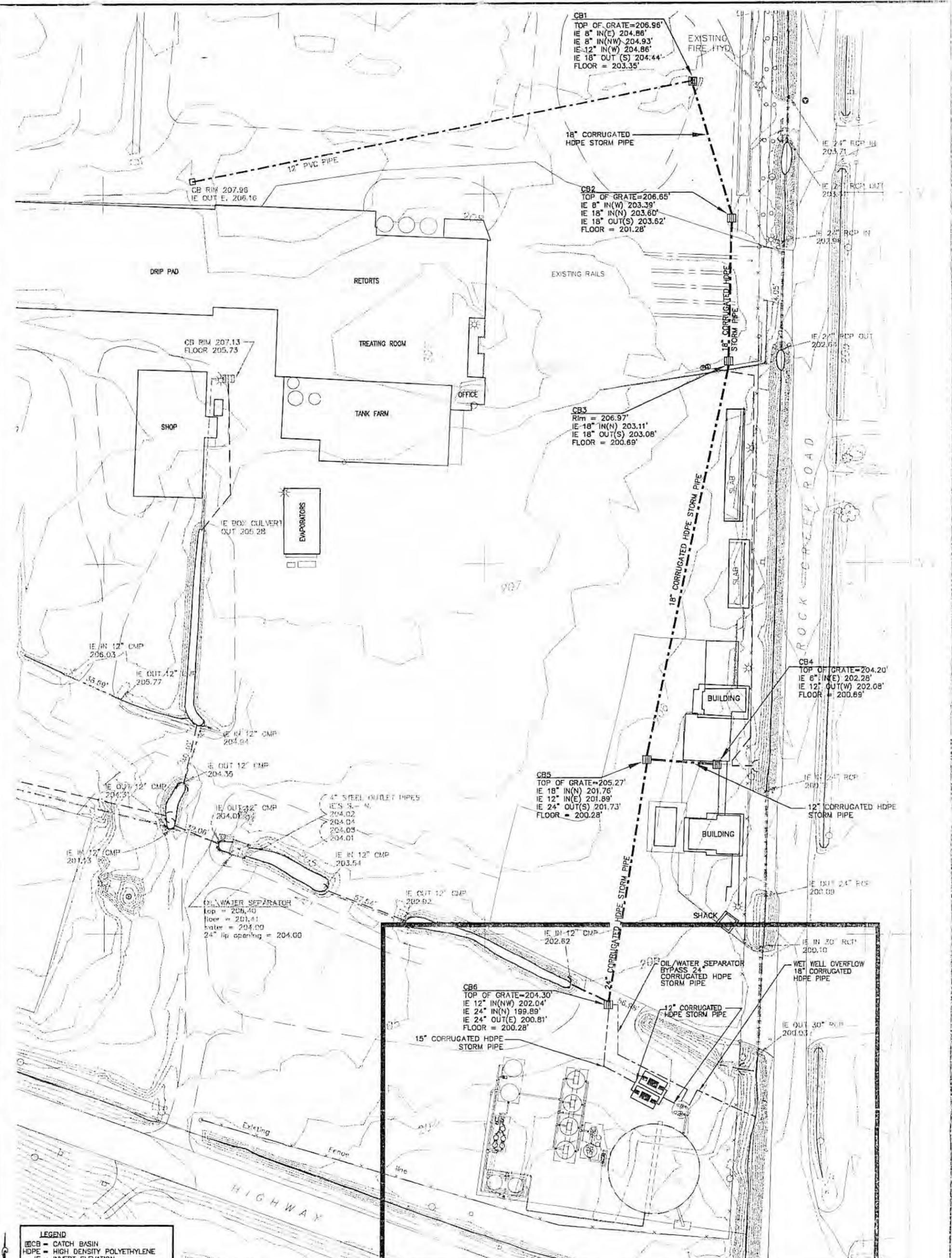


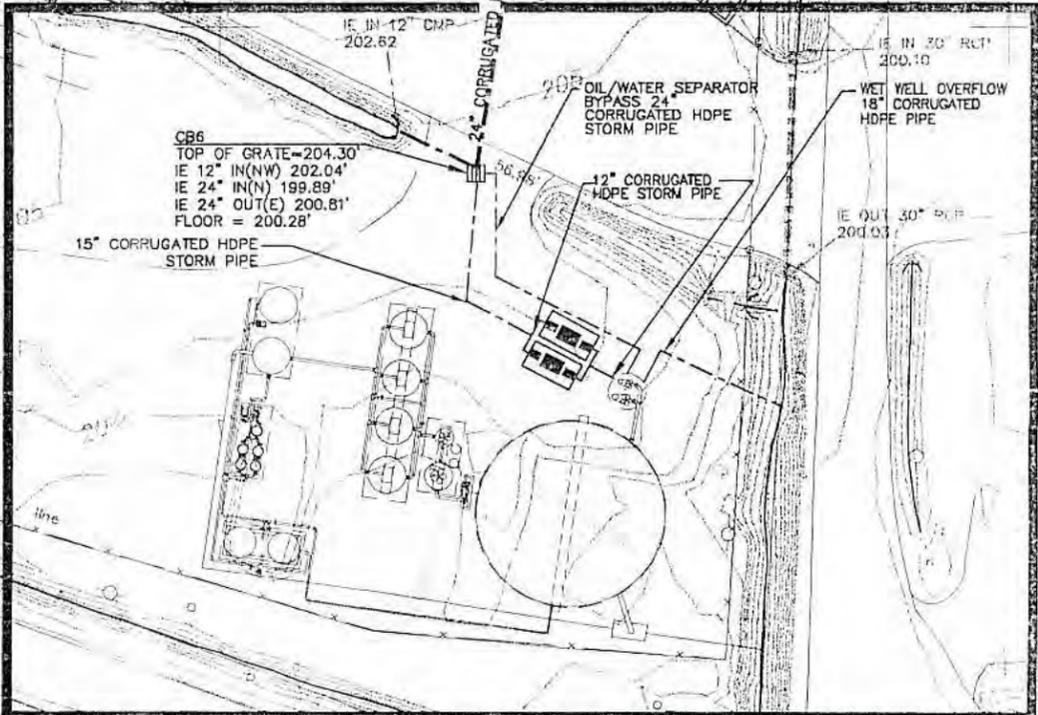
FIGURE 2-1
SOIL TARGET AREAS
FEASIBILITY STUDY
TAYLOR LUMBER AND TREATING
SUPERFUND SITE

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LEGEND
 □ CB - CATCH BASIN
 HDPE - HIGH DENSITY POLYETHYLENE
 IE - INVERT ELEVATION
 STS - STORMWATER TREATMENT SYSTEM
 CMP - CORRUGATED METAL PIPE

0 30 60
 SCALE IN FEET



SEE DRAWING 2 FOR GREATER DETAIL OF TREATMENT SYSTEM LAYOUT

REV	DATE	DESCRIPTION	OWN BY	DES BY	CHK BY	APP BY
3	8/00	RESPONSE TO USEPA	JLN	AWC	SPT	SPT
2	12/99	ELEV. CHANGE FOR PIPE INC.	JLN	AWC	SPT	SPT
1	12/99	CONVEYANCE ELEV. CHANGE	JLN	AWC	SPT	SPT
0	2/98	PRELIMINARY PLAN	JLN	AWC	SPT	SPT
REV	DATE	DESCRIPTION	OWN BY	DES BY	CHK BY	APP BY
	DATE OF ISSUE		JLN		S. TAYLOR	
	2/98		A. CLARY		S. TAYLOR	

Maul Foster & Alongi, Inc.

TAYLOR LUMBER AND TREATING, INC.
 SHERIDAN, OREGON
 STORMWATER TREATMENT SYSTEM
 OPERATION AND MAINTENANCE MANUAL
CONVEYANCE PIPING

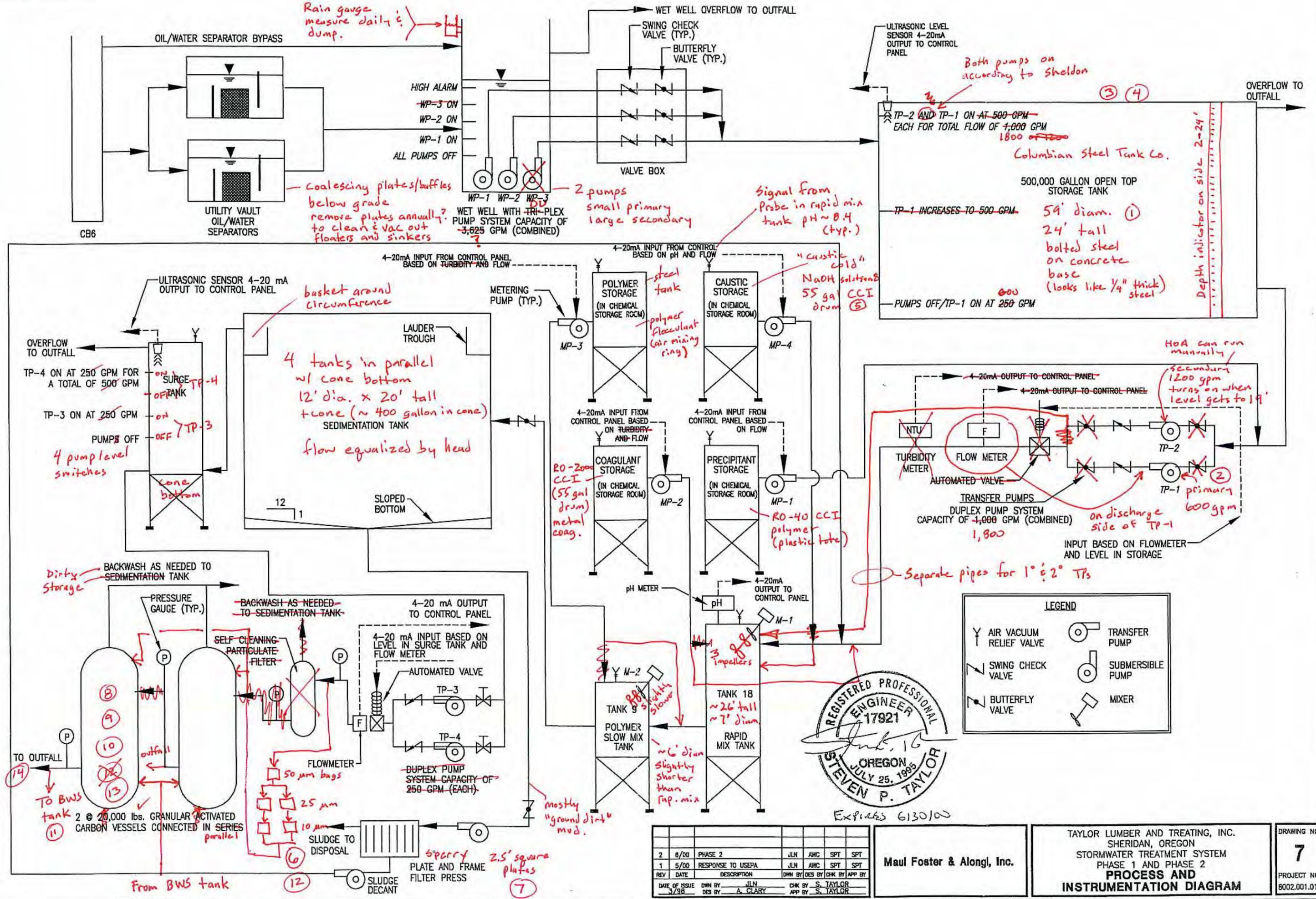
DRAWING NO.
1
 PROJECT NO.
 8002.001.014

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Attachment D
Process and Instrument Diagram Notes

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Field notes from site visit
4/3/06 - Sheldon Stewart



REV	DATE	DESCRIPTION	OWN BY	DES BY	CHK BY	APP BY
2	8/00	PHASE 2	JLN	AWC	SPT	SPT
1	5/00	RESPONSE TO USEPA	JLN	AWC	SPT	SPT
DATE OF ISSUE 3/98						
OWN BY JLN			CHK BY S. TAYLOR			
DES BY A. CLARY			APP BY S. TAYLOR			

Maul Foster & Alongi, Inc.

TAYLOR LUMBER AND TREATING, INC.
 SHERIDAN, OREGON
 STORMWATER TREATMENT SYSTEM
 PHASE 1 AND PHASE 2
PROCESS AND INSTRUMENTATION DIAGRAM

DRAWING NO. **7**
 PROJECT NO. 8002.001.014

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Notes:

- ① Never cleaned out ~ 2' of silt on bottom. Low-level dump setpoint is ~ 2', outlet is even lower.
- ② When just primary pump running, settling tank effluent looks clear. With both pumps running effluent gets cloudy.
- ③ Maybe could increase height of tank (structural considerations.)
- ④ Roughly 46' of empty space between entrance road and concrete base of wet well. Could possibly be used for a 2nd storage tank.
- ⑤ Cherokee Chemical, Inc. (CCI)
- ⑥ 5 bag filter units w/ 12 bag filters per unit. Need to remove many bolts from the top of each unit to replace
- ⑦ collect solids and press once per year during summer. Need to perform during shut-down. Need to flush solids out w/ a fire hose. Waste has become RCRA F-032 since they have added process water. - But last year they were able to use as fill onsite.
- ⑧ Backwash ~ every 2 weeks during heavy flow
~ every 1 month during normal flow
- ⑨ Run in parallel. Tried series but starts constricting flow during high flow times - even w/ fresh carbon.
- ⑩ Clean Environmental Concepts provides carbon
- ⑪ Have 3 tanks to use for BWS. Only 1 is hooked up now - enough to backwash only 1 GAC

11. cont.

Plan to hook up other 2, so can BW both GACs at once.

(12) When 45 psi on inlet to any of the bags change all.

(13) At most need 1 1/2 BWS tank to get clean water after backwashing.

(14) Effluent sampling right at outfall to ditch

- some parameters monthly

- some quarterly

- some 2/yr, 1/yr

(15) 2 bag filter units w/ 15 bag filters per unit.

Need to remove more water from the top of each unit to replace

(16) Collect solids and press once per year during summer. Need to perform during shut-down.

Need to flush solids out w/ a fire hose.

Waste has become RCRA F-035 since

they have added process water. - but last

year they were able to use as fill onsite.

(17) Backwash - every 2 weeks during heavy flow in every 1 month during normal flow

(18) Run in parallel. Tried series but starts

constituting flow during high flow times - even w/ fresh carbon.

(19) Clean Environmental Concepts provides carbon

(20) Have 3 tanks to use for BWS. Only 1

hooked up now - enough to backwash only 1

Attachment E
Site Visit Photos - April 3, 2006

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Photo 1. Standing at the oil-water separators.



Photo 2. Wet well (foreground) and 500,000 gallon storage tank.



Photo 3. Rapid mix tank (foreground) and slow mix tank.



Photo 4. Sedimentation tanks.



Photo 5. Outside chemical storage shed.



Photo 6. Inside chemical storage shed (left).



Photo 7. Inside chemical storage shed (right).



Photo 8. Bag filter vessels.



Photo 9. Surge tank (foreground) and backwash tanks. The only backwash tank currently in use is the one on the right.



Photo 10. GAC vessels.



Photo 11. Plate-and-frame filter press.

H Stormwater Treatment System Operations and Maintenance Manual

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

Reply To
Attn Of: OOO

November 7, 2000



via facsimile and certified mail

Vince Gullette
Taylor Lumber & Treating, Inc.
PO Box 158
Sheridan, OR 97378

Re: Storm Water Treatment System—Operations and Maintenance Manual; Taylor Lumber and Treating, Inc., Civil Action No. 93-858-JO Consent Decree, USEPA Docket No. 10-94-0244-RCRA Administrative Order on Consent, ODEQ NPDES Permit No. 101267, and EQC Docket No. WQIW-WR-94-101 Mutual Agreement and Order

Dear Mr. Gullette:

The Oregon Department of Environmental Quality (ODEQ) and the Environmental Protection Agency have reviewed the Draft Storm Water Treatment System (SWTS) Operation and Maintenance Manual (O &M Manual) for Taylor Lumber and Treating, Inc, dated August 25, 2000. This letter is to advise you that ODEQ and EPA are disapproving the plan and requiring several modifications. Attached are ODEQ and EPA's comments and recommended changes to the O&M Manual. Please prepare a revised plan that addresses the Agencies' comments by November 17, 2000.

If you have any questions regarding the matters discussed in this letter and the attached comments, please contact Bryson Twidwell, ODEQ, at (503) 378-8240, ext. 284, Bruce Long, EPA, at (503) 326-3686, or Mike Slater, EPA, at (503) 326-5872. Questions for legal counsel may be directed to Jennifer Byrne, EPA, at (206) 553-0050. We look forward to your response.

Sincerely,

Tim McFetridge, P.E.
Senior Environmental Engineer
Oregon Dept. of Environmental Quality

Bruce Long
RCRA Compliance Officer
U.S. Environmental Protection Agency

Enclosure

cc: Steve Taylor and Jim Maul, Maul Foster & Alongi
Jerry Hodson and Steve Hill, Miller Nash
Bryson Twidwell, Oregon DEQ
Gil Hargreaves, Oregon DEQ

bcc: Mike Slater, OOO
Jennifer Byrne, ORC-158
Jennifer MacDonald, ORC-158
Loren McPhillips, ECL-115
Mike Sibley, ECL-116

ATTACHMENT

TECHNICAL REVIEW STORM WATER TREATMENT SYSTEM Operations and Maintenance Manual AUGUST 25, 2000 TAYLOR LUMBER & TREATING, INC. SHERIDAN, OREGON

The U.S. Environmental Protection Agency and Oregon Department of Environmental Quality ("the Agencies") have reviewed the Taylor Lumber & Treating, Inc. Operations and Maintenance Manual ("O&M Manual") for the storm water treatment system (SWTS) dated August 25, 2000. The Agencies are disapproving the O&M Manual and are requiring the following modifications.

GENERAL COMMENT

Overall, the O & M Manual appears to meet design objectives and engineering requirements for operating and maintaining the SWTS. One obvious problem is that many of the supporting manufacturer's documents for system components are not currently in the Appendices. The Agencies assume that the documentation is now available and will be submitted in the revised version of this O&M Manual.

The Agencies require that a bypass alarm be placed on all bypass outlets, and that procedures for responding to bypasses be identified in the O&M Manual.

In addition, Taylor L:umber must submit to ODEQ the Material Safety Data Sheets for all chemicals used in the treatment, cleaning, and maintenance of the storm water treatment system.

System Components:

Paragraph 2.2 must include as a feature to be inspected for maintenance the drainage ditch that runs from the new asphalt pad at the northwest end of the storage yard, in front of the offloading pad west of the Subpart W drip pad, and connecting to the ditch that runs on the north side of the peeler. This ditch is on the west side of the retorts and shop and north of the peeler.

Deficiency Corrections:

The following comment applies to Paragraphs 2.4.3, 3.4.3, 4.4.3, 5.4.9, 6.4.3, and 6.4.3:

A 14-day time period for correcting deficiencies is unacceptable; all deficiencies must be corrected within 24 hours of discovery. If a repair or deficiency requires more than 24 hours to correct, Taylor Lumber must report it to the Agencies immediately and seek verbal approval for a longer correction period. Taylor Lumber must follow with a written request for a longer correction period and must complete corrections within the period agreed to by the Agencies.

Maintenance:

The following comment applies to maintenance of all equipment for which manufacturer's documentation has been or will be included in the O&M Manual.

The manufacturer's recommendations for maintenance of all SWTS equipment must be included in the text of the O&M Manual; inclusion of manufacturer's documentation in appendices is not sufficient. Scheduled maintenance must be organized in the O&M Manual such that it is clear at what intervals each task will be performed.

In addition, valve lubrication for valves identified in paragraphs 3.4.1, 4.4.1, 5.4.7, and 6.4.1 must be included as maintenance items.

Sludge will be generated in the 500,000-gallon storage tank (paragraph 4.4) and in the sedimentation tanks (paragraph 5.4.6). Taylor Lumber must describe in these paragraphs the procedures for handling and removing sludge.

Preventive Maintenance:

The following comment applies to Paragraphs 2.4.4, 3.4.4, 4.4.4, and 5.4.10:

Annual tests and inspections for preventive maintenance must occur by August 30 of each year.

Inspections and Inspection Schedules:

A signature block for supervisor oversight of the inspection procedures must be added to the inspection checklists in Appendix D. Additional items are to be added to the checklist and are described below.

Paragraph 2.4.1 must include as a feature to be inspected for maintenance the drainage ditch that runs from the new asphalt pad at the northwest end of the storage yard, in front of the offloading pad west of the Subpart W drip pad, and connecting to the ditch that runs on the north side of the peeler. This ditch is on the west side of the retorts and shop and north of the peeler. This feature must also be added to the inspection checklist in Appendix D.

Paragraph 2.4.2 must include an additional requirement for a daily visual inspection for improper run-off from facility drainage during heavy storm events (greater than 1 inch of precipitation in an hour).

Paragraph 3.4.2 must be amended to reflect the following requirements: The oil-water separators must be inspected once a week and daily during heavy storm events (greater than 1 inch of precipitation in an hour). The wet well must be inspected once a week. The centrifuge pumps must be inspected daily. The floats, control panel, and valves may be inspected once every two weeks.

In addition, sludge accumulation in the oil-water separator and the wet well must be measured daily. Taylor Lumber must define a method for measuring the sludge accumulation and must submit the proposal to the Agencies for review.

Paragraph 4.4.2. Sludge accumulation in the 500,000-gallon storage tank must be measured monthly. Taylor Lumber must define a method for measuring the sludge accumulation and must submit the proposal to the Agencies for review.

Paragraph 5.4.8 must be amended to reflect the following requirements: The transfer pumps TP-1 and TP-2 must be inspected daily, and the lubrication frequency must be added to the maintenance schedule. The floats in the storage tank, the tanks, the filter press, control panels, and valves must be inspected once every two weeks. The mixers, chemical tanks, and metering pumps must be inspected daily. Chemicals in storage must be inspected monthly.

In addition, sludge accumulation in the sedimentation tank must be measured weekly. Taylor Lumber must define a method for measuring the sludge accumulation and must submit the proposal to the Agencies for review.

Paragraph 6.4.2 must be amended to reflect the following requirement: The transfer pumps TP-3 and TP-4 and the bag filter system must be inspected daily. As part of the filter system inspection, Taylor Lumber must record the head-pressure to show when the filters require replacement or cleaning.

In addition, sludge accumulation in the surge tank must be measured daily. Taylor Lumber must define a method for measuring the sludge accumulation and must submit the proposal to the Agencies for review.

Disposal of Solid Waste:

The following comment applies to Paragraphs 2.4.5, 3.4.5, 4.4.5, 5.4.11, 6.4.5, and 7.4.5

Solids and debris removed during maintenance and cleaning of all components of the SWTS will be managed as hazardous wastes listed under 40 CFR § 261.31 and as required under 40 CFR § 268.40. All containers used to accumulate solids and debris must be labeled and stored according to the limitation specified under 40 CFR § 262.34.

Record Keeping:

The following "Bypass Report" is required when stormwater is diverted through the bypass system:

- 1) When a bypass occurs, Taylor Lumber must prepare and submit a report to ODEQ within five days of the event. The report shall describe the date and time of the event, an explanation for why the bypass occurred, the volume of water flowing through the bypass, what measures were taken to correct the bypass overflow, and when emergency response notice was given to the agencies.
- 2) Taylor Lumber shall sample the bypass flows for the parameters listed in Taylor Lumber's NPDES permit every four hours until the bypass stops and shall submit the samples to their laboratory. The laboratory shall analyze the first and last samples and samples collected every twelve hours after the start of the bypass. Taylor Lumber shall report the results of the laboratory analysis to ODEQ. ODEQ may require additional analysis of the stored samples or if additional sample collection and analysis is required. If the bypass exceeds NPDES limits, Taylor Lumber must comply with the following paragraphs.

Emergency Response and Posting of Telephone Numbers:

The following requirements shall be reflected in the O&M Manual:

Emergency response telephone numbers such as the National Spill Response and the Oregon Spill Response telephone numbers shall be posted near the bypass alarms, within the control room, and in other areas where Taylor Lumber staff will congregate during business hours.

In addition, when bypass flows occur, the City of Sheridan's drinking water facility and the Oregon State Health Division Drinking Water program must be notified. These telephone numbers shall also be posted in prominent locations and accessible to Taylor Lumber staff. Taylor Lumber must also notify local newspaper, radio, and television stations at the time the bypass occurs. Sample results of the bypass shall be reported to the City of Sheridan and the Oregon State Health Division Drinking Water program.

Maul Foster & Alongi, Inc.

Environmental & Engineering Services

December 1, 2000
Project 8002-001.014

Bruce Long
U.S. Environmental Protection Agency
Region 10 - Oregon Operations Office
811 SW Sixth Avenue
Portland, Oregon 97204

RECEIVED

DEC 04 REC'D

Timothy McFetridge, P.E.
Oregon Department of Environmental Quality
Western Region - Salem Office
750 Front St. NE, Suite 120
Salem, Oregon 97310

Environmental Cleanup Office

Re: Response to Comments on the Draft Stormwater Treatment System Operations and Maintenance Manual; Taylor Lumber & Treating, Inc., Sheridan, Oregon
USEPA ID No. ORD-009-04-2532
Civil Action No. 93-858-JO (Consent Decree) and USEPA Docket No. 10-94-0244
RCRA Administrative Order on Consent

Dear Mr. Long and Mr. McFetridge:

Maul Foster & Alongi, Inc. (MFA) has prepared this letter on behalf of Taylor Lumber & Treating, Inc. (Taylor Lumber) to respond to comments from the U.S. Environmental Protection Agency (USEPA) and the Oregon Department of Environmental Quality (DEQ) dated November 7, 2000 on the Draft Stormwater Treatment System (SWTS) Operations and Maintenance (O&M) manual dated August 25, 2000. USEPA and DEQ's comments are repeated below in italics with Taylor Lumber's response following in normal text. The revised O&M manual is attached. The revised manual is unbound and only includes revised text and supporting information. The revised text and supporting information are three hole punched so that they can be inserted into the previously submitted binder.

GENERAL COMMENTS

Overall, the O&M Manual appears to meet design objectives and engineering requirements for operating and maintaining the SWTS. One obvious problem is that many of the supporting manufacturer's documents for system components are not currently in the

Appendices. The Agencies assume that the documentation is now available and will be submitted in the revised version of this O&M Manual.

The additional manufacturer's documentation is included with the revised O&M manual.

The Agencies require that a bypass alarm be placed on all bypass outlets, and that procedures for responding to bypasses be identified in the O&M Manual.

Floats have been installed at the invert of each of the overflows. If water reaches the level of an overflow it actuates a strobe light mounted on top of the sedimentation tanks. The procedures for responding to this alarm are identified in the manual.

In addition, Taylor Lumber must submit to ODEQ the Material Safety Data Sheets for all chemicals used in the treatment, cleaning, and maintenance of the storm water treatment system.

The MSDS for the treatment chemicals and lubricants are included in a new Appendix to the O&M manual. Taylor Lumber does not plan on using any chemicals to clean the SWTS.

SPECIFIC COMMENTS

System Components:

Paragraph 2.2 must include as a feature to be inspected for maintenance the drainage ditch that runs from the new asphalt pad at the northwest end of the storage yard, in front of the offloading pad west of the Subpart W drip pad, and connecting to the ditch that runs on the north side of the peeler. This ditch is on the west side of the retorts and shop and north of the peeler.

This feature has been added to the drainage feature inspection.

Deficiency Corrections:

The following comment applies to Paragraphs 2.4.3, 3.4.3, 4.4.3, 5.4.9, 6.4.3, and 6.4.3:

A 14-day time period for correcting deficiencies is unacceptable; all deficiencies must be corrected within 24 hours of discovery. If a repair or deficiency requires more than 24 hours to correct, Taylor Lumber must report it to the Agencies immediately and seek verbal approval for a longer correction period. Taylor Lumber must follow with a written request

for a longer correction period and must complete corrections within the period agreed to by the Agencies.

The text in the referenced sections has been modified to reflect the above comment. At this time, Taylor Lumber's NPDES permit only requires notification to DEQ. While Taylor Lumber is willing to notify the USEPA of any deficiencies, it is concerned that there may be a delay in obtaining approval or a potential disagreement between the agencies that would place Taylor Lumber in an untenable position. Therefore, Taylor Lumber has modified the referenced sections to include notification to DEQ and USEPA, while retaining the requirement to obtain verbal and subsequently written approval from only the DEQ.

Maintenance:

The following comment applies to maintenance of all equipment for which manufacturer's documentation has been or will be included in the O&M Manual.

The manufacturer's recommendations for maintenance of all SWTS equipment must be included in the text of the O&M Manual; inclusion of manufacturer's documentation in appendices is not sufficient. Scheduled maintenance must be organized in the O&M Manual such that it is clear at what intervals each task will be performed.

A maintenance checklist has been added to the O&M manual to address scheduled maintenance. This checklist is meant to address the maintenance recommended by Taylor Lumber and the equipment manufacturers. Scheduled maintenance is in addition to maintenance or repairs that are required as a result of system inspections.

In addition, valve lubrication for valves identified in paragraphs 3.4.1, 4.4.1, 5.4.7, and 6.4.1 must be included as maintenance items.

The text has been modified to reflect the above comment. The text was modified in Sections 3.4.4, 4.4.4, 5.4.10 and 6.4.4 instead of the above referenced sections.

Sludge will be generated in the 500,000-gallon storage tank (paragraph 4.4) and in the sedimentation tanks (paragraph 5.4.6). Taylor Lumber must describe in these paragraphs the procedures for handling and removing sludge.

The text has been modified to reflect the above comment. The text was modified in Sections 4.4 and 5.4.5 instead of the above referenced sections.

Preventative Maintenance:

The following comment applies to Paragraphs 2.4.4, 3.4.4, 4.4.4, and 5.4. 10:

Annual tests and inspections for preventive maintenance must occur by August 30 of each year.

The text of the O&M manual has been modified to reflect this comment.

Inspections and Inspection Schedules:

A signature block for supervisor oversight of the inspection procedures must be added to the inspection checklists in Appendix D. Additional items are to be added to the checklist and are described below.

The signature block has been added to the inspection checklists.

Paragraph 2.4.1 must include as a feature to be inspected for maintenance the drainage ditch that runs from the new asphalt pad at the northwest end of the storage yard, in front of the offloading pad west of the Subpart W drip pad, and connecting to the ditch that runs on the north side of the peeler. This ditch is on the west side of the retorts and shop and north of the peeler. This feature must also be added to the inspection checklist in Appendix D.

This feature has been added to the text of the O&M manual and the inspection checklist in Appendix D.

Paragraph 2.4.2 must include an additional requirement for a daily visual inspection for improper run-off from facility drainage during heavy storm events (greater than 1 inch of precipitation in an hour).

The text of the manual has been modified to reflect this comment. In addition, the inspection checklist has been modified so that in the event of a storm with greater than 1 inch of precipitation in an hour run-off will be evaluated as part of the daily inspection. Please note that the inspection checklists have been modified to reflect frequency of inspection (e.g., daily inspections are on one checklist, weekly inspections are on one checklist etc.)

Paragraph 3.4.2 must be amended to reflect the following requirements: The oil-water separators must be inspected once a week and daily during heavy storm events (greater than 1 inch of precipitation in an hour). The wet well must be inspected once a week. The

centrifuge pumps must be inspected daily. The floats, control panel, and valves may be inspected once every two weeks.

The above comment has been incorporated into the text and the respective inspection checklists have been modified.

In addition, sludge accumulation in the oil-water separator and the wet well must be measured daily. Taylor Lumber must define a method for measuring the sludge accumulation and must submit the proposal to the Agencies for review.

Stormwater has passed through the oil-water separators and wet well since they were installed during February 2000. Taylor Lumber measured the depth of solids in the wet well and the oil water separators during October 2000 and did not find any measurable accumulation. Taylor Lumber respectfully requests that the requirement for daily sludge measurements in the wet well and oil water separators be changed to monthly measurement based on operational history. The procedure for sludge measurement is discussed in the text of the manual and below.

Solids accumulation in the wet well and the oil water separator will be measured once a month between November 1 and June 30. The depth of solids will be checked in the three chambers of each oil water separator using a gauging rod. The depth of solids in the wet well will be evaluated by manually turning the smaller wet well pump on and pumping the water down to the level of the pump intake. A visual observation will then be made as to whether solids are building up enough to affect the flow of water to the pumps. Gauging with a rod or other device is impractical within the wet well pump house. During the annual inspection the wet well pump house will be removed and the wet well evacuated for a more accurate measurement of solids accumulation.

Paragraph 4.4.2. Sludge accumulation in the 500,000-gallon storage tank must be measured monthly. Taylor Lumber must define a method for measuring the sludge accumulation and must submit the proposal to the Agencies for review.

Solids accumulation in the 500,000 gallon storage tank will be measured monthly between November 1 and June 30. The depth of solids in the tank will be completed using either a sludge measuring optical gauge (such as the one manufactured by Orenco Systems; see Appendix F) or a gauging rod whichever is determined to be more effective.

Paragraph 5.4.8 must be amended to reflect the following requirements: The transfer pumps TP-1 and TP-2 must be inspected daily, and the lubrication frequency must be added to the

maintenance schedule. The floats in the storage tank, the tanks, the filter press, control panels, and valves must be inspected once every two weeks. The mixers, chemical tanks, and metering pumps must be inspected daily. Chemicals in storage must be inspected monthly.

The text of the O&M manual and the respective checklists have been modified to reflect this comment.

In addition, sludge accumulation in the sedimentation tank must be measured weekly. Taylor Lumber must define a method for measuring the sludge accumulation and must submit the proposal to the Agencies for review.

The text of the O&M manual and the respective checklists have been modified to reflect this comment.

Paragraph 6.4.2 must be amended to reflect the following requirement: The transfer pumps TP-3 and TP-4 and the bag filter system must be inspected daily. As part of the filter system inspection, Taylor Lumber must record the head-pressure to show when the filters require replacement or cleaning.

The text of the O&M manual and the respective checklists have been modified to reflect this comment.

In addition, sludge accumulation in the surge tank must be measured daily. Taylor Lumber must define a method for measuring the sludge, accumulation and must submit the proposal to the Agencies for review.

The surge tank does not accumulate solids. The filtration system transfer pumps draw off the bottom of the cone of the surge tank. Taylor Lumber respectfully requests that the requirement to measure sludge in the surge tank be eliminated.

Disposal of Solid Waste:

The following comment applies to Paragraphs 2.4.5, 3.4.5, 4.4.5, 5.4.11, 6.4.5, and 7.4.5

Solids and debris removed during maintenance and cleaning of all components of the SWTS will be managed as hazardous wastes listed under 40 CFR § 261.31 and as required under 40 CFR § 268.40. All containers used to accumulate solids and debris must be labeled and stored according to the limitation specified under 40 CFR § 262.34.

Taylor Lumber does not agree that the solids produced during treatment of stormwater are listed hazardous wastes. While they may potentially be characteristic hazardous wastes, this potential cannot be determined until the solids are produced and characterized pursuant to 40 CFR § 261.24.

Taylor Lumber's position is consistent with the *USEPA Wood Preserving Resource Conservation and Recovery Act (RCRA) Compliance Guide - A Guide to Federal Environmental Regulations* (the Guide) dated June 1996. According to Section 4-3 of the Guide, stormwater does not meet the definition of wastewater. Only rainwater which falls into treatment and process areas (e.g., sumps, drip pads etc..) is considered wastewater. Taylor Lumber collects rainwater which falls into treatment and process areas and treats it as wastewater in Taylor Lumber's evaporation system, therefore this wastewater does not enter the SWTS.

Chapter 6-1 of the Guide clarifies this by stating: "Because of the high cost of controlling wastes in storage yards (e.g., building storage sheds and paving storage yards), EPA has imposed minimal RCRA regulation on the management of storage yards at wood preserving facilities. Because of enhanced waste minimization efforts throughout the wood preserving industry and the drip pad operating standards of Subpart W, little waste, if any, is generated in these areas."

Chapter 6-2 of the Guide continues by stating: "Generally, stormwater runoff in storage yards is not considered a listed waste. EPA has clarified that the hazardous waste listings for wood preserving chemicals do not apply to precipitation run-off from treated wood in storage yards without drip pads, where the owner or operator has allowed the treated wood to sit on the drip pad until the drippage has stopped." Taylor Lumber's drip pad and elevated drip trays are designed and operated so that drippage is collected prior to transferring the treated wood to the treated wood storage areas.

In addition, Chapter 6-2 of the Guide states "EPA encourages the construction of stormwater run-off mitigation systems and the appropriate handling of sediments generated as a result of such management. In addition, any of these wastes may exhibit a characteristic of hazardous waste, even though they may not meet a listing description." It is apparent from this language that USEPA does not automatically consider the sediments contained within stormwater to be a listed waste. Rather, USEPA recognizes that sediments that are generated in the stormwater treatment process should be analyzed for possible designation as a characteristic waste per 40 CFR 261.24.

Finally, Chapter 6-2 of the Guide states "In the case of incidental drippage in storage yards, owners/operators must maintain a spill contingency plan for such occurrences. If the facility does not have documentation that it is in compliance with Subpart W, EPA can assert that the stormwater transported a listed hazardous waste and that the resulting sludge also carries the listing." Again, the language of the Guide indicates that the USEPA does not automatically consider stormwater collected in treated wood storage areas to be a listed hazardous waste.

Taylor Lumber operates a "state of the art" drip pad in compliance with Subpart W. In addition, Taylor Lumber has a spill contingency plan to address incidental drippage in storage yards. For these reasons, Taylor Lumber does not believe that stormwater or the sediment produced from the treatment of stormwater can be considered a listed hazardous waste. Therefore, the O&M manual obligates Taylor Lumber to analyze the collected sediments pursuant to 40 CFR 261.24 to determine if the sediments are considered characteristic hazardous wastes.

Record Keeping:

The following "Bypass Report" is required when stormwater is diverted through the bypass system:

- 1) When a bypass occurs, Taylor Lumber must prepare and submit a report to ODEQ within five days of the event. The report shall describe the date and time of the event, an explanation for why the bypass occurred, the volume of water flowing through the bypass, what measures were taken to correct the bypass overflow, and when emergency response notice was given to the agencies.*
- 2) Taylor Lumber shall sample the bypass flows for the parameters listed in Taylor Lumber's NPDES permit every four hours until the bypass stops and shall submit the samples to their laboratory. The laboratory shall analyze the first and last samples and samples collected every twelve hours after the start of the bypass. Taylor Lumber shall report the results of the laboratory analysis to ODEQ. ODEQ may require additional analysis of the stored samples or if additional sample collection and analysis is required. If the bypass exceeds NPDES limits, Taylor Lumber must comply with the following paragraphs.*

The above record keeping requirements are confusing, because there are already requirements in the NPDES permit for notification and record keeping associated with a bypass. Are the above requirements intended to be modifications to the existing NPDES permit? Do the above requirements supersede the permit? Do the notification and record keeping

requirements in the permit no longer apply? Taylor Lumber respectfully requests that USEPA and DEQ clarify the status of the notification and record keeping requirements of its NPDES permit.

Emergency Response and Posting of Telephone Numbers

The following requirements shall be reflected in the O&M Manual:

Emergency response telephone numbers such as the National Spill Response and the Oregon Spill Response telephone numbers shall be posted near the bypass alarms, within the control room, and in other areas where Taylor Lumber staff will congregate during business hours.

In addition, when bypass flows occur, the City of Sheridan's drinking water facility and the Oregon State Health Division Drinking Water program must be notified. These telephone numbers shall also be posted in prominent locations and accessible to Taylor Lumber staff. Taylor Lumber must also notify local newspaper, radio, and television stations at the time the bypass occurs. Sample results of the bypass shall be reported to the City of Sheridan and the Oregon State Health Division Drinking Water program.

An appendix has been added to the O&M manual that includes the telephone contact list in the event of a bypass. The appendix is also referenced in the appropriate sections of the text.

If you have any questions regarding system operation, feel free to telephone me at (360) 694-2691 or Roland Mueller at (503) 843-2122.

Sincerely,

Maul Foster & Alongi, Inc.



Steven P. Taylor, P.E.

cc: Mike Slater, Lorin McPhillips, and Jennifer Byrne; USEPA
Bryson Twidwell; Oregon Department of Environmental Quality
Vince Gullette, Roland Mueller, Jerry Lauer, Darin Cole; Taylor Lumber
Jerry Hodson and Steve Hill; Miller Nash, Wiener, Hager & Carlsen

**Stormwater Treatment System
Operation & Maintenance Manual
Taylor Lumber & Treating, Inc.**

MFA
December 1, 2000
Revision 1.1

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STORMWATER TREATMENT SYSTEM OPERATION & MAINTENANCE MANUAL

TAYLOR LUMBER & TREATING, INC.

SHERIDAN, OREGON

Prepared for

Taylor Lumber & Treating, Inc.

December 1, 2000

Revision 1.1

Prepared by

Maul Foster & Alongi, Inc.
7223 NE Hazel Dell Avenue, Suite B
Vancouver, WA 98665

Project: #8002.001.014

MFA

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Stormwater Treatment System Operation & Maintenance Manual

The material and data in this document were prepared under the supervision and direction of the undersigned.

Maul Foster & Alongi, Inc.

Christine Clary for
Van McKay, E.I.T.



Exp. rev 6/30/02

Steven P. Taylor
Steven P. Taylor, P.E.

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1 PURPOSE

Maul Foster & Alongi, Inc. (MFA) prepared this document for Taylor Lumber and Treating, Inc. (Taylor Lumber) pursuant to a Consent Decree (Civil Action 93-858-JO) and Administrative Order on Consent (AOC, United States Environmental Protection Agency [USEPA] Docket 10-94-0244-RCRA). The AOC was lodged in federal court on April 11, 1995, and was agreed to by Taylor Lumber and the USEPA.

The AOC requires Taylor Lumber to conduct interim corrective measures (ICMs), the purpose of which is to control or abate threats to human health or the environment from releases of hazardous constituents at the facility, and to prevent or minimize the further spread of releases while long-term remedies are pursued. To the extent feasible, Taylor Lumber intends to pursue ICMs that will result in achieving long-term remedies and meet the waste discharge limitations and monitoring and reporting requirements of its National Pollutant Discharge Elimination System (NPDES) permit issued by the Oregon Department of Environmental Quality (DEQ) on February 22, 1995 (included as Appendix A). Taylor Lumber has historically exceeded the NPDES permit limitations for pentachlorophenol (PCP), arsenic, copper, and zinc.

The basis for the system design and how the system will address USEPA and DEQ's concerns were addressed in the following report: *Interim Corrective Measures (ICM), Stormwater Treatment Plan, Taylor Lumber and Treating, Inc., Sheridan, Oregon, prepared for Taylor Lumber and Treating, Inc., by Maul Foster & Alongi, Inc., October 1, 1997.*

The complete stormwater treatment system (SWTS) design was submitted to USEPA and DEQ on June 14, 2000. The design was subsequently modified as described in a letter to USEPA and DEQ dated August 14, 2000. This operations and maintenance (O&M) manual is for the system as modified in the August 14, 2000 letter. The O&M manual is for use by Taylor Lumber. The O&M manual will be modified as additional equipment is added to the system, or as the system is changed. An amendment form is included in Appendix B to track future changes to the O&M manual.

2 CONVEYANCE SYSTEM

2.1 Description

The conveyance system collects the water from the three drainage areas and transports it to the oil-water separators at the southeastern corner of Taylor Lumber's treating plant.

The conveyance system is designed to have sufficient capacity to handle the additional flow from the treated wood storage area should Taylor Lumber choose to pave the site in the future. The conveyance system is designed to handle a 25-year 24-hour design storm under paved conditions.

2.2 System Components

The system components include stormwater ditches, stormwater drainage piping, french drains, and catch basins. Specific features to be inspected for maintenance include the following:

- The french drain on the north side of the facility
- The french drain on the east side of the facility north of the steam line
- A new catch basin near the dryer
- The french drain on the east side of the facility south of the steam line
- The catch basin-north of the drip pad
- Catch basins 1 (CB1) through 6 (CB6)
- The drainage on north and east sides of the site
- The drainage from the asphalt pad in the northwest corner of the treated pole storage yard down to CB6.

The system components are shown on Drawing 1.

2.3 Operations

Piping and catch basins should passively operate with no adjustments by employees.

2.4 Maintenance

Maintenance of the conveyance system will be consistent with the Surface Water Runoff Inspection and Maintenance Plan (SWRIMP) submitted to the USEPA on March 29, 2000 as part of CERCLA removal actions. The inspection and maintenance identified in this O&M plan is intended to supersede the SWRIMP because it has been updated to include the drainage improvements installed by Taylor Lumber as part of the SWTS.

2.4.1 Inspections

Taylor Lumber will routinely inspect the drainage features identified in Section 2.2 of this plan for the criteria shown in the following table:

Drainage Feature	Inspection
French Drains	<ul style="list-style-type: none">• Proper Operation• Cleanliness• Flow• Visible Contamination
Catch Basins	<ul style="list-style-type: none">• Proper Operation• Cleanliness• Flow• Visible Contamination
Conveyance Piping	<ul style="list-style-type: none">• Proper Operation• Cleanliness• Flow• Visible Contamination
Facility Drainage	<ul style="list-style-type: none">• Improper Runoff• Visible Contamination

The inspector will visually evaluate how each drainage feature compares to the criteria listed in the above table based on the following definitions.

Proper Operation The term Proper Operation is used to describe and evaluate whether the drainage feature or equipment is functioning as it was intended. In the case of a pipe, proper operation would be that water is flowing through the pipe. In the case of a catch basin, proper operation would be that the catch basin is preventing oversized materials

from entering the system, it is collecting water, and it is draining freely. In the case of an oil-water separator, proper operation would be that oil and water are being separated, oil is being retained, and water, without visible contamination, is passing through freely. In the case of a pump, it would be that the pump operates at its approximate flow rate against a given head when activated.

Cleanliness The term Cleanliness is used to describe and evaluate the degree of solids accumulation. A feature is considered clean and requiring no corrective action if the amount of solids in the feature is less than 1/3 the volume of the feature and the solids accumulation does not block or obstruct system flow.

Flow The term Flow is used to describe and evaluate whether water is passing through the drainage feature or equipment. A drainage feature or piece of equipment is considered to have normal flow and require no corrective action when water freely enters the drainage feature or equipment and freely passes through the drainage feature or equipment. A drainage feature is considered to have poor flow and require corrective action when water runs around the drainage feature or accumulates at the drainage feature without passing through the drainage feature. A piece of equipment is considered to have poor flow/no flow if flow does not pass through the piece of equipment when flow is put to it under normal operating conditions.

Visible Contamination The term Visible Contamination is used to describe whether water passing through the feature has an oily sheen, the presence of free phase oil, or floating solids.

Improper Runoff Improper Runoff is a term that is specific to overall site drainage and may or may not be attributed to a specific drainage feature. Improper runoff means that surface water is running off site without being conveyed to Taylor Lumber's stormwater treatment system.

Flow charts showing the specific inspection process and the methods for correcting deficiencies for each type of drainage feature are included in Appendix C.

Results of the inspections will be documented on an inspection checklist included as Appendix D. Taylor Lumber will take steps to correct any deficiencies noted during the inspection as soon as possible.

2.4.2 Inspection Schedule

Taylor Lumber will perform the inspections described in Section 2.4.4 once every two weeks between November 1 and June 30. Taylor Lumber will perform the inspections monthly between July 1 and October 31. An additional dry weather inspection involving pumping water out of the drainage features will be completed as described in Section 2.4.4.

A visual inspection for improper run-off must be conducted daily during heavy storms (greater than 1 inch of precipitation in an hour).

2.4.3 Deficiency Correction

Taylor Lumber will clean the conveyance system features as dictated by the results of the inspections. Any improper runoff from the site, system blockages, or visible contamination will be addressed immediately. Per Taylor Lumber's NPDES permit, deficiencies which may endanger health or the environment must be corrected within 24 hours of being identified. If a repair or deficiency which may endanger health or the environment requires more than 24 hours to correct, Taylor Lumber must report it to the DEQ and USEPA as soon as possible and seek verbal approval for a longer correction period from DEQ. Taylor Lumber must follow up on requests for a longer correction period in writing and complete corrections within the period agreed to with DEQ. Taylor Lumber will document all corrective actions taken.

2.4.4 Preventive Maintenance

Generally, maintenance activities related to the drainage features covered by this plan will be performed as indicated by the results of the inspections (i.e., improper flow will be corrected as soon as possible after being noted during an inspection). As an additional preventive maintenance measure, Taylor Lumber will annually test the french drain system and inspect other features.

The annual test and inspection will be performed near the end of the summer on a dry day, before the beginning of the rainy season. The annual test and inspection will occur no later than August 30 of each year. French drains will be tested by adding water to them and observing the flow at the clean outs, catch basins, oil/water separators, and outfalls. Improper flow will be corrected at this time. In conjunction with this test, each drainage feature (i.e., catch basins and piping) will be pumped out and inspected. If solids have accumulated in the drainage feature they will be removed.

The annual test and inspection will be preventative and not replace maintenance required by the results of regular inspections (i.e., drainage features may be cleaned more than once a year, depending upon the results of regular inspections.)

2.4.5 Disposal

Solids, debris, and water removed during cleaning operations will be immediately placed into containers. Solids will be allowed to settle out, and the water will be decanted and discharged through the stormwater system.

Solids and debris will be profiled for disposal. Solid waste and hazardous waste will be shipped offsite for disposal at a facility permitted to receive the respective waste. Solids which are not considered solid waste or hazardous waste will be used for fill onsite in the drainage area from which they originated.

2.4.6 Recordkeeping

Taylor Lumber will retain all records of inspections, repairs, and preventive maintenance activities for three years.

3 OIL-WATER SEPARATION AND WET WELL SYSTEM

3.1 Description

The oil-water separator and wet well system begins after the catch basin, CB6, and ends at the inlet to the storage system. The oil-water separator has a dual purpose. The first purpose is to prevent separate phase hydrocarbons from leaving the site via stormwater. The second purpose is to protect the SWTS from separate phase hydrocarbons that could foul subsequent filtration components (e.g., activated carbon).

The oil-water separator system is sized to handle the majority of a 25-year 24-hour design storm. There is a 24-inch HDPE line which goes directly from CB6 to the wet well. The 24-inch line is designed to convey flow if the separators become backed up or their capacity (approximately 2,200 gpm) is exceeded.

The wet well houses two vertical shaft centrifugal pumps. The two pumps are turned on and off by floats in the wet well. Under normal conditions the primary pump is all that is needed. There are four floats in the wet well.

3.2 System Components

Manufacturers' documentation for the oil-water separator and wet well system components are included in Appendix E. A plan view of the SWTS treatment equipment is included as Drawing 2. A process instrumentation diagram showing how the components relate to the entire SWTS is included as Drawing 3.

The system components include the following:

- Two Utility Vault 812-2-CPS coalescing oil-water separators
- The 12-foot diameter concrete wet well
- Two vertical shaft centrifugal pumps
- Four floats

- Control panel (pump start/stop)
- Piping and valves between the wet well and the storage tank.

3.3 Operations

The oil-water separator system is a passive system and requires no adjustments from employees.

The wet well houses two vertical shaft centrifugal pumps. The two pumps are turned on and off by floats in the wet well. Under normal conditions one pump is all that is needed. There are four floats in the wet well.

The floats perform the following functions:

- The lowest float turns the pumps off.
- The second to the lowest float turns on the primary pump.
- The second to the highest float turns on the secondary pump (at this point the primary pump is not keeping up with runoff).
- The highest float activates a high level alarm and indicates that stormwater is bypassing the treatment system.

From the wet well the duplex pump system discharges to the storage tank. Stormwater is pumped into storage at varying rates depending on the flow into the conveyance system. The primary pump (WP-1) is designed to pump at a flow rate of approximately 1,000 gpm. The secondary pump (WP-2) is designed to pump at a flow rate of approximately 3,700 gpm. The control panel for the wet well pumps has three settings (e.g., hand, off, auto) for each pump. The hand settings are used to turn each pump on regardless of level in the wet well. The hand setting overrides the auto setting. Under normal conditions the wet well pumps will be left in the auto setting so that they are actuated by floats in the wet well.

The butterfly valves downstream of the wet well pumps will normally be open. The valves will only be closed during maintenance of the pumps.

3.4 Maintenance

The oil-water separators and wet well will be inspected in a similar manner as the conveyance system features discussed in section 2 (e.g., using the same criteria).

Cleaning of the oil-water separators and wet well will be performed during dry weather, if possible.

During cleaning, the influent to one oil-water separator will be plugged as the oil-water separators are not valved. The other oil-water separator will be unplugged and available to handle runoff should a storm event occur during cleaning. This process will be repeated for cleaning of the second separator.

Oil recovered from the water surface of the oil-water separators will be processed through Taylor Lumber's on-site process oil recovery system. All water removed from the wet well or oil-water separators shall be transferred to the storage tank for treatment.

Confined-space entry requirements shall be followed at all times when entering the oil-water separator or wet well. Personnel shall not enter any confined space without first testing the atmosphere for potentially dangerous gasses or oxygen deficiencies.

The vertical shaft centrifugal pumps will be maintained as described in Appendix J. The maintenance for these pumps includes the following:

- Greasing the bearings on the smaller pump daily.
- Greasing the bearings on the larger pump weekly.
- Greasing the motor bearings on both pumps every 90 days.
- The bearings and rotary seals will be replaced annually.

3.4.1 Inspections

Taylor Lumber will routinely inspect the drainage features for the criteria shown in the following table consistent with section 2.4.4:

Drainage Feature	Inspection
Oil-water Separators	<ul style="list-style-type: none">• Proper Operation• Cleanliness• Flow• Visible Contamination
Wet Well	<ul style="list-style-type: none">• Proper Operation• Cleanliness• Flow• Visible Contamination

Flow charts showing the specific inspection process and the methods for correcting deficiencies for each type of drainage feature are included in Appendix C.

Similar to the drainage features identified in the table above, Taylor Lumber will also inspect the mechanical equipment for the criteria shown in the following table:

Equipment	Inspection
Vertical shaft centrifugal pumps (WP-1 and WP-2) and associated discharge piping	<ul style="list-style-type: none"> • Proper Operation • Flow • Leakage
Floats	<ul style="list-style-type: none"> • Proper Operation
Control panel	<ul style="list-style-type: none"> • Hand/Off/Auto
Valves	<ul style="list-style-type: none"> • Proper Operation • Open/Closed • Flow • Leakage

The inspector will visually evaluate how each piece of equipment compares to the criteria listed in the above table based on the definitions described previously and below:

Proper Operation The term Proper Operation is used to describe and evaluate whether the drainage feature or equipment is functioning as it was intended. In the case of a pump, it would be that the pump operates at its approximate flow rate against a given head when activated. In the case of a float, it would be that the float, when inverted, triggers the desired result (e.g., turns one pump on, turns one pump off).

Leakage The term Leakage is used to describe and evaluate whether a piece of equipment is leaking untreated stormwater.

Results of the inspections will be documented on an inspection checklist included as Appendix D. Taylor Lumber will take steps to correct any deficiencies noted during the inspection as soon as possible.

3.4.2 Inspection Schedule

Taylor Lumber will perform the drainage feature and equipment inspections described in Section 3.4.1 once every week between November 1 and June 30. Taylor Lumber will

perform drainage feature and equipment inspections monthly between July 1 and October 31.

The operation of the vertical shaft centrifugal pumps will be checked daily during rain events. An inspection of the oil-water separators must be conducted daily during heavy storms (greater than 1 inch of precipitation in an hour).

Solids accumulation in the wet well and the oil water separator will be measured once a month. The depth of solids will be checked in the three chambers of each oil water separator using a gauging rod. The depth of solids in the wet well will be evaluated by manually turning the smaller wet well pump on and pumping the water down to the level of the pump intake. A visual observation will then be made as to whether solids are building up enough to affect the flow of water to the pumps. Gauging with a rod or other device is impractical within the pump house. During the annual inspection the pump house will be removed and the wet well evacuated for a more accurate measurement of solids accumulation.

An additional dry weather inspection involving pumping water out of the drainage features will be completed as described in Section 3.4.4.

3.4.3 Deficiency Correction

Taylor Lumber will clean the drainage features as dictated by the results of the inspections. Any system blockages, visible contamination, or malfunctioning equipment will be addressed immediately. Per Taylor Lumber's NPDES permit, deficiencies which may endanger health or the environment must be corrected within 24 hours of being identified. If a repair or deficiency which may endanger health or the environment requires more than 24 hours to correct, Taylor Lumber must report it to the DEQ and USEPA as soon as possible and seek verbal approval for a longer correction period from DEQ. Taylor Lumber must follow up on requests for a longer correction period in writing and complete corrections within the period agreed to with DEQ. Taylor Lumber will document all corrective actions taken.

3.4.4 Preventive Maintenance

Generally, maintenance activities related to the drainage features and equipment covered by this plan will be performed as indicated by the results of the inspections (i.e., improper flow will be corrected as soon as possible after being noted during an inspection) or as part of scheduled maintenance as described in Appendix J. An annual inspection will be performed near the end of the summer on a dry day, before the beginning of the rainy season. The annual inspection will occur no later than August 30 of each year. As part of the inspection, each drainage feature (e.g., oil-water separators, wet well) will be pumped

out and inspected. If solids have accumulated in the drainage feature, they will be removed. Any annual maintenance recommended by the wet well pump manufacturer will be completed at this time, as well.

Currently, the valves used by Taylor Lumber do not require lubrication to operate properly. The stems on some of the valves are occasionally greased to aid in the turning of the valve handles. A stem will be greased if the valve handle becomes difficult to operate, as dictated by inspections.

The annual inspection will be preventative, and not replace maintenance required by the results of regular inspections.

3.4.5 Disposal

Solids, debris, and water removed during cleaning operations will be immediately placed into containers. Solids will be allowed to settle out, and the water will be decanted and discharged through the stormwater system.

Solids and debris will be profiled for disposal. Solid waste and hazardous waste will be shipped offsite for disposal at a facility permitted to receive the respective waste. Solids which are not considered solid waste or hazardous waste will be used for fill onsite in the drainage area from which they originated.

3.4.6 Recordkeeping

Taylor Lumber will retain all records of inspections, repairs, and preventive maintenance activities for three years.

3.5 Alarms

The wet well is equipped with an overflow to prevent site flooding and property damage in the event that the pumps fail or the design storm is exceeded. In the event that the water level in the wet well reaches the level of the overflow it will actuate a float that activates a strobe light mounted on top of the sedimentation tanks. The light is visible, night or day, from most locations at the treating plant.

Engineers, plant personnel, and site security have been instructed to notify the treating plant maintenance supervisor in the event the alarm is activated. The treating plant supervisor or his designated representative will then determine the cause of the alarm and remedy it if possible. If it is determined that untreated stormwater was discharged via an overflow to the off-site drainage ditch, the maintenance supervisor or his designated

representative will notify the treating plant operations officer, his designated representative, or in-house legal counsel.

Upon confirmation that untreated stormwater has been discharged via an overflow to the off-site drainage ditch, the treating plant operations officer, his designated representative, or legal counsel will complete the notification requirements identified in the NPDES permit in Appendix A. In the event of a bypass, Taylor Lumber's treating plant operations officer, his designated representative, or legal counsel will also notify the following:

- The City of Sheridan's Drinking Water Facility
- The Oregon State Health Division Drinking Water Program
- The City of Sheridan newspaper

The above numbers will be posted near the bypass alarm, within the control room, and in other areas where employees congregate along with the National Spill Response and Oregon Spill Response numbers. The posting is included in Appendix L.

4 STORAGE SYSTEM

4.1 Description

The storage system consists of an above ground, factory coated, bolted steel, open top tank. The tank has a nominal capacity of 500,000 gallons. Erection drawings for the tank will be included in Appendix F after the tank is installed during September 2000. Tank specifications and the maintenance manual provided by the manufacturer are included in Appendix F.

The storage system is only to be used as a detention system. Water will only stay in the storage tank as long as it takes to get treated. The storage tank, in conjunction with the sedimentation system, is configured to contain a 25-year 24-hour storm. Floats in the storage tank activate transfer pumps which transfer water from the storage system to the sedimentation system. These floats are considered part of the sedimentation system and are therefore addressed in Section 5.

4.2 System Components

The system components include the following:

- 500,000 gallon storage tank

4.3 Operations

The storage tank is a passive system and requires no adjustments from employees. If a storm exceeds a 25-year 24-hour event, or if the SWTS is not functioning properly, water may bypass the storage tank and discharge directly to the SWTS outfall without being treated. The storage tank is equipped with the following inlet and outlets:

- Inlet from the wet well system (valves are normally open)
- Outlet to the sedimentation system transfer pumps (valves are normally open)
- Overflow to the SWTS outfall

- Drain (valve is normally closed)
- Inlet from the granular activated carbon backwash system (valve is normally closed)
- Manway (normally bolted closed)

4.4 Maintenance

The storage tank will be maintained as described in the manufacturer's maintenance manual included in Appendix F. The text of the manufacturer's recommended maintenance is not repeated here because of the length. The tank manufacturer recommends an annual inspection and servicing of the following:

- Shell seams
- Deck Structure
- Exterior Corrosion
- Tank Flanges, Nozzles, Manways, Etc.

The annual tank inspection and servicing recommended by the tank manufacturer will be completed as part of the annual inspection described in 4.4.4. The annual tank inspection and servicing recommended by the tank manufacturer is included in the maintenance schedule in Appendix J.

Maintenance, in addition to that recommended by the manufacturer, is described in the following sections.

4.4.1 Inspections

Taylor Lumber will routinely inspect the following equipment for the criteria shown in the following table:

Equipment	Inspection
500,000 gallon storage tank	<ul style="list-style-type: none"> • Proper Operation • Leakage
Valves	<ul style="list-style-type: none"> • Proper Operation • Open/Closed • Flow • Leakage

Results of the inspections will be documented on an inspection checklist included as Appendix D. Taylor Lumber will take steps as soon as possible to correct any deficiencies noted during the inspection.

4.4.2 Inspection Schedule

At a minimum, Taylor Lumber will perform equipment inspections once every week between November 1 and June 30. Taylor Lumber will perform equipment inspections monthly between July 1 and October 31. An additional dry weather inspection involving pumping water out of the storage tank will be completed as described in Section 4.4.4.

Solids accumulation in the 500,000 gallon storage tank will be measured monthly between November 1 and June 30. The depth of solids in the tank will be completed using either a sludge measuring optical gauge (such as the one manufactured by Orenco Systems; see Appendix F) or a gauging rod whichever is determined to be more effective.

4.4.3 Deficiency Correction

Per Taylor Lumber's NPDES permit, deficiencies which may endanger health or the environment must be corrected within 24 hours of being identified. If a repair or deficiency which may endanger health or the environment requires more than 24 hours to correct, Taylor Lumber must report it to the DEQ and USEPA as soon as possible and seek verbal approval for a longer correction period from DEQ. Taylor Lumber must follow up on requests for a longer correction period in writing and complete corrections within the period agreed to with DEQ.. Taylor Lumber will document all corrective actions taken.

4.4.4 Preventive Maintenance

Generally, maintenance activities related to the drainage features and equipment covered by this plan will be performed as indicated by the results of the inspections or as recommended by the manufacturer.

An annual inspection will be performed on a dry day near the end of the summer, before the beginning of the rainy season. The annual inspection will occur no later than August 30 of each year. As part of this inspection, the storage tank will be pumped out and inspected. If solids have accumulated in the storage tank they will be removed. The accumulation of solids in the storage tank will be evaluated monthly as described in Section 4.4.2. It is anticipated that solids will only have to be removed from the storage tank once a year concurrent with the dry weather inspection.

Solids that accumulate in the storage tank will either be pumped to the filter press for dewatering or physically removed by Taylor Lumber personnel and equipment. If the solids are not pumped to the filter press for dewatering, the water in the storage tank will be pumped down as far as possible and treated through the SWTS. The solids will then be allowed to dry in the tank prior to removal. Subsequent to removal the solids will be handled as described in Section 4.4.5.

The annual inspection will be preventative and not replace maintenance required by the results of regular inspections or as recommended by the manufacturer in Appendix F.

Currently, the valves used by Taylor Lumber do not require lubrication to operate properly. The stems on some of the valves are occasionally greased to aid in the turning of the valve handles. A stem will be greased if the valve handle becomes difficult to operate, as dictated by inspections.

4.4.5 Disposal

Solids, debris, and water removed during cleaning operations will be immediately placed into containers. Solids will be allowed to settle out, and the water will be decanted and discharged through the stormwater system.

Solids and debris will be profiled for disposal. Solid waste and hazardous waste will be shipped offsite for disposal at a facility permitted to receive the respective waste. Solids which are not considered solid waste or hazardous waste will be used for fill on-site in the drainage area from which they originated.

4.4.6 Recordkeeping

Taylor Lumber will retain all records of inspections, repairs, and preventive maintenance activities for three years.

4.5 Alarms

The storage tank is equipped with an overflow to prevent site flooding and property damage in the event that pumps fail or the design storm is exceeded. In the event that the water level in the storage tank reaches the level of the overflow it will actuate a float that activates a strobe light mounted on top of the sedimentation tanks. The light is visible, night or day, from most locations at the treating plant.

Engineers, plant personnel, and site security have been instructed to notify the treating plant maintenance supervisor in the event the alarm is activated. The treating plant

supervisor or his designated representative will then determine the cause of the alarm and remedy it if possible. If it is determined that untreated stormwater was discharged via an overflow to the off-site drainage ditch, the maintenance supervisor or his designated representative will notify the treating plant operations officer, his designated representative, or in-house legal counsel.

Upon confirmation that untreated stormwater has been discharged via an overflow to the off-site drainage ditch, the treating plant operations officer, his designated representative, or legal counsel will complete the notification requirements identified in the NPDES permit in Appendix A. In the event of a bypass, Taylor Lumber's treating plant operations officer, his designated representative, or legal counsel will also notify the following:

- The City of Sheridan's Drinking Water Facility
- The Oregon State Health Division Drinking Water Program
- The City of Sheridan newspaper

The above numbers will be posted near the bypass alarm, within the control room, and in other areas where employees congregate along with the National Spill Response and Oregon Spill Response numbers. The posting is included in Appendix L.

5 SEDIMENTATION SYSTEM

5.1 Description

The sedimentation system begins at the outlet pipe from the storage tank and ends at the inlet to the surge tank. The sedimentation system consists of two transfer pumps, two chemical mix tanks, four cone bottom sedimentation tanks, and a sludge handling system. It is designed to remove total suspended solids (TSS) and prevent subsequent fouling of treating equipment, especially the granular activated carbon (GAC) filters. The sedimentation tanks and internal weirs were manufactured by Taylor Lumber. The tanks and weirs are of welded steel construction.

In the first tank, coagulant is added to neutralize the charges on the suspended particles. A precipitant may be added to neutralize the charges of the dissolved metals. In the second tank, a polymer is added that helps solids bind to each other to form large floc particles. Water then overflows into four sedimentation tanks where the floc will be allowed to settle out.

5.2 System Components

Manufacturer's documentation for the sedimentation system components are included in Appendix G, as available. A plan view of the SWTS treatment equipment is included as Drawing 2. A process instrumentation diagram showing how the components relate to the entire SWTS is included as Drawing 3.

The system components include the following:

- Two transfer pumps
- Rapid mix tank and mixer
- Slow mix tank and mixer
- Chemical containers and associated metering pumps
- Sedimentation tanks

- Three floats in the storage tank
- Transfer pump control panel (pump start/stop)
- Rapid mixer control panel (mixer start/stop)
- Slow mixer control panel (mixer start/stop)
- Filter press and sludge pump
- Piping and valves between the storage tank and the surge tank.

5.3 Operations

5.3.1 Transfer pumps

Flow is regulated by pressure regulating valves located downstream of each transfer pump. The pressure regulating valves will open and close as necessary to apply steady backpressure to the pumps so that they operate within their pump curve at a set flowrate. The smaller transfer pump (TP1) is set to operate at 250 gpm. The larger transfer pump (TP2) is set to operate at 1,000 gpm (see pump curves included in Appendix G). Each pump is activated by a float switch located in the storage tank. The smaller transfer pump is activated when approximately 1 foot of water has accumulated above the invert elevation of the outlet. The larger pump is activated when the volume in the storage tank reaches approximately 400,000 gallons.

The control panel for the transfer pumps has three settings (e.g., hand, off, auto) for each pump. The hand settings are used to turn each pump on regardless of water level in the storage tank. The hand setting overrides the auto settings. Under normal conditions the transfer pumps will be left in the auto settings so that they are actuated by floats in the storage tank.

5.3.2 Rapid mix tank

The chemical manufacturer has suggested that approximately 10 minutes of mixing be provided for the coagulant and precipitant (if used). The coagulant and precipitant are injected at the inlet to the rapid mix tank. The rapid mix tank has a capacity of approximately 7,500 gallons. At a flow rate of 1,000 gpm the tank provides approximately 7.5 minutes of mix time. At a flow rate of 250 gpm the tank provides approximately 30 minutes of mix time. The coagulant and stormwater are rapidly mixed

within the tank to form "pin floc." Rapid mixing is completed using a mixer mounted on top of the tank with impellers attached to a shaft which extends into the tank.

The control panel for the mixer has three settings (e.g., hand, off, auto). The hand setting turns the mixer on regardless of whether the transfer pumps are on. The hand setting overrides the auto setting. The auto setting is configured to activate the mixer when the transfer pumps come on. It will be determined after operational data is available if the mixers need to be left on all the time (e.g., hand setting) or only when water is being transferred from the storage tank (e.g., auto setting).

5.3.3 Slow mix tank

Water is gently mixed in the slow mix tank so that the polymer and resulting floc are not sheared. For the polymer, the chemical manufacturer suggested that 3 to 5 minutes of mix time be provided. The polymer is injected at the inlet of the slow mix tank. The polymer mix tank has a capacity of approximately 4,250 gallons. At a flow rate of 1,000 gpm the tank provides approximately 4 minutes of mix time and at 250 gpm the tank provides approximately 17 minutes of mix time. Mixing is completed using a mixer mounted on top of the tank with impellers attached to a shaft which extends into the tank.

The control panel for the mixer has three settings (e.g., hand, off, auto). The hand setting turns the mixer on regardless of whether the transfer pumps are on. The hand setting overrides the auto setting. The auto setting will be configured to activate the mixer when the transfer pumps come on. It will be determined after operational data is available if the mixers need to be left on all the time (e.g., hand setting) or only when water is being transferred from the storage tank (e.g., auto setting).

5.3.4 Chemical storage and metering pumps

Chemicals and metering pumps will be stored near the sedimentation tanks. The final location has yet to be determined. Coagulant will initially be added to the stormwater at a rate of approximately 150 mg/L (ppm). The material safety data sheets (MSDS) for the coagulant and other water treatment chemicals are included in Appendix G. The precipitant, if used, will be added at a rate equal to approximately 10 times the combined metals concentrations. The precipitant is initially to be added at a rate of approximately 10 to 30 mg/L based on a combined metals concentration of 1 to 3 mg/L. The polymer will be added at a rate of approximately 1 to 5 mg/L. The chemical dosages may be adjusted in the field after operational data is available to minimize chemical usage and reduce chemical costs.

The control panel for the metering pumps has three settings (e.g., hand, off, auto). The hand setting turns the metering pumps on regardless of whether the transfer pumps are

on. The hand setting overrides the auto setting. Under normal conditions the control panel will be left in the auto setting so that the metering pumps only come on when the transfer pumps are on.

The coagulant is a sulfide based chemical. If the water chemistry becomes acidic (pH between 5 and 6), hydrogen sulfide gas may become a nuisance. The coagulant and precipitant, if used, tend to lower the pH to acidic conditions. To counteract this effect, a caustic solution will be added to the first mix tank, as necessary, to maintain a pH between 7.5 and 8. The necessity of adjusting the pH will be based on pH monitoring completed after SWTS startup. Metering of caustic will be completed similar to the process described above for the coagulant and polymer.

5.3.5 Sedimentation tanks

The sedimentation tanks are configured so that flow can be divided into two treatment trains (each train being a series of two tanks), or the flow can be divided into four tanks so that equal flow enters each tank. The normal operating configuration will be determined once operational data is available.

The water and flocculated particles are introduced near the bottom of the sedimentation tanks. Water and floc travel up through each tank to the outlet structure. As smaller floc enters the tank, it rises and comes into contact with larger floc. A zone is created within the tank where smaller particles become larger by binding with other floc particles that are settling out. This zone is known as a sludge blanket. As this sludge blanket is formed it acts as a filter that prevents small floc from passing through it. The larger floc settle to the bottom of each tank.

5.3.6 Sludge handling system

Floc that settles out in the sedimentation tank and becomes sludge will be pumped out of the bottom of the sedimentation tank and directly to the filter press. The sludge transfer pump is manually activated by Taylor Lumber personnel using a simple start/stop control panel. The frequency of sludge transfer pump operation will be determined once operational data is available. The pump will run until the volume of the press is filled, at which point the press turns the pump off and begins to press the sludge. Once the sludge is pressed, the unit shuts itself off and signals that it is ready to be emptied. An operator opens the press and cleans off the filter plates into a bin beneath the plates. The filter press is then ready to begin its next cycle.

The filter press will be housed in a covered area. The bin beneath the press will be equipped with a conveyor belt which will transfer the filter cake to a roll off container. Filter cake will be profiled for disposal once operation of the SWTS begins.

MFA presented the expected sludge quantities to a number of filter press manufacturers and it was determined that a 10 cubic foot plate and frame filter press should be capable of handling the sludge volume throughout the year. The actual sludge characteristics, as far as solids content and quantity, will be determined once operational data is available. In the winter months the filter press may have to complete three cycles a day to process up to 30 cubic feet. In the summer months, once sludge remaining in the sedimentation tank is treated, the filter press may not be used at all.

5.4 Maintenance

5.4.1 Transfer pumps

Scheduled maintenance will be performed on the pumps as described in Appendix J. Scheduled maintenance includes greasing the bearings on the small transfer pump monthly and greasing the bearings on the large transfer pump every 90 days.

MSDS for lubricants and grease used on the SWTS are included in Appendix K.

5.4.2 Rapid mix tank

Maintenance of the rapid mix tank will be based on the results of weekly inspections during the rainy season, monthly inspections during the dry season, and an annual internal inspection as described in section 5.4.10. During the annual inspection the inside of the tank will be visually inspected for signs of corrosion and deterioration. Scheduled maintenance for the mixer is described in Appendix J. Scheduled maintenance consists of the following:

- Checking the oil level in the gear boxes daily.
- Greasing the bearings monthly.
- Resealing and changing the oil and bearings annually.

5.4.3 Slow mix tank

Maintenance of the slow mix tank will be based on the results of weekly inspections during the rainy season, monthly inspections during the dry season, and an annual internal inspection as described in section 5.4.10. During the annual inspection the inside

of the tank will be visually inspected for signs of corrosion and deterioration. Scheduled maintenance for the mixer is described in Appendix J. Scheduled maintenance consists of the following:

- Checking the oil level in the gear boxes daily.
- Greasing the bearings monthly.
- Resealing and changing the oil and bearings annually.

5.4.4 Chemical storage and metering pumps

Chemicals will be stored and protected as recommended by the chemical supplier. The MSDS forms for the proposed chemicals are included in Appendix K. Manufacturer's documentation for the metering pumps is included in Appendix G..

Scheduled maintenance related to the chemical storage is included in Appendix J and consists of checking the level of chemical daily and making up the polymer as necessary.

5.4.5 Sedimentation tanks

Maintenance of the sedimentation tanks will be based on the results of weekly inspections during the rainy season, monthly inspections during the dry season, and an annual internal inspection as described in section 5.4.10. During the annual inspection the inside of each tank will be visually inspected for signs of corrosion and deterioration.

Sludge that accumulates in the sedimentation tanks will be routinely pumped off the bottom of each tank to the sludge handling system (filter press). The frequency of sludge transfer from each tank will be determined based on the results of the inspections described in Section 5.4.8.

5.4.6 Sludge handling system

The filter press will be maintained as described in the manufacturer's maintenance manual in Appendix G.. Filter press maintenance will include replacing the filter fabric, as needed, and changing the hydraulic oil and oil filter once a year.

5.4.7 Inspections

Taylor Lumber will routinely inspect the following equipment for the criteria shown in the following table:

Equipment	Inspection
Transfer pumps TP-1 and TP-2	<ul style="list-style-type: none">• Proper Operation• Flow• Leakage
Floats in storage tank	<ul style="list-style-type: none">• Proper Operation
Mixers (M-1 and M-2)	<ul style="list-style-type: none">• Proper Operation
Metering pumps	<ul style="list-style-type: none">• Proper Operation• Flow• Leakage
Tanks (Sedimentation and mix)	<ul style="list-style-type: none">• Proper Operation• Flow• Leakage
Filter Press	<ul style="list-style-type: none">• Proper Operation• Leakage
Control panels	<ul style="list-style-type: none">• Hand/Off/Auto
Valves	<ul style="list-style-type: none">• Proper Operation• Open/Closed• Flow• Leakage

Results of the inspections will be documented on an inspection checklist included in Appendix D. Taylor Lumber will take steps, as soon as possible, to correct any deficiencies noted during the inspection.

5.4.8 Inspection Schedule

At a minimum, Taylor Lumber will perform equipment inspections once every week between November 1 and June 30. Taylor Lumber will perform equipment inspections monthly between July 1 and October 31. An additional dry weather inspection involving pumping water out of the storage tank will be completed as described in Section 5.4.10.

Exceptions to the above schedule include the following:

- TP-1 and TP-2 will be inspected daily between November 1 and June 30.
- The mixers, chemical storage tanks, and chemical metering pumps will be inspected daily between November 1 and June 30.

At a minimum, Taylor Lumber will gauge the depth of solids in each of the sedimentation tanks once a week between November 1 and June 30. The depth of solids will be measured using a sludge measuring optical gauge (see Appendix F) or ports located near the tops of the cones of each tank.

5.4.9 Deficiency Correction

Per Taylor Lumber's NPDES permit, deficiencies which may endanger health or the environment must be corrected within 24 hours of being identified. If a repair or deficiency which may endanger health or the environment requires more than 24 hours to correct, Taylor Lumber must report it to the DEQ and USEPA as soon as possible and seek verbal approval for a longer correction period from DEQ. Taylor Lumber must follow up on requests for a longer correction period in writing and complete corrections within the period agreed to with DEQ.. Taylor Lumber will document all corrective actions taken.

5.4.10 Preventive Maintenance

Generally, maintenance activities related to the equipment covered by this plan will be performed as indicated by the results of the inspections or as recommended by the manufacturer.

An annual inspection will be performed on a dry day near the end of the summer, before the beginning of the rainy season. The annual inspection will occur no later than August 30 of each year. As part of this inspection, the mix tank and sedimentation tanks will be pumped out and inspected. If solids have accumulated in the tanks they will be removed. The conditions of the tanks will be noted. Significant corrosion or deterioration will be corrected as necessary.

The annual inspection will be preventative, and not replace maintenance required by the results of regular inspections or as recommended by the manufacturer in Appendix G.

Currently, the valves used by Taylor Lumber do not require lubrication to operate properly. The stems on some of the valves are occasionally greased to aid in the turning of the valve handles. A stem will be greased if the valve handle becomes difficult to operate, as dictated by inspections.

5.4.11 Disposal

Solids, debris, and water removed during cleaning operations will be immediately placed into containers. Solids will be allowed to settle out and the water will be decanted and discharged to the storage tank for future treatment.

Solids and debris will be profiled for disposal. Solid waste and hazardous waste will be shipped offsite for disposal at a facility permitted to receive the respective waste. Solids which are not considered solid waste or hazardous waste will be used for fill onsite in the drainage area from which they originated.

5.4.12 Recordkeeping

Taylor Lumber will retain all records of inspections, repairs, and preventive maintenance activities for three years.

6 FILTRATION SYSTEM

6.1 Description

As water overflows the sedimentation tank it flows into a surge tank. The surge tank has a capacity of approximately 5,800 gallons above its cone. The surge tank has three floats which activate a series of transfer pumps. The pumps transfer water from the surge tank through a series of five bag filter vessels and then through the GAC vessels.

6.2 System Components

Manufacturer's documentation for the filtration system components are included in Appendix H, as available. A plan view of the SWTS treatment equipment is included as Drawing 2. A process instrumentation diagram showing how the components relate to the entire SWTS is included as Drawing 3.

The system components include the following:

- Surge tank
- Two transfer pumps (TP3 and TP4)
- Five bag filter vessels
- Three floats

6.3 Operations

The transfer pumps are regulated by pressure regulating valves located downstream of each transfer pump. The pressure regulating valves open and close as necessary to apply steady backpressure to the pumps so that they operate within their pump curve at a set flowrate. The smaller pump (TP3) will be set to operate at 250 gpm. The larger pump (TP4) will be set to operate at 500 gpm (see Appendix H for pump curves). Each pump will be activated by a float switch located in the surge tank.

The control panel for the transfer pumps has three settings (e.g., hand, off, auto) for each pump. The hand settings are used to turn each pump on regardless of water level in the surge tank. The hand settings override the auto settings. Under normal conditions the transfer pumps will be left in the auto setting so that they are actuated by floats in the surge tank.

The bag filter system is configured so that water initially passes through twelve 100-micron bag filters installed in one vessel. The flow then splits into two trains and water passes through twenty-four 50-micron bag filters installed in two vessels and then twenty-four 25-micron bag filters installed in two vessels. The filtration capability of the system can be modified by inserting bags with other micron ratings, as necessary. If the flow rate is increased to 500 gpm, a bypass line is used to bypass part of the water past the 100-micron filter bag vessel.

6.4 Maintenance

Regular maintenance of the filtration system will include replacing filter bags when they become fouled. Filter bags will be changed out in a vessel when the pressure differential across the vessel reaches approximately 15 psi. The vessels use standard #2 bag filters available from a variety of manufacturers. The maintenance schedule for the filter bags is included in Appendix J.

When changing bag filters the valves before and after the vessel should be closed. This will prevent water from being pumped into the vessel during change out. Replacing bag filters should be attempted during dry weather. Bag filter replacement can be completed during a rain event, if necessary, since there are two redundant filter trains.

Scheduled maintenance will be performed on the pumps as described in Appendix J. Scheduled maintenance includes the following:

- Checking the oil level in the small transfer pump weekly.
- Greasing the bearings on the small transfer pump motor monthly.
- Greasing the bearings on the large transfer pump motor every 90 days.
- Changing the oil in the small transfer pump once a year.

MSDS for lubricants and grease used on the SWTS are included in Appendix K.

6.4.1 Inspections

Taylor Lumber will routinely inspect the following equipment for the criteria shown in the following table:

Equipment	Inspection
Transfer pumps TP-3 and TP-4	<ul style="list-style-type: none">• Proper Operation• Flow• Leakage
Floats in surge tank	<ul style="list-style-type: none">• Proper Operation
Surge tank	<ul style="list-style-type: none">• Proper Operation• Flow• Leakage
Filtration System	<ul style="list-style-type: none">• Proper Operation• Flow• Pressure Differential• Leakage
Control panels	<ul style="list-style-type: none">• Hand/Off/Auto
Valves	<ul style="list-style-type: none">• Proper Operation• Open/Closed• Flow• Leakage

Results of the inspections will be documented on an inspection checklist included in Appendix D. Taylor Lumber will take steps to correct any deficiencies noted during the inspection as soon as possible.

6.4.2 Inspection Schedule

At a minimum, Taylor Lumber will perform equipment inspections once every week between November 1 and June 30. Taylor Lumber will perform equipment inspections monthly between July 1 and October 31.

The exceptions to the above schedule are as follows:

- The pressure on the bag filters will be recorded daily between November 1 and June 30.

6.4.3 Deficiency Correction

Per Taylor Lumber's NPDES permit, deficiencies which may endanger health or the environment must be corrected within 24 hours of being identified. If a repair or deficiency which may endanger health or the environment requires more than 24 hours to correct, Taylor Lumber must report it to the DEQ and USEPA as soon as possible and seek verbal approval for a longer correction period from DEQ. Taylor Lumber must follow up on requests for a longer correction period in writing and complete corrections within the period agreed to with DEQ. Taylor Lumber will document all corrective actions taken.

6.4.4 Preventive Maintenance

Generally, maintenance activities related to the equipment covered by this plan will be performed as indicated by the results of the inspections or as recommended by the manufacturer.

Currently, the valves used by Taylor Lumber do not require lubrication to operate properly. The stems on some of the valves are occasionally greased to aid in the turning of the valve handles. A stem will be greased if the valve handle becomes difficult to operate, as dictated by inspections.

6.4.5 Disposal

Solids, debris, and water removed during cleaning operations will be immediately placed into containers. Solids will be allowed to settle out, and the water will be decanted and discharged through the stormwater system.

Solids and debris will be profiled for disposal. Solid waste and hazardous waste will be shipped offsite for disposal at a facility permitted to receive the respective waste. Solids which are not considered solid waste or hazardous waste will be used for fill onsite in the drainage area from which they originated.

6.4.6 Recordkeeping

Taylor Lumber will retain all records of inspections, repairs, and preventive maintenance activities for three years.

6.5 Alarms

The surge tank is equipped with an overflow to prevent site flooding and property damage in the event that pumps fail or the design storm is exceeded. In the event that the water level in the surge tank reaches the level of the overflow it will actuate a float that activates a strobe light mounted on top of the sedimentation tanks. The light is visible, night or day, from most locations at the treating plant.

Engineers, plant personnel, and site security have been instructed to notify the treating plant maintenance supervisor in the event the alarm is activated. The treating plant supervisor or his designated representative will then determine the cause of the alarm and remedy it if possible. If it is determined that untreated stormwater was discharged via an overflow to the off-site drainage ditch, the maintenance supervisor or his designated representative will notify the treating plant operations officer, his designated representative, or in-house legal counsel.

Upon confirmation that untreated stormwater has been discharged via an overflow to the off-site drainage ditch, the treating plant operations officer, his designated representative, or legal counsel will complete the notification requirements identified in the NPDES permit in Appendix A. In the event of a bypass, Taylor Lumber's treating plant operations officer, his designated representative, or legal counsel will also notify the following:

- The City of Sheridan's Drinking Water Facility
- The Oregon State Health Division Drinking Water Program
- The City of Sheridan newspaper

The above numbers will be posted near the bypass alarm, within the control room, and in other areas where employees congregate along with the National Spill Response and Oregon Spill Response numbers. The posting is included in Appendix L.

7 GRANULAR CARBON ACTIVATED SYSTEM

7.1 Description

The GAC system was constructed by Calgon Carbon (Calgon Model 10). It is a self-contained skid mounted unit. There are two vessels on the unit. Each unit is capable of being filled with 20,000 pounds of granular activated carbon. The operations and maintenance manual provided by Calgon Carbon is included in Appendix I.

7.2 System Components

The system components include the following

- Skid mounted GAC system
- Backflush tank and transfer pump

7.3 Operations

The GAC has a high affinity for pentachlorophenol and other organic constituents associated with the petroleum-based wood treating chemicals used at Taylor Lumber. The units will be operated in series at flowrates of 250 gpm and 500 gpm. At 250 gpm and an inlet concentration of 0.250 ppm pentachlorophenol, it is estimated that less than 3 pounds of carbon will be used per day of use.

The system is configured to be manually backwashed/backflushed (see Appendix I). Backflushing will be done, as necessary, with treated water stored in the backflush tank. The backflush tank will be filled with treated water from the discharge of the GAC system. The water will be held until the GAC system requires backflushing. The need for backflushing will be based on a pressure differential across each GAC vessel consistent with the operations and maintenance manual included in Appendix I.

Backwash will be transferred to the storage tank as necessary. The GAC system is the final treatment step. Treated water is discharged into the SWTS outfall after passing through each vessel.

As part of the purchase of the unit, Calgon Carbon will inspect the system and make sure it is ready for operation. Before filling the vessels, Calgon Carbon will train Taylor Lumber personnel on its operation.

The vessels will be filled with 8x30 mesh granular activated carbon to minimize head loss and fouling of the GAC vessels.

7.4 Maintenance

Scheduled maintenance of the GAC system is described in Appendix J and consists of the following:

- Checking the differential pressure across each bed daily. Backwashing will be completed if pressure reaches 17 psi.
- Actuating the valves on the GAC system once a month.

7.4.1 Inspections

Taylor Lumber will routinely inspect the following equipment for the criteria shown in the following table:

Equipment	Inspection
Skid Mounted GAC system	<ul style="list-style-type: none"> • Proper Operation • Flow • Pressure Differential • Leakage
Backflush Tank and transfer pump	<ul style="list-style-type: none"> • Proper Operation • Flow • Leakage

Results of the inspections will be documented on an inspection checklist included as Appendix D. Taylor Lumber will take steps to correct any deficiencies noted during the inspection as soon as possible.

7.4.2 Inspection Schedule

Taylor Lumber will perform equipment inspections once every week between November 1 and June 30. Taylor Lumber will perform equipment inspections monthly between July 1 and October 31.

7.4.3 Deficiency Correction

Per Taylor Lumber's NPDES permit, deficiencies which may endanger health or the environment must be corrected within 24 hours of being identified. If a repair or deficiency which may endanger health or the environment requires more than 24 hours to correct, Taylor Lumber must report it to the DEQ and USEPA as soon as possible and seek verbal approval for a longer correction period from DEQ. Taylor Lumber must follow up on requests for a longer correction period in writing and complete corrections within the period agreed to with DEQ. Taylor Lumber will document all corrective actions taken.

7.4.4 Preventive Maintenance

Generally, maintenance activities related to equipment covered by this plan will be performed as indicated by the results of the inspections or as recommended by the manufacturer.

7.4.5 Disposal

During operation, samples will be collected at the influent, midpoint, and effluent GAC sampling ports. These samples will be used to monitor for increased organic contaminant concentrations at the midpoint sampling port to indicate when "breakthrough" will occur. Breakthrough is the point when the primary GAC vessel is no longer effectively removing organic contaminants and indicates when the GAC needs to be replaced.

At the point in time that breakthrough is anticipated, based on sampling results, new carbon will be ordered from Calgon Carbon. Spent GAC will be removed by Calgon Carbon and either transported by them to one of their regeneration facilities or placed in containers for disposal by Taylor Lumber.

Whether or not the GAC can be regenerated, or has to be disposed of offsite, will be dependent on waste profiling completed by Taylor Lumber. Waste profiling cannot be completed until the waste (e.g., spent GAC) is produced and characterized.

7.4.6 Recordkeeping

Taylor Lumber will retain all records of inspections, repairs, and preventive maintenance activities for three years.

LIMITATIONS

The services described in this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, not the use of segregated portions of this report.

DRAWINGS

APPENDIX A
NPDES PERMIT

APPENDIX B
O&M PLAN AMENDMENT LOG

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APPENDIX C

**DRAINAGE FEATURE INSPECTION AND CORRECTIVE ACTION
FLOW CHARTS**

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APPENDIX D
INSPECTION CHECKLISTS

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TAYLOR LUMBER & TREATING, INC. - TREATING PLANT
Stormwater Treatment System
Daily Inspection Checklist

Month/Year _____

Feature	Inspection Criteria	Corrective Action Required (Y/N) If Yes, Attach Form																																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
Wet Well Pumps (WWP1 & WWP2)	Proper Operation Flow Leakage																																		
Transfer Pumps (TP1 - TP4)	Proper Operation Flow, Leakage																																		
Mixers (M-1 & M-2)	Proper Operation																																		
Metering Pump (MP1 - MP4)	Proper Operation Flow Leakage																																		
Bag Filter #1 (BF1)	Proper Operation Flow, Leakage Pressure Diff.	Record Pressure Differential																																	
Bag Filter #2 (BF2)	Proper Operation Flow, Leakage Pressure Diff.																																		
Bag Filter #3 (BF3)	Proper Operation Flow, Leakage Pressure Diff.																																		
Bag Filter #4 (BF4)	Proper Operation Flow, Leakage Pressure Diff.																																		
Bag Filter #5 (BF5)	Proper Operation Flow, Leakage Pressure Diff.																																		
Precipitant Drum	Sufficient Chemical, Leakage																																		
Coagulant Drum	Sufficient Chemical, Leakage																																		
Polymer Tank	Sufficient Chemical, Leakage																																		
Inspectors Name		Initial Days inspected																																	

Supervisors Signature _____

Date _____

TAYLOR LUMBER & TREATING, INC. - TREATING PLANT
Stormwater Treatment System
Weekly Inspection Checklist

Month/Year _____

Feature	Inspection Criteria	Corrective Action Required (Y/N) If Yes, Attach Form																															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
North French Drain*	Proper Operation Cleanliness, Flow Visible Contamination																																
East French Drain North Section*	Proper Operation Cleanliness, Flow Visible Contamination																																
East French Drain South Section*	Proper Operation Cleanliness, Flow Visible Contamination																																
Northwest Drainage Ditch West of Drip Pad	Proper Operation Cleanliness, Flow Visible Contamination																																
Dryer & Drip Pad Catch Basins	Proper Operation Cleanliness, Flow Visible Contamination																																
Catch Basins 1 - 6	Proper Operation Cleanliness, Flow Visible Contamination																																
Oil-Water Separators*	Proper Operation Cleanliness, Flow Visible Contamination																																
Wet Well	Proper Operation Cleanliness, Flow Visible Contamination																																
Wet Well Floats	Proper Operation																																
Wet Well Pump Discharge Valves	Proper Operation Open (normally open) Leakage																																
Storage Tank	Proper Operation Leakage																																

TAYLOR LUMBER & TREATING, INC. - TREATING PLANT
 Stormwater Treatment System
 Weekly Inspection Checklist

Month/Year _____

Feature	Inspection Criteria	Corrective Action Required (Y/N) If Yes, Attach Form																																		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
Storage Tank Drain Valve	Proper Operation Closed (normally closed) Leakage																																			
Storage Tank Floats	Proper Operation																																			
Chemical Storage Room	Cleanliness Leakage																																			
Backwash Valve	Proper Operation Closed (normally closed) Leakage																																			
Sedimentation Transfer Pump Discharge Valves	Proper Operation Open (normally open) Leakage																																			
Rapid Mix Tank	Proper Operation Flow Leakage																																			
Slow Mix Tank	Proper Operation Flow Leakage																																			
Filter Press	Proper Operation Leakage																																			
Surge Tank Floats	Proper Operation																																			
Filtration Sys. Transfer Pump Discharge Valves	Proper Operation Open (normally open) Leakage																																			
Backflush Transfer Pump	Proper Operation Flow Leakage																																			

TAYLOR LUMBER & TREATING, INC. - TREATING PLANT
Stormwater Treatment System
Weekly Inspection Checklist

Month/Year _____

Feature	Inspection Criteria	Corrective Action Required (Y/N) If Yes, Attach Form																																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
Backflush Tank	Proper Operation Leakage																																		
Backflush Transfer Pump Discharge Valves	Proper Operation Closed (normally closed) Leakage																																		
GAC Vessel 1 (GAC1)	Proper Operation Flow, Leakage Pressure Diff. (less than 17 psi)	* Record Pressure Difference																																	
GAC Vessel 2 (GAC2)	Proper Operation Flow, Leakage Pressure Diff. (less than 17 psi)																																		
Wet Well Pump Control Panel	Hand / Off / Auto (normally auto)	** Record Setting																																	
Sedimentation Transfer Pump Control Panel	Hand / Off / Auto (normally auto)																																		
Mixer Control Panel	Hand / Off / Auto (normally auto)																																		
Metering Pump Control Panel	Hand / Off / Auto (normally auto)																																		
Filtration Sys. Transfer Pump Control Panel	Hand / Off / Auto (normally auto)																																		
Backflush Transfer Pump Control Panel	Hand / Off / Auto (normally auto)																																		

TAYLOR LUMBER & TREATING, INC. - TREATING PLANT
Stormwater Treatment System
Weekly Inspection Checklist

Month/Year _____

Feature	Inspection Criteria	Corrective Action Required (Y/N) If Yes, Attach Form																															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Sediment Tank 1	Sediment Depth	Record Depth in Feet and Inches																															
Sediment Tank 2	Sediment Depth																																
Sediment Tank 3	Sediment Depth																																
Sediment Tank 4	Sediment Depth																																
Oil-Water Separator 1	Sediment Depth (measure monthly)																																
Oil-Water Separator 2	Sediment Depth (measure monthly)																																
Wet Well	Sediment Depth (measure monthly)																																
Storage Tank	Sediment Depth (measure monthly)																																

Inspector Name _____

	Initial Days inspected																																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	

* Take corrective action if pressure difference is greater than 17 psi

** Record explanation using a corrective action form if setting is other than normal Supervisors Signature _____

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APPENDIX E

**OIL-WATER SEPARATOR AND WET WELL SYSTEM
MANUFACTURER'S DOCUMENTATION**

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APPENDIX F

STORAGE TANK MANUFACTURER'S DOCUMENTATION

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OMEGA ... Your Source for Process Measurement and Control

TEMPERATURE

- Thermocouple, RTD & Thermistor Probes & Assemblies
- Connector Systems and Panels
- Wire: Thermocouple, RTD and Thermistor
- Calibrators and Ice Point References
- Recorders, Controllers and Process Monitors
- Data Acquisition Modules and Data Loggers
- Computer Sensor Interface

PRESSURE/STRAIN

- Transducers
- Strain Gauges
- Load Cells
- Pressure Gauges
- Instrumentation

FLOW

- Rotameters
- Flowmeter Systems
- Air Velocity Indicators
- Turbine/Paddlewheel Systems
- Vortex Meters and Flow Computers

pH

- Electrodes
- Benchtop/Laboratory Meters
- Controllers
- Calibrators/Simulators
- Transmitters

Return Requests/Inquiries

Direct all warranty and repair requests/inquiries to OMEGA Customer Service Department, telephone number (203) 359-1660. Before returning any instrument, please contact the OMEGA Customer Service Department to obtain an authorized return (AR) number. The designated AR number should then be marked on the outside of the return package.

To avoid processing delays, also please be sure to include:

1. Returnee's name, address, and phone number.
2. Model and Serial numbers.
3. Repair instructions.



One Omega Drive, Box 4047
Stamford, Connecticut 06907-0047
(203)359-1660 Telex: 996404 Cable: OMEGA
FAX: (203) 359-7700

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Printed in U.S.A.

M475/076



OMEGA
ENGINEERING, INC.
An OMEGA Group Company



MODELS
LV-40 & LV-50
LIQUID LEVEL
SWITCHES



Operator's Manual



GENERAL DESCRIPTION

Constructed entirely of 316SS, the LV-40 Single Station Level Switch is specifically designed to withstand the effects of a wide range of chemicals. The unit has a maximum operating temperature of 300°F and can be used to meet many level control applications, including medical and water purification requirements. Its small float displacement permits high accuracy and reliability in shallow tanks and reservoirs.

The LV-50 Series Level Switches offer superlative performance and dependability under the most severe operating conditions. The sensor incorporates a larger float displacement and all stainless steel construction for consistent level monitoring in liquids pressurized to a maximum 750 PSI. Ideal for level sensing in chemical plants and systems, models are available for temperatures up to 480°F.

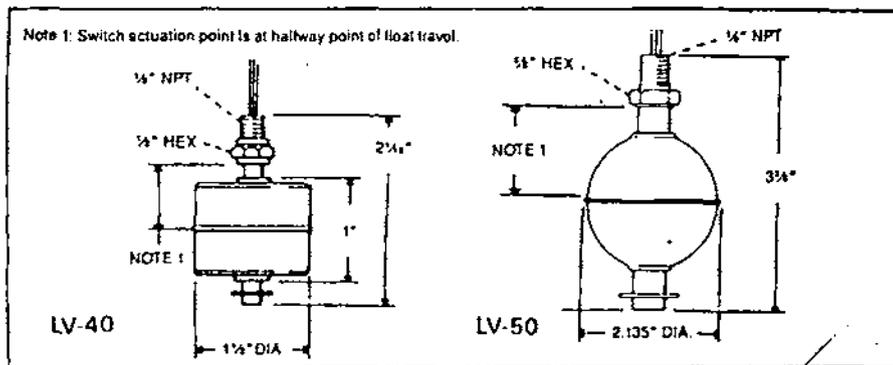
SPECIFICATIONS

STEM MATERIAL:	316SS
FLOAT MATERIAL:	316SS
OPERATING TEMPERATURE:	0° to 300°F; 0° to 480°F for LV-52
PRESSURE RATING:	150 PSI for LV-40; 750 PSI for LV-50 Series
MOUNTING:	1/8" NPT for LV-40; 1/4" NPT for LV-50 Series
SWITCH:	SPST
SWITCH ACTUATION:	Approx. 1/2 the distance from end of stem to mounting, or at halfway point of float travel.
SWITCH RATING:	Models LV-40: 10VA; Models LV-50, LV-52: 20VA; Models LV-51: 100VA
LEAD WIRES:	22 awg 24" polymeric; 18 awg 24" polymeric for LV-50 Series
SPECIFIC GRAVITY OF FLOAT:	LV-40: 62; LV-50: 64

NOTE

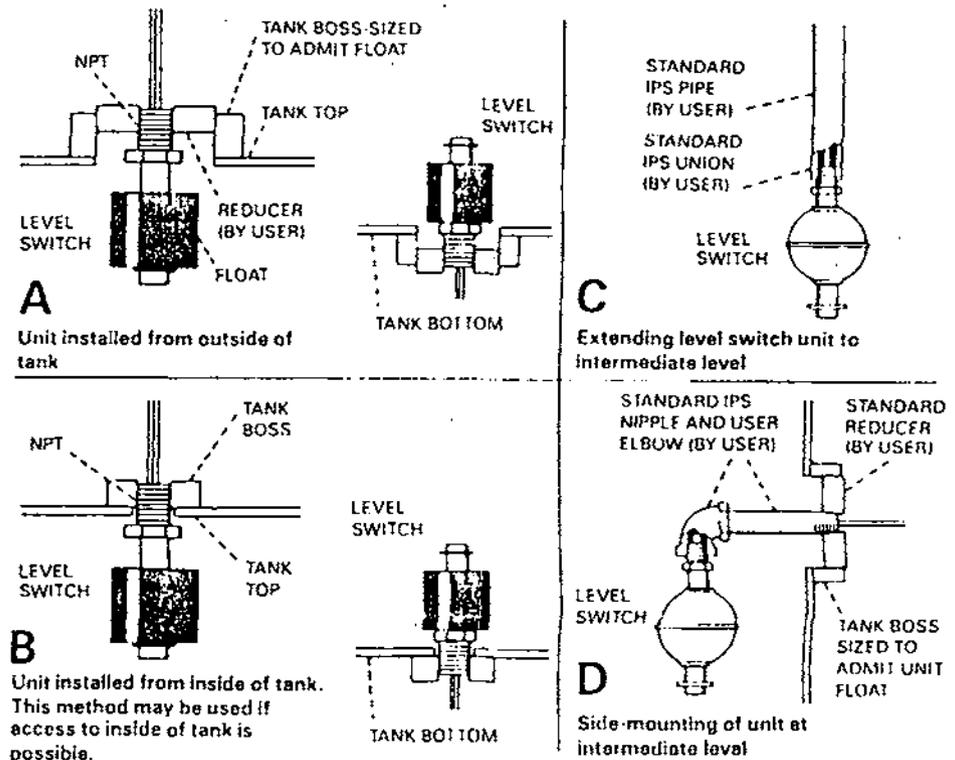
To determine minimum fluid specific gravity, add 0.1 to float specific gravity in clean liquids and 0.3 to float specific gravity in dirty water or viscous liquids.

DIMENSIONS



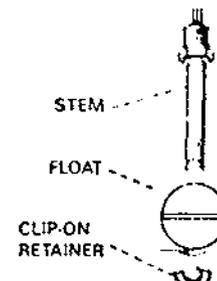
INSTALLATION

Install units vertically in tank top or bottom using Methods A, B, C or D (below).
Note: Units will operate normally inclined up to 30°.

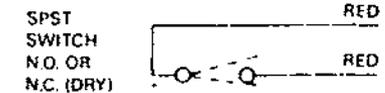


REVERSING SWITCH OPERATION

The switch is user selectable as normally open (N.O.) or normally closed (N.C.) (dry). Simply remove the retaining clip and invert the position of the float. It is not necessary to disturb the installation.



WIRING DIAGRAM



APPENDIX G

**SEDIMENTATION SYSTEM MANUFACTURER'S
DOCUMENTATION**

D. R. SPERRY & CO.

*FILTRATION ENGINEERING
SINCE 1868*

*CUSTOMER: TAYLOR LUMBER
CUST. NO.: J11000-B00
SERIAL NO.: X58623
PRESS NO.: E3276*

*D. R. SPERRY & CO.
112 N. GRANT ST.
N. AURORA, IL 60542*

630-892-4361

E-PRESS ERECTION INSTRUCTIONS

**D. R. SPERRY & COMPANY
112 NORTH GRANT STREET
NORTH AURORA, IL 60542
PHONE: 630 892-4361**

E-PRESS ERECTION

Your Sperry filter press will be shipped assembled, whenever possible, unless specifically requested by you when ordered. Where assembly is required, please adhere to the following instructions:

1. Bolt the stationary head weldment to the floor using appropriate bolts or anchors. The stationary head is the one to which the piping is normally affixed. Tighten the foundation bolts to insure that the position of the weldment will be maintained.
2. Using the bolts supplied with the press, attach the sidebars to the stationary head end. Install only one sidebar at this time.
3. If necessary, install the cylinder, using the bolts provided, into the crosshead. The crosshead is the weldment with the other leg assembly.
4. Attach the sidebar, which was assembled to the stationary head in Step 2, to the appropriate side of the crosshead assembly. Attach the opposite sidebar to the crosshead and stationary head weldment.
5. Bolt the crosshead to the floor using appropriate bolts or anchors. **DO NOT TIGHTEN THESE BOLTS.** Snug them only so that framework has room to expand when in operation.
6. Install the sidebar covers. These are the stainless steel "U" shaped forms. Lower slide head unto sidebars to contact rollers.
7. If provided, install the rod boot over the cylinder rod. Attach the pullback plate to the cylinder rod by threading onto the rod end of the cylinder. Use the bolts provided to attach the pull back plate to the slide head.
8. Attach the hoses from the power unit to the rod and cap end of the cylinder. See the power unit section in this manual to determine which port to use.
9. Install the plates and head connections. The head connections normally thread into the head plate which is installed at the stationary head end. Where a center feed is used, please consult the head connection installation section of this manual.
10. Install the filter media. Where center feed or leakproof plates are provided, an additional manual section is provided to aid in installation

UNLOADING AND POSITIONING OF PRESS IS ACCOMPLISHED BY,
ATTACHING LIFTING BOLTS TO THE CROSSHEAD AND STATIONARY HEAD
ENDS OF THE PRESS. PRESS WILL THEN BE READY TO MOVE.

LIFTING BOLTS TO BE SUPPLIED BY PURCHASER OR MAY BE PURCHASED
FROM D. R. SPERRY & COMPANY.

CONDITIONING OF COMPRESSED AIR
Section CA

D. R. Sperry & Company
112 North Grant Street
North Aurora, IL 60542
Phone: 630 892-4361

CONDITIONING OF COMPRESSED AIR

Raw compressed air direct from an air compressor is unsuitable for most pneumatic and fluidic operations until it has been cleaned, dried, and, if necessary, lubricated. The equipment supplied with your Sperry filter press presumes that the air supplied is clean and dry. If not, conditioning of the air is required.

Once provided to the filter press, the air is passed through a series of baffles in a filter which imparts a high rotational velocity causing most dirt and moisture to separate out from centrifugal force. The contaminants drain down the side of the bowl and collect in a quiet zone below the baffles. The air then passes through the filter to remove any remaining contaminants. The bowl should be drained periodically so check it daily.

The air then passes through a self-relieving regulator which has been factory set for proper filter press operation. Any change to the regulator should be slight. Keep the setting as low as practicable to conserve air. If performance of the filter press changes radically, do not automatically increase air supply, but instead, look for possible causes and correct them.

Where needed, a lubricator has been provided which will inject a fine mist of oil into the air stream to provide lubrication for components down stream. The rate of feed should be about 1 drop of oil for every 20 SCFM of air. The lubricator can be calibrated by supplying it with 100 PSIG at its inlet and discharging its outlet through a 1/16" diameter orifice. This size orifice will pass 3 SCFM and therefore 1 drop of oil every 6-7 minutes should be adequate. Adjust as required.

Use a lightweight pneumatic oil and do not over lubricate. Less oil is actually better than too much oil for most pneumatic operations. If a lubricator was not provided with your equipment, it is unlikely that you need one. Most Sperry pneumatic components for power units are lubricated for life and sealed.

CAUTION: The filter and lubricator bowls are made from a clear polycarbonate. Do not exceed 150 degrees F. Do not expose to solvents or solvent vapors. Clean inside with a non-detergent hand soap or kerosene. Check bowl for craze marks. If found, replace bowl.

HYDRAULIC OIL SYSTEM MAINTENANCE
SECTION HO

D. R. SPERRY & COMPANY
112 NORTH GRANT STREET
NORTH AURORA, IL 60542
PHONE: 630 892-4361

HYDRAULIC OIL MAINTENANCE

The hydraulic power unit which came with your Sperry filter press has been filled with the correct grade of hydraulic oil and properly set for the correct closing force and relief conditions. As a general rule, no adjustments should be required.

It will be necessary to change the oil and oil filter, where provided, on a regular basis. Interval lengths must be determined by application and working environment, however, the following information may be of use when setting up a program.

- A. Always use clean oil and new filters. Never return used oil to the reservoir or reuse a filter. Do not use oil straight from the barrel. Always filter oil before pouring into the reservoir.
- B. Use clean containers, hoses and funnels when transferring oil.
- C. Keep containers of oil tightly sealed.
- D. Inspect filter elements for signs of failure which may indicate a need to decrease time between service intervals
- E. Intake and return lines should be submerged in oil. If not, oil level in reservoir is too low.
- F. Listen for unusual noises or changed in performance. These are indicators of low oil levels, loose suction or return lines, clogged filter elements, or air entrapment.

There are a limited number of tests that the average user can conduct. One simple test is to compare the same grade of clean oil with a sample from the power unit. The power unit sample should be allowed to sit overnight to promote settling of any contaminants. No foam should remain. A severe color change or a change in consistency means change the oil more often! It will always be cheaper to change the oil than replace components.

Avoid the use of phosphate ester base, chlorinated hydrocarbon, water glycol, and water based emulsion oils. This manual contains recommended specifications for hydraulic oil. D. R. Sperry cannot make recommendations as to specific manufacturers of hydraulic oil. A list of "or equal" oils are contained in this section.

(Under normal operating conditions, oil and filter, where provided should be changed after 60 days and every 6 months thereafter.)

HYDRAULIC OIL SPECIFICATIONS

The following oil is used in all Sperry power units except manual pump types:

Minimum viscosity index of 95

Flash point 460 degrees F.

Fire point 475 degrees F.

Viscosity @ 100 degrees F is 300 SUS.

Very good demulsibility, separates readily from water.

HO-68-Z or equals:

Mobile Oil DTE-26

Shell Oil Tellus 68

Sun Oil Suntac 202 WR

Texaco Rando HD-68

BP Oil Energol HLP-68

Gulf Oil Harmony 68 AW (54)

Exxon NUTO H-68 (54)

Citgo A/W hydraulic 68

Arco Duro AW-68

The following oil is used in Sperry manual pump closing devices:

Minimum viscosity index of 89

Flash point 460 degrees F.

Fire point 475 degrees F.

Viscosity @ 100 degrees F. is 100 SUS

Very good demulsibility, separates readily from water

HO-99-Z or equals:

Mobile Oil DTE-11

Amoco Oil Rykon Oil MV

Sun Oil Sunvis 701

Shell Oil Tellus 22

Gulf Oil Harmony 22

When operated in extreme heat or cold, please consult the factory.

FILTER OPERATION AND FILTER OPERATING PROBLEMS

**D. R. SPERRY & COMPANY
112 NORTH GRANT STREET
NORTH AURORA, IL 60542
PHONE: 630 892-4361**

I. **LEAKAGE:**

It is practically impossible to prevent a small amount of leakage between the plates and the frames when handling clear liquids. The leakage is the result of wicking through the filter media. Leakage, resulting from pumping clear water through a filter, is not a cause for alarm. Gradual accumulation of solids will reduce the major portion of the leakage. Special leakproof plates are available to prevent leakage.

High discharge heads on closed delivery presses should be avoided.

Plates and frames of Sperry filter presses are machined to give accurate parallel joint surfaces. Should any joint on a Sperry filter press leak to a serious extent, check for a wrinkle in the filter cloth, or other filter media, or for a small amount of cake in the joint surface which has not been properly cleaned. Serious leakage, except for special cases, is almost invariably due to carelessness of operation.

II. **CLOUDY FILTRATES:**

At the start of the filtration cycle, the filtrate usually runs cloudy for a short time until the deposit on the filter media builds up an effective filter cake. When a precoat of filter aid is used, there should be very little cloudiness.

If cloudiness persists, it may be due to a number of things. The pressure may be too high or may be fluctuating too much, leading to a pulsating effect which disturbs the filter cake on the filter media. The filter media may be torn. If cloudiness persists in the filtrate, the need for a filter aid in the main batch, a precoat of filter aid, or both is indicated.

If the filter media is torn, or if for any other reason, an individual filter chamber runs cloudy, the entire filtrate is affected. In open delivery filter presses these chambers can be determined and cut off at once by closing the outlet cock. Open delivery filter presses with plain bibb outlets, which cannot be easily cut off, are not suitable for use on any material where cloudiness would lead to a loss of valuable filter cake or to reduction in the clarification efficiency of the filter press. Continued cloudiness from certain chambers of a filter press call for a careful inspection of these chambers to determine the cause.

On closed delivery filter presses, there is no way of determining which chamber is delivering a cloudy filtrate unless a visible closed discharge fitting is used. This equipment is available on specially designed plates and makes it possible to identify the chamber that is leaking and to shut it off.

III. UNEVEN FILTER CAKES:

If any chambers show evidence of uneven cakes when the filter press is opened, the cause is usually a clogged feed port in the frame of that chamber. This condition, unless corrected, can cause plate breakage.

Uneven filter cakes may result from the use of a pump of inadequate capacity or too low a discharge pressure. On some types of free filtering materials with granular or crystalline solid content, bottom discharge types of plates may lead to uneven filter cakes, because of the rapid filtration of material at the bottom section of the chamber before a solid, uniform cake is built up on the entire surface of the filter media. In such cases, a top discharge type of filter is often desirable. Uneven filter cakes are not likely to lead to cloudy filtrates, where there is any possibility of pressure fluctuation in the feed line, but make it difficult to get good washing of the cake in any chamber where the cakes are uneven.

IV. SLOW FILTRATION RATE:

The nature of many materials make a slow filtration rate inevitable. If laboratory tests have been made and the rate of filtration is found to be slow, in spite of due consideration of filter aids, heating and other factors which might increase the rate, there is little that can be done to speed it up.

On the other hand, if the product filters at a slow rate, it may be advisable to investigate the possibility of speeding up the rate by the use of filter aid in the batch, of heating the material or of making possible changes in processing prior to filtration, which would change the character of the material so as to make speedier filtration possible.

On filter presses that have been in use for a considerable period, corrosion may have removed part of the pyramids off the draining surface to the extent of handicapping the filtration rate by providing inadequate drainage from behind the filter cloth.

V. CHECK LIST FOR OPERATION DIFFICULTIES:

1. **Pressure instantly increases to a high value.**

Check plates and frames for proper location, making certain that all the "V" handles are on the same side bar. See Section PFV where applicable.

Check cloths to see that all necessary holes have been provided and that there are no turned corners which block off a port. Holes in the cloths must match the holes in the plates.

2. **Filtration rate decreases rapidly so only a thin cake can be obtained.**

Suitable filter aid can be used as a precoat and in the slurry being filtered to improve the filtration rate.

3. **Pump does not deliver material to filter.**

Check suction line to make certain that there is no obstruction in it.

If pump is centrifugal or turban type, make certain that pump is not air bound.

If pump is diaphragm type, open all valves and check for solids that may lodge under balls. Remove ends and check diaphragms.

4. **Material flows through filter, but no pressure develops.**

Material is very fine filtering or the pump is undersize.

5. **Wash water rate increases rapidly with continuing wash and analysis of final cake shows poor washing.**

Cake contains soluble solids which are not completely in solution or cake itself is partially soluble. Dilute or heat feed to insure complete solution of soluble matter, or if cake is slightly soluble, use a wash solution that has first been saturated with the cake forming material.

VI. POOR PRECOATS OF FILTER AID:

If a filter aid precoat for the material is required and if there is difficulty in getting uniform coating, the reason is probably the use of a type filter not adapted to the precoating operation. Frequently, a filter press is installed without thought being given to the possible need for precoating. Later, the need for precoating arises and unless the type of filter press originally installed is suitable for a precoating operation, problems may be experienced.

VII. CAKE DRYING:

Cake drying involves the removal of the mother liquid or wash liquid from the filter cake by means of a gas (normally compressed air). It is practically impossible to determine exact requirements due to cake variations and moisture retentiveness. Practice shows that, if it is possible to dry the filter cake, the amount of gas will be from .08 - .2 cubic meters per minute for every square meter of filtration area, at a pressure of 2 bar, and a drying time from 5 to 30 minutes.

For further reading:

"SOLID/LIQUID SEPARATION EQUIPMENT SCALE-UP"

by: **Derek B. Purchase**
Upland Press
1 Katherine Street
Croydon CR9 1LB England

PLATE BREAKAGE

THE FOLLOWING CONDITIONS ARE SOURCES THAT CAN LEAD TO UNBALANCED PRESSURES CAUSING PLATE BREAKAGE IN A PLATE AND FRAME TYPE FILTER PRESS. THESE CONDITIONS CAN SOMETIME BE OBSERVED WHEN CLEANING THE FILTER PRESS, IN THE FORM OF THICK AND THIN CAKES, PARTIALLY FILLED CHAMBERS AND ALTERNATE FIRM AND SLOPPY CAKES. THESE CONDITIONS MUST BE CORRECTED BEFORE FILTRATION CAN CONTINUE.

WHAT CAN CAUSE BREAKAGE

<u>CAUSE</u>	<u>CORRECTION</u>
1. Clogged feed ports.	1. Clean feed ports thoroughly in frames. in recess plates, remove plugs left in feed eyes.
2. Intermittent pumping of feed pumps.	2. Eliminate cause of intermittent pumping. If pumps are to be restarted, start them at a very low pressure and gradually build pressure.

- | | | | |
|----|---|----|--|
| 3. | Short batches with insufficient solids | 3. | Have enough sludge available to complete the filter cycle or obtain a dummy plate to reduce press volume. |
| 4. | Solids build-up in plate drainage areas reducing flow to outlet. plugged or partially plugged outlet | 4. | Inspect plate drainage areas behind cloths periodically. Some cloths may allow more solids to pass through than other style cloth. Unplug & clean outlet. |
| 5. | High velocity constant pressure/flow pumps such as progressive cavity pumps used for feeding sludge to press may cause breakage due to velocity shock on one side of the plate. | 5. | Use pumps with a pressure/flow curve corresponding to the filtration curve of the material filtered. |
| 6. | Improper use of dummy plates. | 6. | Place dummy plate directly behind slide head plate. Do not use slide head plate only to shorten press chamber size. |
| 7. | Dynamiting of plates. Feed valve closed when feed pump started or outlet valves closed when feed pump started. | 7. | Open all valves before starting feed pumps. Size outlet piping to minimize back pressure. |
| 8. | Careless handling of plate | 8. | Handle plates carefully. |
| 9. | Thermal Shock | 9. | Avoid excessive temperature change between ambient and process temperature. If necessary, preheat press at 2 degrees F per minute when ambient to process temperature greater than 30 degrees F. |

AN EXAMPLE OF THE MAGNITUDE OF UNBALANCED PRESSURE CAN BE SEEN ON A 48" FILTER PRESS. IF THE PRESS PRESSURE WAS 60 PSI ON ONE SIDE OF THE PLATE AND ZERO ON THE OTHER SIDE, THE RESULTANT FORCE WOULD BE 138,240 LBS. ON THE PLATE.

WASH & NON-WASH PLATE ORIENTATION

SECTION PFV

**D. R. SPERRY & COMPANY
112 NORTH GRANT STREET
NORTH AURORA, IL 60542
PHONE: 630 892-4361**

WASH & NON-WASH PLATE ORIENTATION

When filter elements are provided by D. R. Sperry & Company, they may be of a variety which allows for cake washing and/or air blow down. It is important that these plates, called wash and non-wash types, be assembled in the filter press in the correct sequence. As there are a number of variations in styles of wash and non-wash plates, the rest of this section will be devoted strictly to proper assembly and identification of types.

D. R. Sperry & Company uses a permanent mark on each plate in the form of a button to define wash and non-wash plates. These buttons will normally be located just above one of the handles of the plate. A one button plate is a non-wash plate, a three button plate is a washing plate and, if there are two buttons, it is a frame.

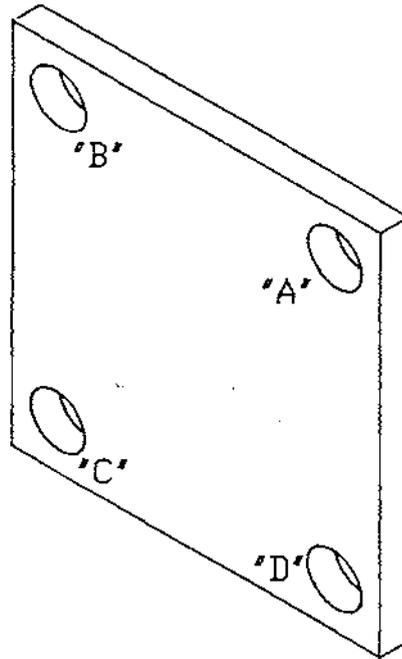
When assembling the filter plates, begin with the stationary head plate. This is the plate which contains the threaded eyes which accept the piping for the press. Once this plate is installed, observe and note the number of buttons on the plate and which side they are on. All remaining elements will be installed with the buttons on the same side as the stationary head plate buttons.

If the plates are recessed (i.e., the cake forms in a chamber created by two adjacent plates), then the stationary head plate will be a one button or three button plate. If the stationary head plate is a one button, then the next plate must be a three button and the next one will be a one button. One button and three button plates will alternate through the stack.

If the press is a plate and frame, then the stationary head plate will be followed by a frame regardless of the number of buttons. If the stationary head plate is a one button, then the next element will be a two button frame followed by a three button plate, followed by a two button frame, followed by a one button plate, etc. The button arrangement will be one, two, three, two, one, two, three, two, one, etc. through the stack. If the stationary head plate is a three button, then the order will reverse: three button, two, one, two, three, two, one, etc.

Failure to observe proper installation may result in poor filtering characteristics and possible plate damage.

Consult the factory if there are any questions.



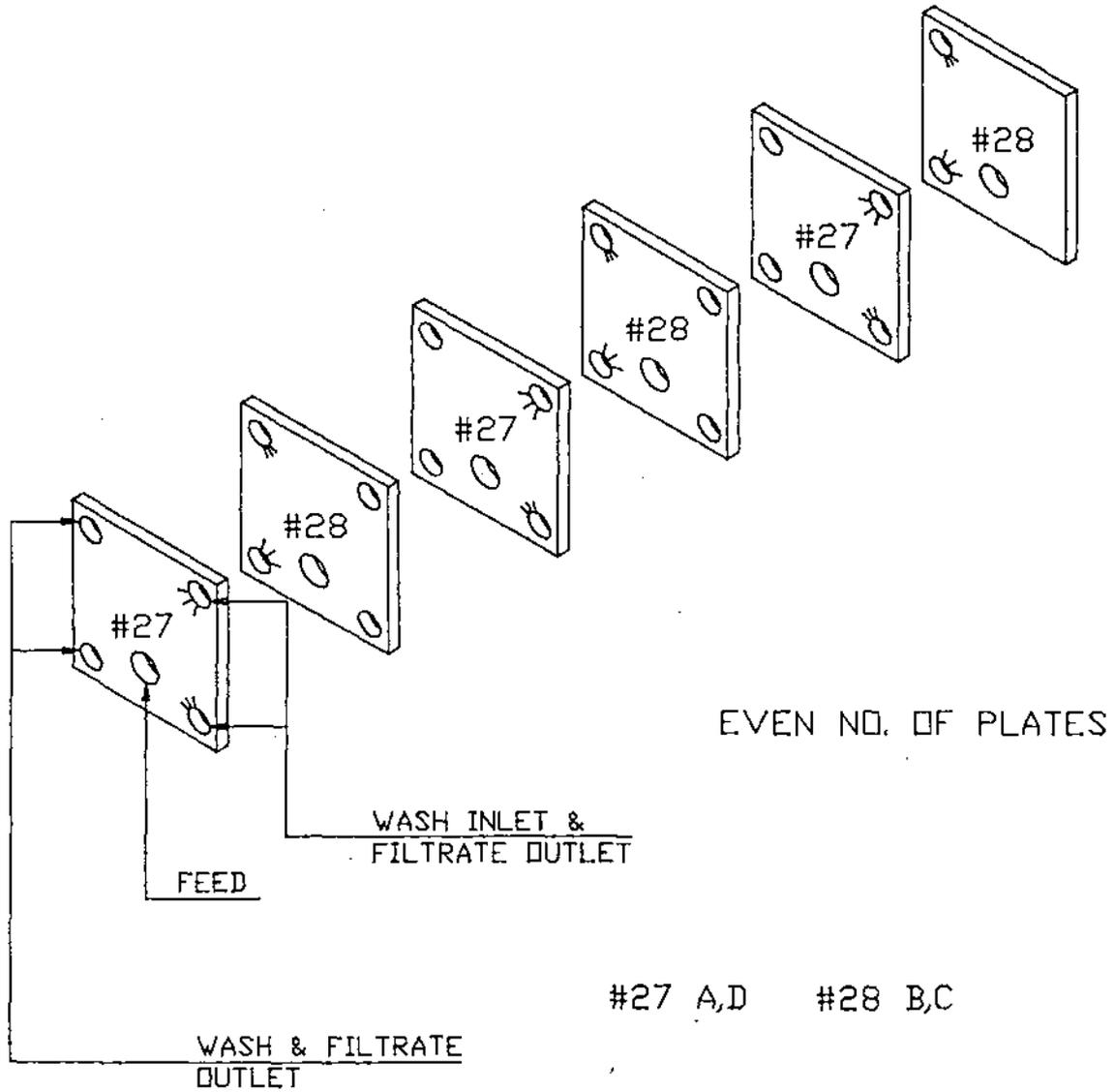
VIEWING STATIONARY HEAD END OF PRESS

LETTER AFTER PLATE OR FRAME STYLE NO.
INDICATES EYE IS PORTED

EXAMPLE:

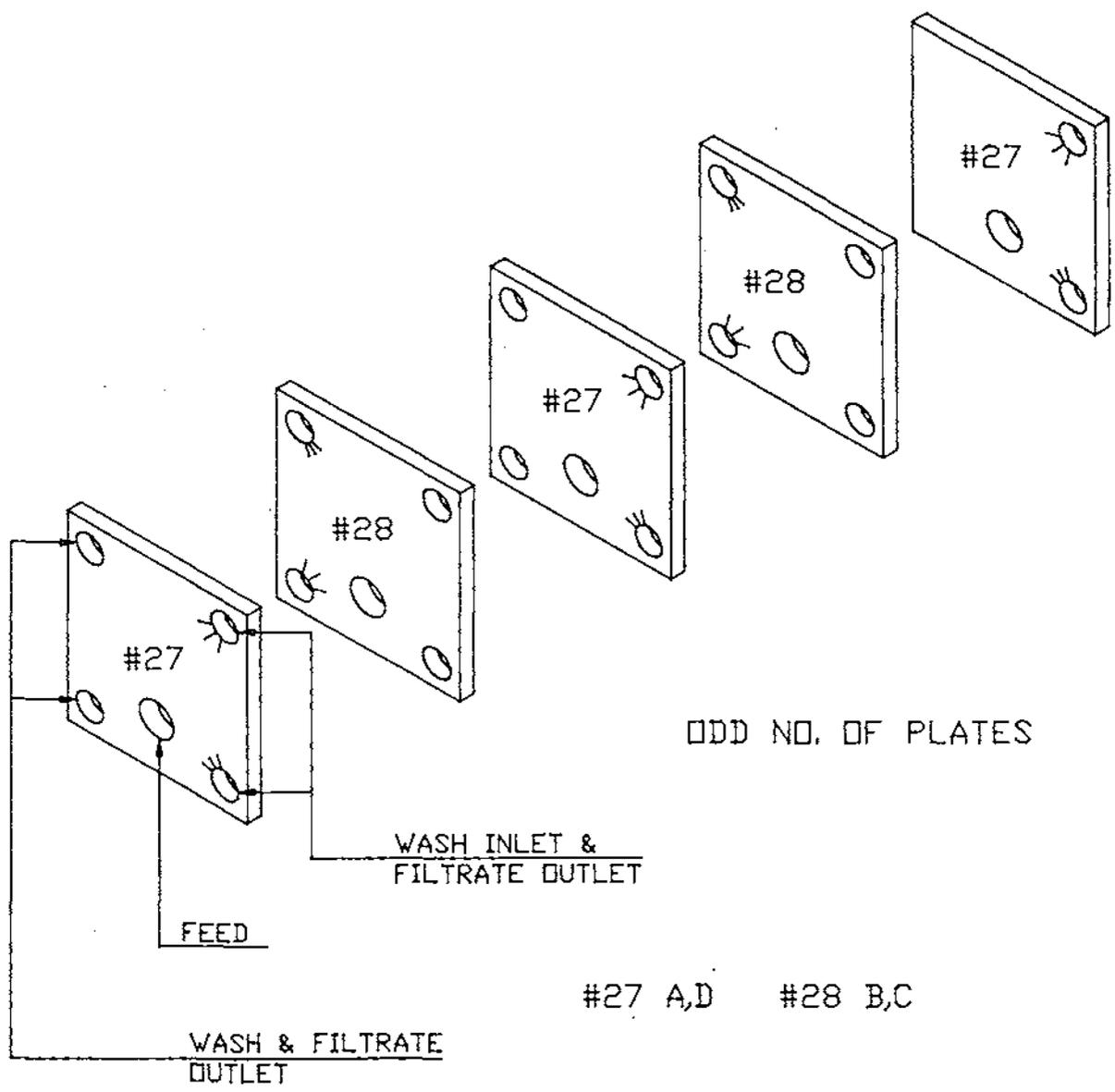
- #41 B,C - TWO LEFT HAND PLATE EYES PORTED
- #42 A,D - TWO RIGHT HAND FRAME EYES PORTED
- #41 B - UPPER LEFT HAND PLATE EYE PORTED
- #21 A,B,C,D - ALL EYES PORTED
- #21 A,C - UPPER RIGHT & LOWER LEFT EYE PORTED

#27 - WASH PLATE - 3 BUTTON
#28 - NON-WASH PLATE - 1 BUTTON



STANDARD PORTING FOR WASH & NON-WASH
PLATES - REGULAR & CRN

#27 - WASH PLATE - 3 BUTTON
#28 - NON-WASH PLATE - 1 BUTTON



STANDARD PORTING FOR WASH & NON-WASH
PLATES - REGULAR & CRN

CRN CLOTH INSTALLATION

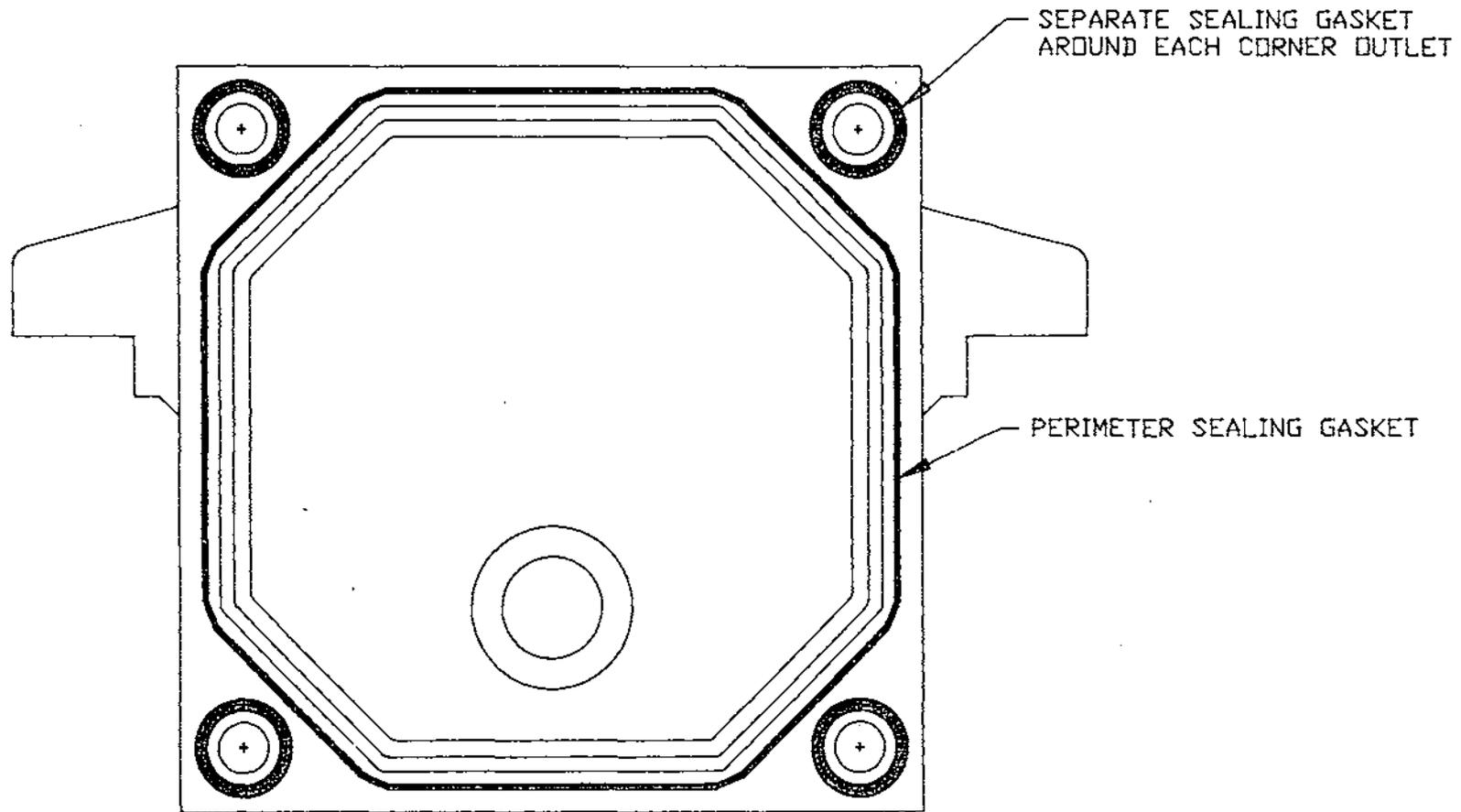
Installing cloth and gasketing in the Sperry CRN plate must be done with caution and attention to detail. As a part of this section of the manual, the installer will find reference figures which show typical installation procedures. To help prevent tearing of the cloth during installation, it is suggested that a Sperry installation tool be used. There should be such a tool included with the cloth that originally came with the press. Additional tools may be acquired through D. R. Sperry & Company by referring to Part Number 23092.

It is recommended that the plates be removed from the press to perform the following procedures. Use care not to damage plates during removal or replacement. When replacing plates in press, do not allow the corners of the plate to rip the cloth of any plate already installed!

Refer to Figure 1 which shows a typical section view of cloth, caulking gasket and sealing gasket. Note the arrow, which indicates the direction that the gasket should be driven from. Use the Sperry installation tool or a blunt wedged shaped piece of plastic or wood to drive the gasket into the groove. Drive the gasket gently, using only enough force to seat the gasket. **DO NOT CREATE HOLES OR TEARS IN THE CLOTH AS THIS WILL CAUSE LEAKAGE AND POSSIBLE CLOTH FAILURE.** Support the cloth at equal points around the perimeter in order to help center the cloth. See Figure 2.

Work around the groove until the gasket is completely installed. Gasket ends must butt up against each other, no gaps are allowed anywhere in the gasket! Use a razor knife to remove excess material from outside of gasket joint. Leave about 1/8" of excess cloth remaining beyond gasket to insure there is enough material to prevent the cloth from being pulled out from under gasket.

Install the sealing gasket by working the gasket into the groove by hand. All gasket joints must butt up against each other in order to provide a complete seal. NOTE: This gasket is subject to high pressure along its inner periphery. One continuous gasket is preferred with one butt joint. Do not use several pieces of gasket to try to create a seal.



CRN CLOTH INSTALLATION
FIGURE 2

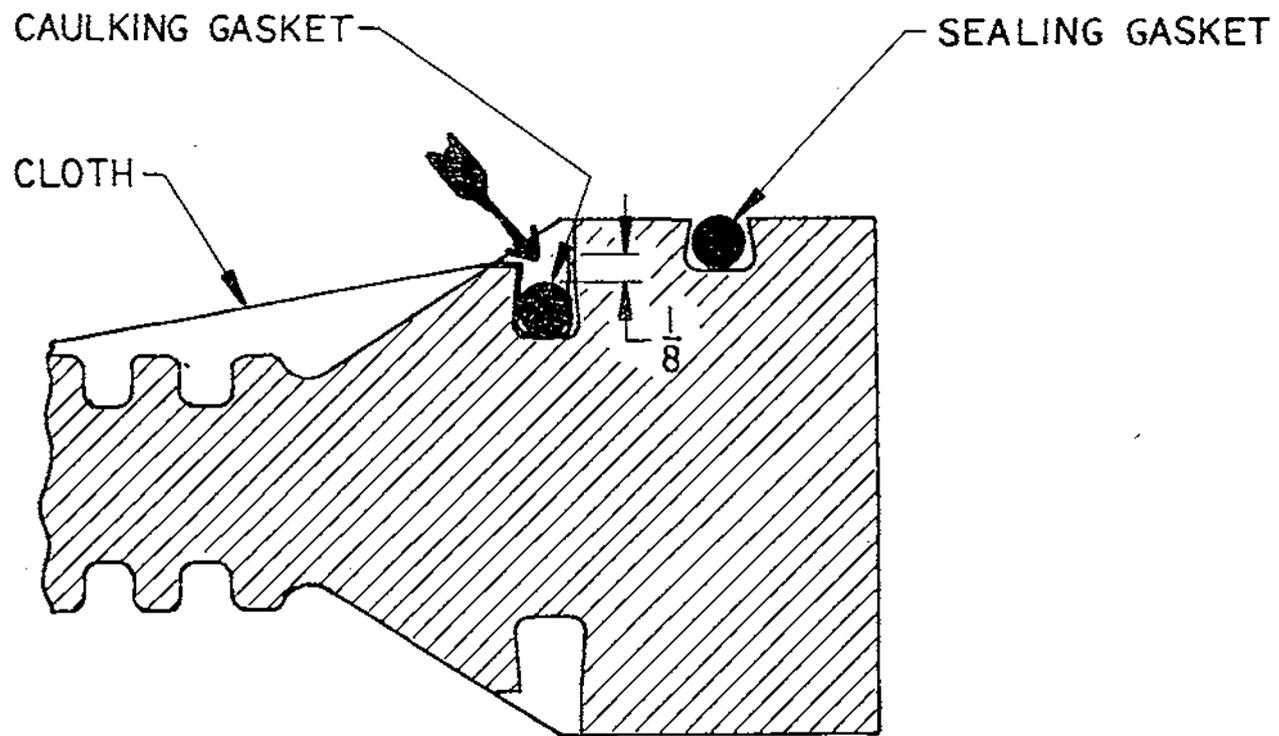


FIGURE 1

HEAD CONNECTION INSTALLATION

SECTION HCI

D. R. SPERRY & COMPANY
112 NORTH GRANT STREET
NORTH AURORA, ILLINOIS 60542
PHONE: 630 892-4361
FAX: 630 892-1664

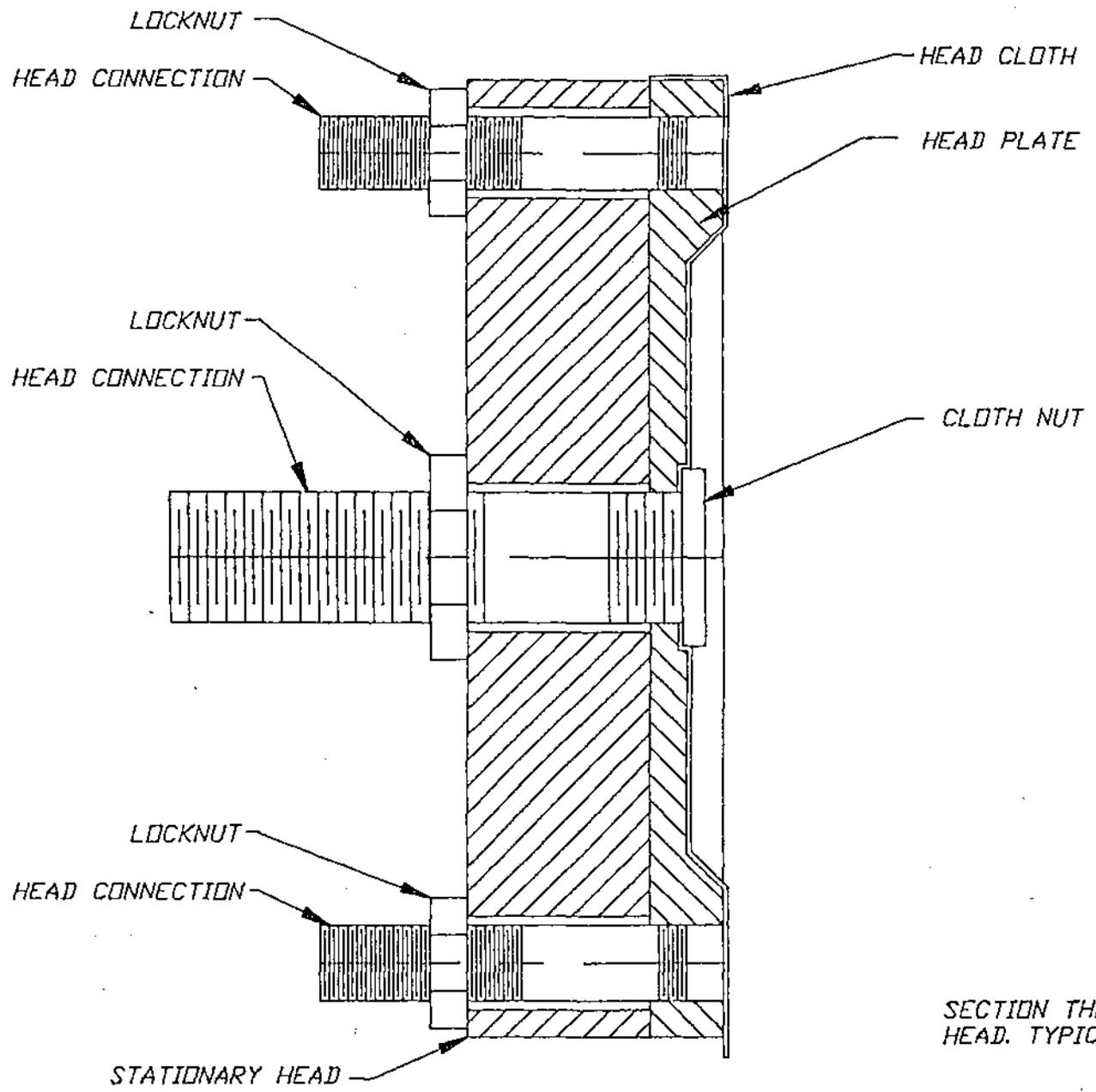
HEAD CONNECTION INSTALLATION

Your Sperry Filter Press comes complete with head connections to provide proper feed line and outlet line sizes. They are intended to adapt directly to standard NPT pipe sizes for ease of assembly.

If your press is fitted with a center feed (this feed may be center or bottom center located), the appropriate head connections should screw through the head plate for about 1/2". The corner or outlet head connections are screwed in until they bottom out. Drape the head cloth over the head plate and the cloth pins at the top of the head plate to retain the cloth. Install the cloth nut by screwing it onto the 1/1" of feed connection protruding through the head plate, capturing the head cloth and retaining it against the surface of the head plate. Install the locknuts on each head connection and tighten them down against the outside face of the stationary head. **DO NOT OVERTIGHTEN.**

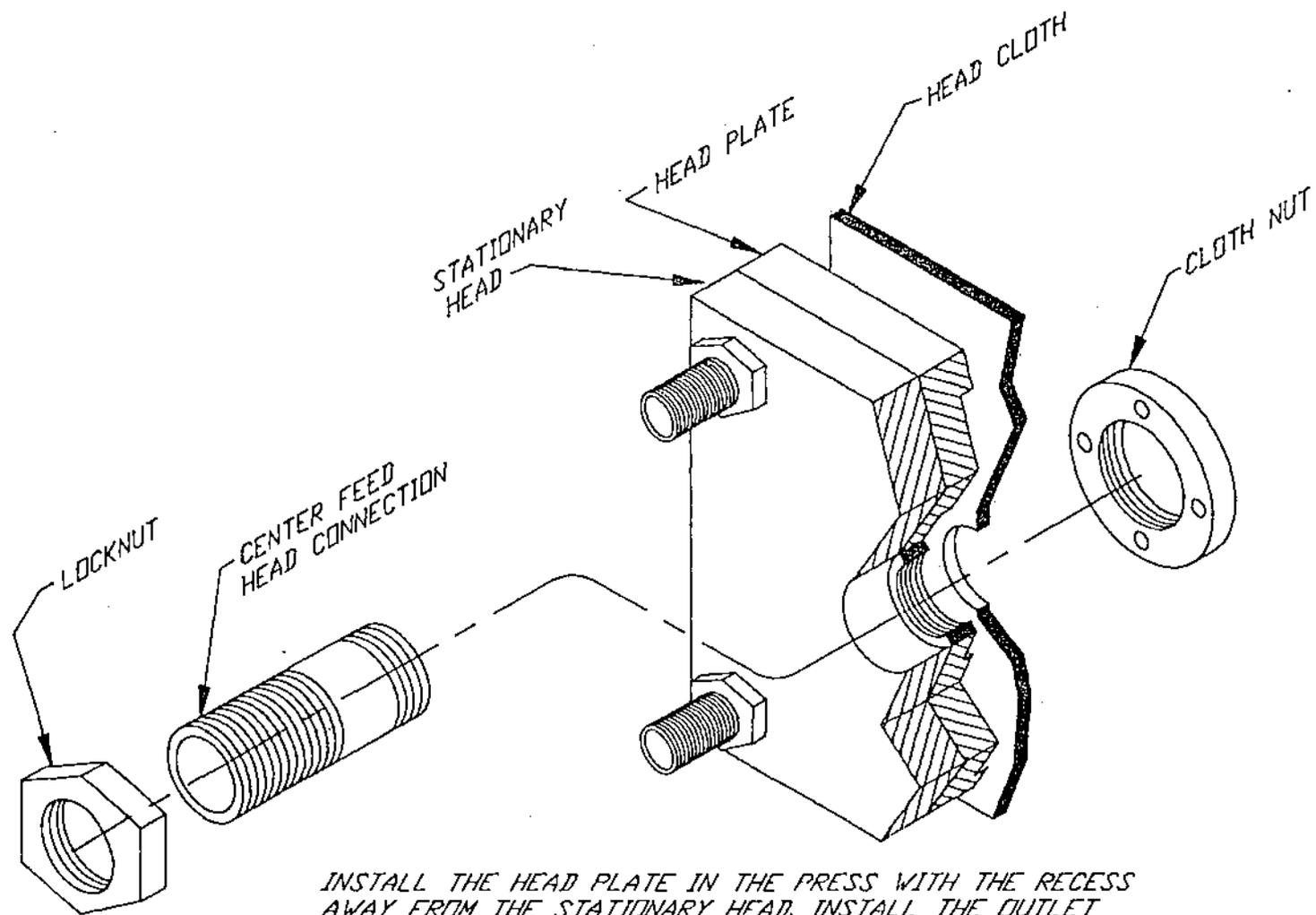
Your installation, when complete, should resemble the enclosed diagram "Section Through Stationary Head". The press is now ready to be pipe fitted for feed and outlet lines.

WARNING: If outlets are to be manifolded together, keep manifold area equal to or greater than the sum of the areas of the pipes entering it. Otherwise, back pressure may occur causing leakage and longer filtering cycles.



SECTION THRU STATIONARY HEAD, TYPICAL CENTER FEED.

D:\ACAD\MISC\HEADCDN2



INSTALL THE HEAD PLATE IN THE PRESS WITH THE RECESS AWAY FROM THE STATIONARY HEAD. INSTALL THE OUTLET HEAD CONNECTIONS BY SCREWING INTO THE PLATE FROM THE STATIONARY HEAD SIDE. WHEN HAND TIGHT, INSTALL THE LOCKNUT TO SECURE IN PLACE. INSTALL CENTER FEED HEAD CONNECTION BY SCREWING INTO HEAD PLATE SO THAT ABOUT 1/2" OF PIPE STICKS OUT PAST THE COUNTERBORE IN THE HEAD PLATE. SLIP HEAD CLOTH OVER THE END OF THE HEAD CONNECTION AND SCREW ON THE CLOTH NUT FIRMLY. INSTALL THE CENTER FEED LOCKNUT.

HEAD CONNECTION
COMPONENT IDENTIFICATION
AND INSTALLATION.

AHOP-IV POWER UNIT

D. R. SPERRY & COMPANY
112 NORTH GRANT STREET
NORTH AURORA, IL 60542
PHONE: 630 892-4361

AHOP4.1

AHOP-IV POWER UNIT

The Sperry Automatic Hydraulic Oil Pressure unit uses a regulated air supply (by customer) to produce a constant pressure oil output adjustable for proper closing force of any filter press. The unit contains two air/oil booster pumps. One provides a high volume output for rapid advance and retract, while the other provides high pressure for clamping force. A manual valve is provided for advance, neutral and retract positions. Two gauges are provided to monitor air input pressure and hydraulic clamping force.

An adjustable relief valve is provided for over pressure protection. An automotive type filter is used to clean return line oil and a strainer is provided on the intake line for component protection.

OPERATION OF AHOP-IV

THE INLET AIR REQUIREMENT:

- NO FILTERING REQUIRED.
- NO LUBRICATION REQUIRED
- 100 PSI MAXIMUM PRESSURE
- 80 PSI MINIMUM PRESSURE
- 5.5 CFM

TO CLOSE: Move the selector switch to the close position. When the press is fully closed, gauge will read proper hydraulic pressure and booster will stall. Feed pumps may now be started. LEAVE SWITCH IN THE CLOSE POSITION DURING FILTER CYCLE!

TO OPEN: Move the selector switch to the open position. When the press is fully open, move the switch to the neutral position. Press is now ready to be cleaned. IF PLATE SHIFTER IS USED, LEAVE THE SWITCH IN THE OPEN POSITION UNTIL CLEAN CYCLE IS COMPLETE OR SHIFTER MAY NOT FUNCTION.

CAUTION: Customer air shut-off is required when servicing this device. If air supply is left on, high pressure oil may be trapped between the booster and the check valve.

During the filtering cycle, booster may periodically cycle. This is a normal condition which maintains closing force

TROUBLE SHOOTING

Refer to the hydraulic schematic and parts location diagrams elsewhere in this manual.

I. PRESS FAILS TO CLOSE

- A. Check gauge, Item 1, if no reading, turn on air supply.
- B. check selector switch position. Make sure it is in the close position.
- C. Check oil level in the reservoir.

II. PRESS FAILS TO REACH CLOSING PRESSURE

- A. Check hydraulic pressure gauge Item 2. If booster is cycling and gauge shows fluctuation, increase the setting of relief valve Item 4.
- B. If previous step has no appreciable effect, lower the setting of regulator Item 11. If booster continues to cycle, the problem lies in the booster check valves or the main cylinder seals. Try bleeding the system of any trapped air.

III. PRESS FAILS TO OPEN

- A. Check gauge Item 1. If no reading, turn on air supply.
- B. Check selector switch position. Make sure it is in the open position.
- C. If above does not resolve the problem, cylinder seals are probably leaking.

RELIEF VALVE SETTING

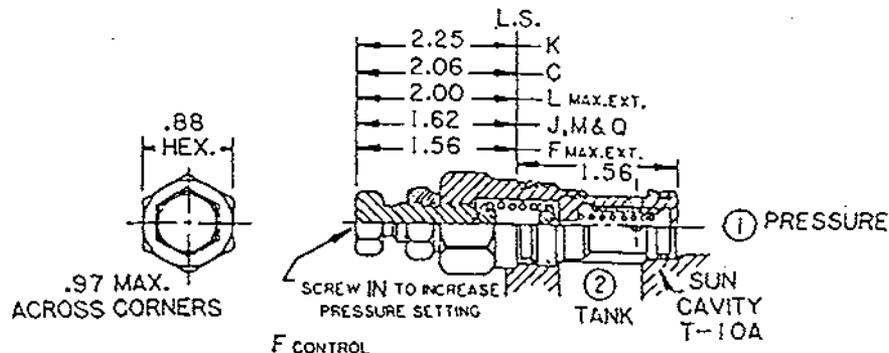
The relief cartridge is a basic service item. It is easily removed from the body for cleaning or replacement, but is not designed to be disassembled or repaired in the field. It is never necessary to remove the entire valve from the circuit piping. Simply unscrew the cartridge from the body.

The most common cause of a cartridge failing to operate is dirt in the hydraulic system. If the cartridge does not operate as required, it should be removed from the valve body and thoroughly cleaned by washing in a suitable solvent. If the cleaning procedure does not eliminate the problem, replace the cartridge.

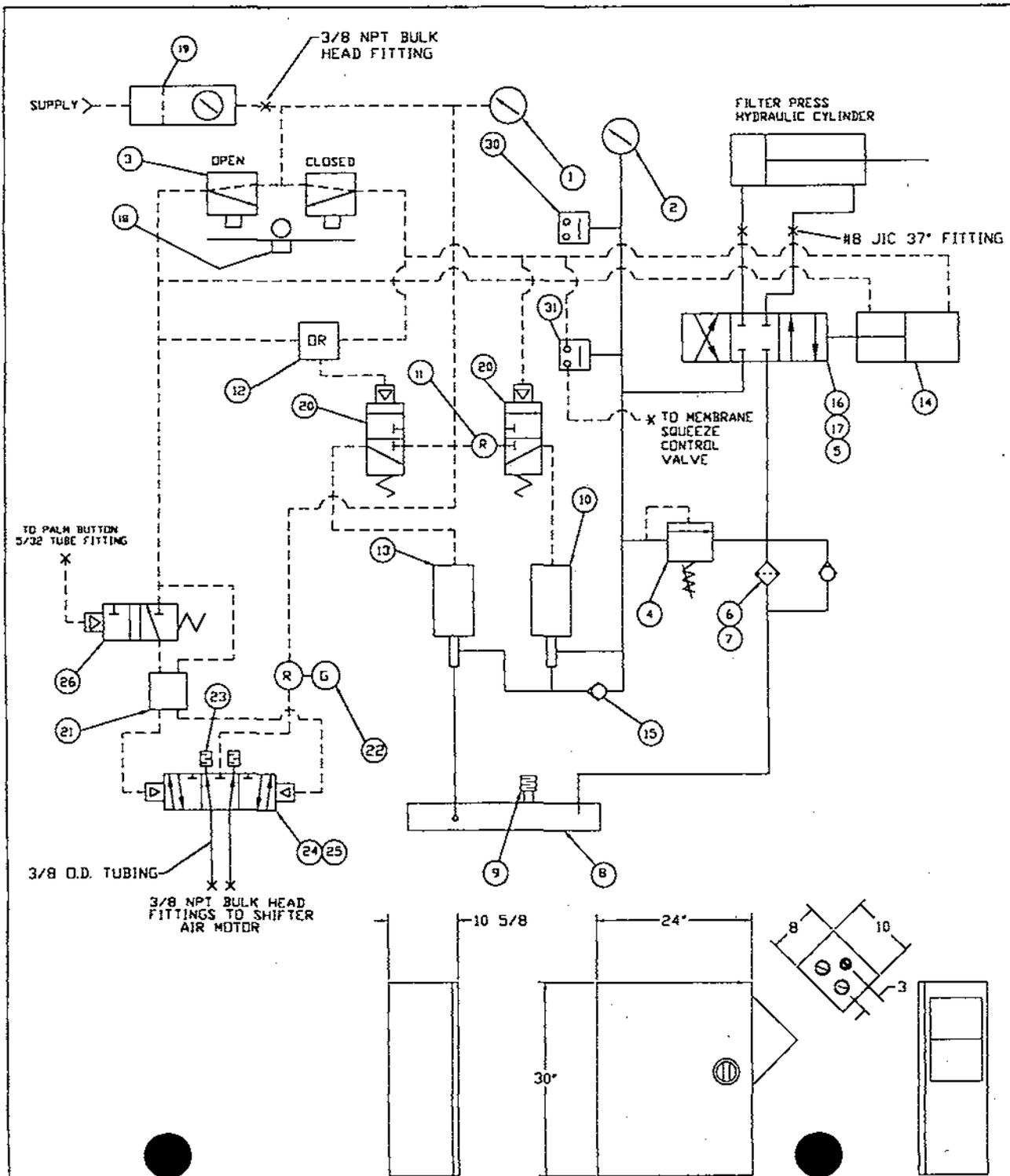
The pressure may be adjusted by screwing the stem in to increase pressure setting or out to decrease the pressure. The following procedure may be used to adjust the valve cartridge setting:

1. Select the CLOSE position with valve actuator Item 18.
2. Gradually increase air pressure by adjusting regulator Item 11 until relief valve setting is reached. The correct relief valve setting varies depending on the press and its application. The correct settings for working pressure and relief valve pressure may be found on the general arrangement drawing which came with your press.
3. Adjust the relief valve by turning stem in or out until pressure reaches correct setting and then drops back approximately 200 PSI. Tighten the cartridge locking nut at this point.
4. Select the OPEN position with valve actuator Item 18. Once pressure drops off, return selector to CLOSE position and observe the highest pressure reading before the pressure drops off. This should equal the relief valve pressure setting.
5. Reduce booster air pressure by adjusting the regulator Item 11 until specified working pressure is achieved.

AHOP4.5



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ITEM	PART NO.	DESCRIPTION	QTY.
1	36046	0-160 PSI AIR PRESSURE GAUGE	1
2	36047	0-5000 PSI HYDRAULIC GAUGE	1
3	63186	2 POSITION 3 WAY VALVE	2
4	63140	5000 PSI RELIEF CARTRIDGE	1
5	24103	VALVE TO ACTUATOR COUPLING	1
6	63139	10 MICRON FILTER	1
7	63234	FILTER HEAD	1
8	----	HYDRAULIC OIL RESERVOIR	1
9	61496	OIL FILLER CAP & BREATHER	1
10	63243	HIGH PRESSURE BOOSTER	1
11	63257	AIR REGULATOR	1
12	58193	OR LOGIC ELEMENT	1
13	63219	HIGH VOLUME BOOSTER	1
14	63258	ROTARY ACTUATOR	1
15	61497	CHECK VALVE	1
16	61499	3 POSITION 4 WAY VALVE	1
17	61498	VALVE SUBPLATE FOR ITEM 16	1
18	63193	VALVE ACTUATOR FOR ITEM 3	1
19	63231	FILTER REGULATOR, 3/8 NPT	1
20	58194	2 POSITION 3 WAY VALVE	2

FOR SPS OPTION (61482) ADD FOLLOWING ITEMS:

21	63188	COUNT 2 MODULE	1
22	63259	REGULATOR WITH GAUGE	1
23	63260	EXHAUST MUFFLER 3/8 NPT	2
24	63261	3 POSITION 5 WAY VALVE	1
25	63262	SUB PLATE FOR P/N 63261	1
26	58195	2 POSITION 3 WAY VALVE	1

FOR APC OPTION (61483) ADD FOLLOWING ITEM:

30	61462	HYDRAULIC PRESSURE SWITCH	1
----	-------	---------------------------	---

FOR SQUEEZE OPTION (61534) ADD FOLLOWING ITEM:

31	61535	HYD. TO PNEUMATIC PRESSURE SWITCH	1
----	-------	-----------------------------------	---

61579	AHOP IV RIGHT HAND WITH NEMA 4 ENCLOSURE
61534	AHOP IV RIGHT HAND MEMBRANE SQUEEZE INTERLOCK
61484	AHOP IV RIGHT HAND WITH SPS AND APC OPTIONS
61483	AHOP IV RIGHT HAND WITH APC CONTROLLER OPTION
61482	AHOP IV RIGHT HAND WITH SPS SHIFTER OPTION
61481	AHOP IV RIGHT HAND STANDARD

PART NO.	DESCRIPTION
PART NO.	SEE CHART
DESCRIPTION	AHOP IV RIGHT HAND STYLES
D.R. SPERRY & CO.	
112 N. GRANT ST. N. AURORA, IL. 60542	
TOLERANCES UNLESS OTHERWISE SPECIFIED	DRN. CHR.
X DECIMAL +/- .030	FRACTIONAL +/-
XX DECIMAL +/- .015	0625
XXX DECIMAL +/- .005	125
DATE	1481

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AIR BLOW DOWN MANIFOLD
OPERATION
SECTION MO

D. R. SPERRY & COMPANY
112 NORTH GRANT STREET
NORTH AURORA, IL 60542

Referring to the press general arrangement drawing found in the back of this manual, please locate the Wash/Air Inlet Valve and the Feed Valve. A third valve exists between the vertical legs of the manifold and will be referred to as the Cross Over Valve.

To Filter: CLOSE the Wash/Air Inlet Valve, OPEN the Cross Over Valve and OPEN the Feed Valve. Begin pumping slurry.

To Blow Down/Wash: CLOSE the Feed Valve, CLOSE the Cross Over Valve and OPEN the Wash/Air Inlet Valve. Begin pumping wash fluid or air through Wash/Air Inlet Valve.

If a valve has been added to the outlet side of the manifold, it must be open during the above cycles.

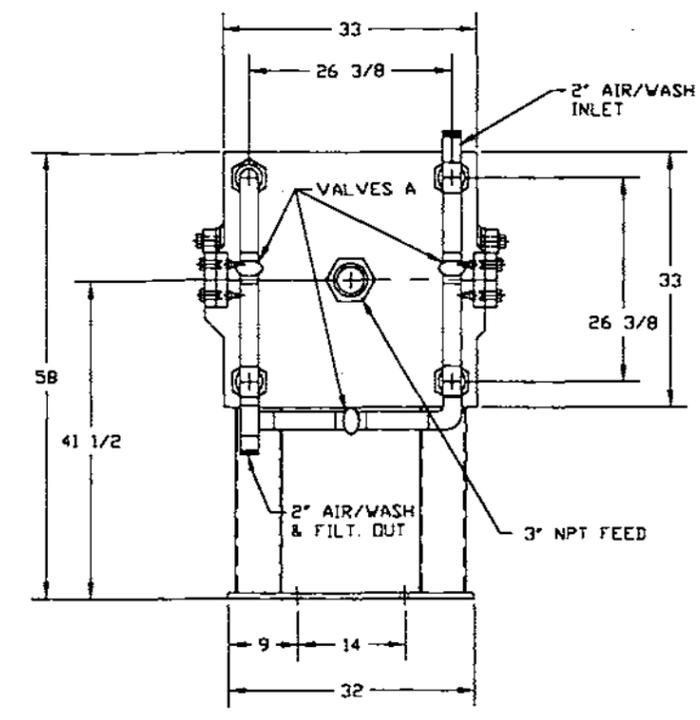
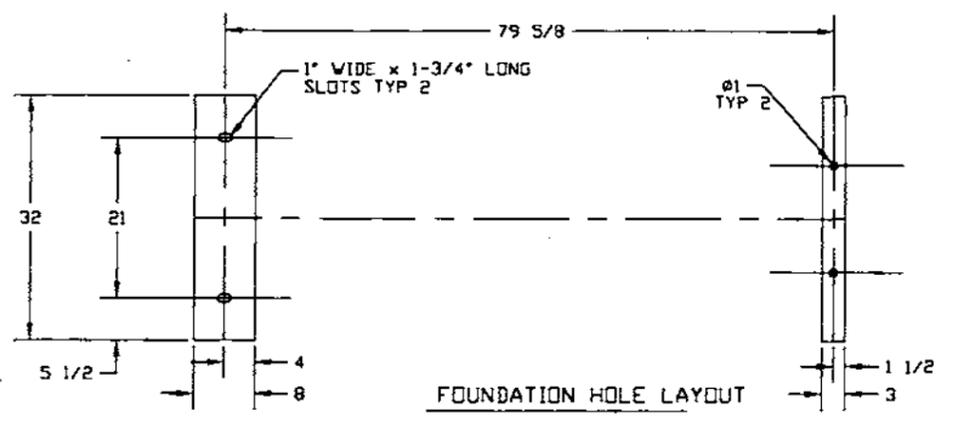
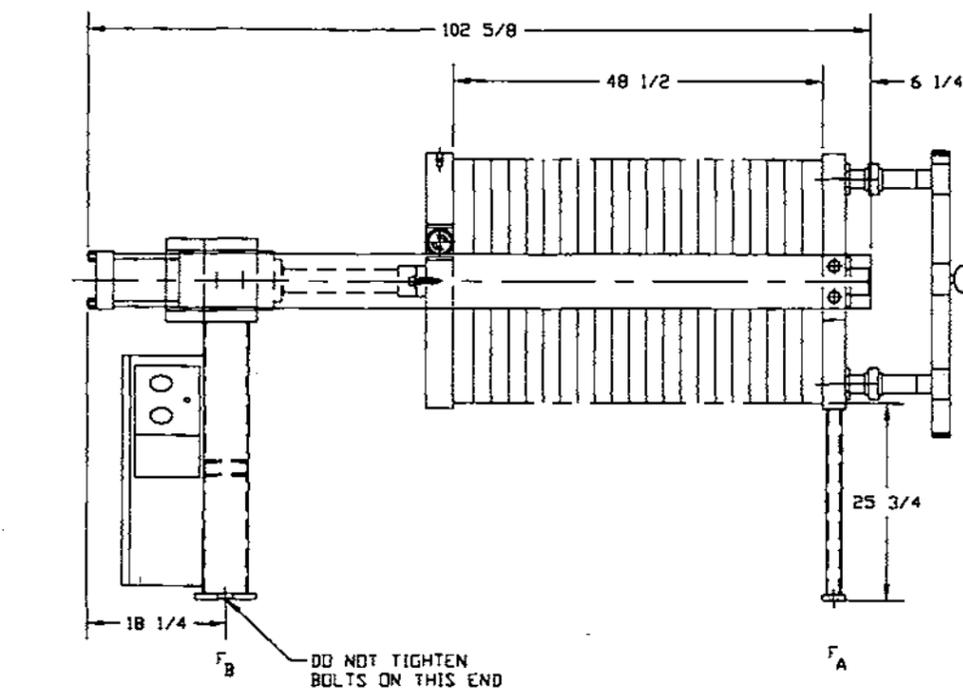
VALVE SEQUENCE:

In the precoat mode, valves 1,2,3 and 6 will be in the OPEN position. Valves 4,5,7 and 8 will be in the CLOSED position. During **filtering mode**, valves 1 through 6 will be in the OPEN position. Valves 7 and 8 will be in the CLOSED position.

For reverse core blow valves, 1, 6 and 8 will be in the OPEN position. Valves 2,3,4,5 and 7 will be in the CLOSED position. For **blow down/wash** valves 2,3,4,5 and 7 will be in the OPEN position. Valves 1,6 and 8 will be in the CLOSED position.

Note: Refer to the press general arrangement drawing, found in the back of the manual, for manifold and sequence chart.

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STATIONARY HEAD END

SPECIFICATIONS:

FILTER PRESS SIZE: 32" E PRESS
 MAXIMUM FILTRATION PRESSURE: 100 PSI
 CHAMBERS: 20 @ 1 1/4" THICK
 FILTRATION AREA: 213 SQUARE FEET
 VOLUME: 10.0 CUBIC FEET

HYDRAULIC POWER UNIT:
 TYPE: AHOP IV
 WORKING PRESSURE: 3200 PSI
 RELIEF VALVE SETTING: 3700 PSI
 AREA REQ: 5.5 SCFM OF 80 PSI AIR

LOADS ON LEGS ARE APPROXIMATE AND BASED ON A FULL COMPLEMENT OF PLATES FILLED WITH CAKE AT 80 LBS./CUBIC FOOT:
 F_A = 2885 LBS. F_B = 2450 LBS.

MANIFOLD OPERATIONS:
 TO FILTER: OPEN VALVES A.
 TO WASH OR BLOW DOWN: CLOSE VALVES A.

SERIAL NUMBER: X58623
 CUSTOMER: TAYLOR LUMBER & TREATING, INC.
 CUSTOMER NO: JL1000-800

D:\DWG\32\3276

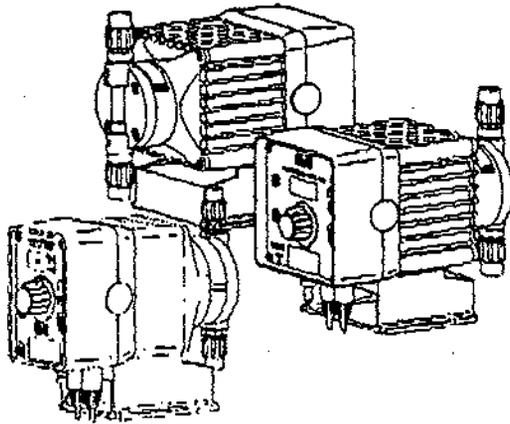
SERIAL NUMBER X58623		D.R SPERRY & CO. 112 N. GRANT ST. N. AURORA, IL. 60542	
DESCRIPTION 32" SPERRY E PRESS WITH AHOP-IV POWER UNIT. PRESS TO HAVE PURE POLY #CRN-W AND #CRN-NW PLATES WITH 5/8" RECESS PLATES TO HAVE #1PI CLOTH. AIR BLOW DOWN MANIFOLD OF PVC.			
DRN. JJ	DWG. NO.	E3276	
CHKD.			
DATE 10/25/00			
SCALE 1=16			

SYM.	DATE	REVISION	BY

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Instruction Manual

Series A9, B9, and C9 Electronic Metering Pumps



For file reference, please record the following data:

Model No: _____

Serial No: _____

Installation Date: _____

Installation Location: _____

When ordering replacement parts for your LMI Series A9, B9 and C9 Metering Pump or Accessory, please include complete Model Number and Serial Number of your unit.



8 Post Office Square
Aston, MA 01720 USA
TEL: (978) 263-6800
FAX: (978) 264-0172
<http://www.lmipumps.com>



Replaces same of Rev. A 8/96
1798. B 11/87

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1.0 Introduction

The Series A9, B9 and C9 electronic metering pumps offer an extensive range of features, including microprocessor control for accurate and flexible automation in response to instrument signals. The microprocessor design employs a customized liquid crystal display (LCD) and tactile response keypad. The "state-of-the-art" surface mount electronics are fully encapsulated to ensure protection in its working environment. All external inputs and outputs are opto-isolated from the microprocessor.

This manual supplement describes programming and operation. It also describes details of the pumps external inputs and outputs and how they are connected.

For complete details on Installation, Maintenance and Troubleshooting, please refer to Electronic Metering Pumps Manual (P/N 1615).

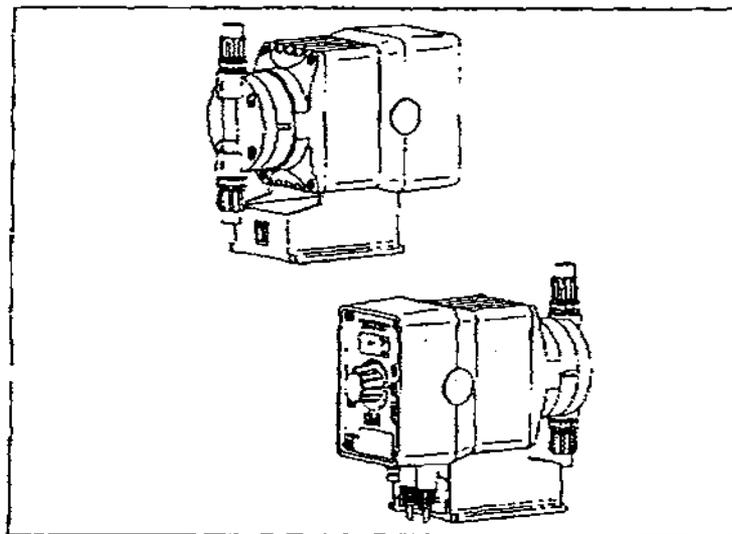


Figure 1: LMI Series A9 Electronic Metering Pump

2.0 Unpacking

You should find the following items in the box:

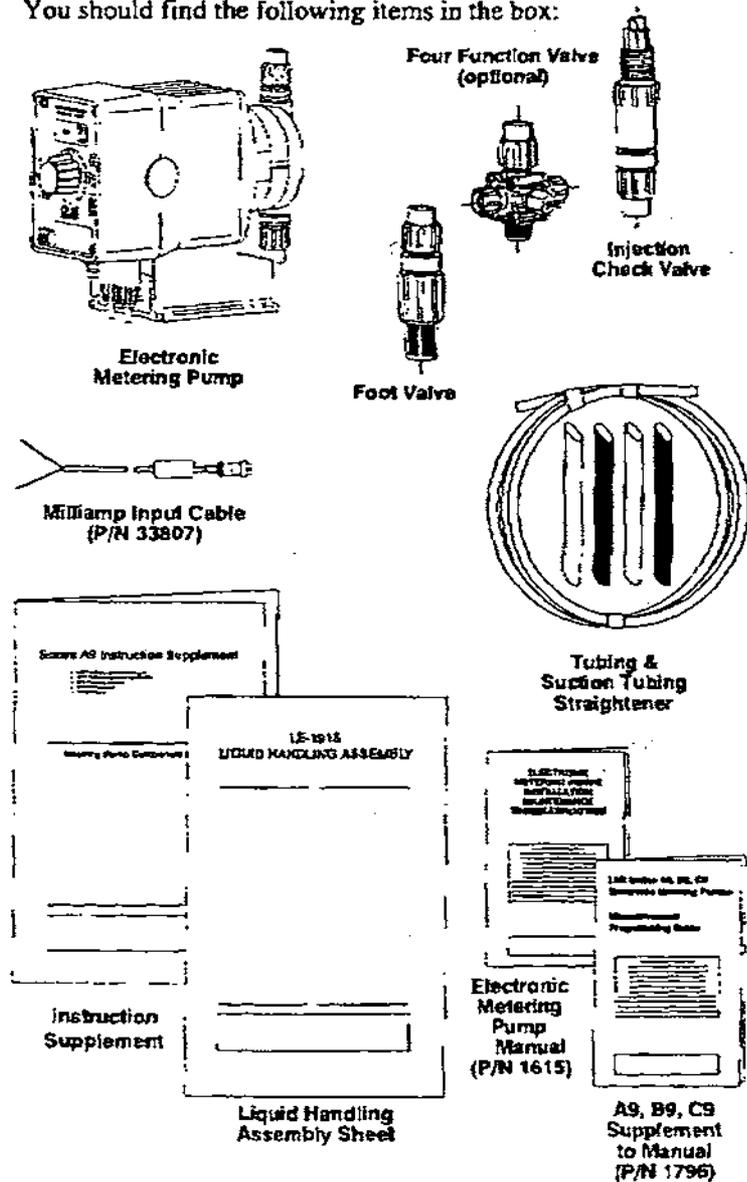


Figure 2: Unpacking Items

3.0 Features

- Stroke frequency adjustment from 0 SPH (strokes per hour) to 100 SPM (strokes per minute)
- Internal (manual) or external mode select
- Flexible slope adjustable response to mA input signals
- Divide or multiply (batch) incoming pulses (1 to 999)
- Batch accumulate option
- Integral blowdown controller feature
- Keypad locking
- Low-level shutoff with alarm output
- Programmable flow monitoring with alarm output (with FM-200-9 Digi-Pulse™)
- 6-level pressure control
- Continuous non-volatile memory (EEPROM)--no battery required
- Remote ON/OFF control
- Pulse (pacing) output
- Automatic line voltage compensation and over voltage protection
- Programmable menu for optional features/parameters
- Serial communication interface option for computer control (LiquiComm™)

4.0 How to Interpret the Model Number

The silver data plate (located on the front of the pump) tells you how your pump is configured.

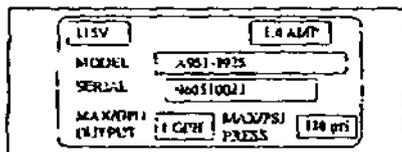


Figure 3a : Data Plate

Included on the data plate is the model number of the pump. Each number in the model number represents the following in Figure 3b.

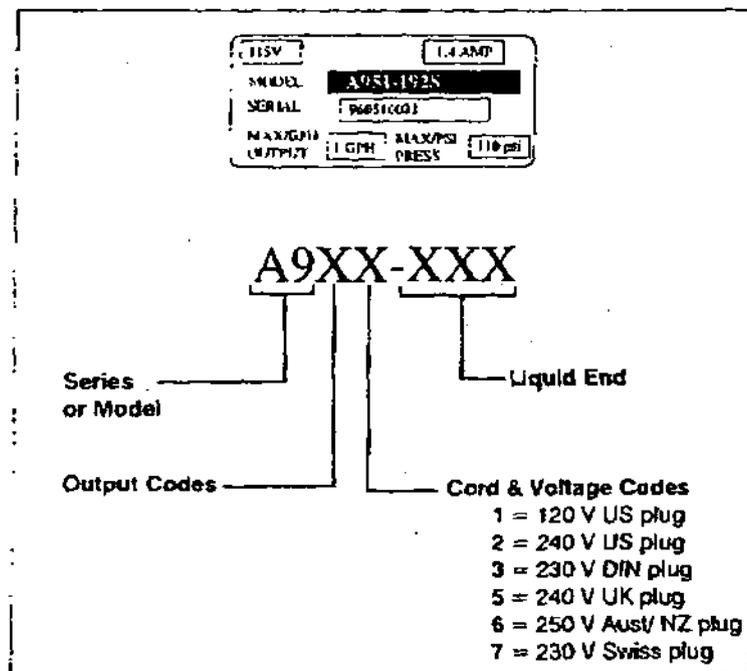


Figure 3b : Part Number Representation

5.0 Pre-Installation and Installation Instructions



Specific precautions should be taken when working with all LMI metering pumps.

Please read Section 3.0 in the Electronic Metering Pumps manual (P/N 1615) for pre-installation instructions.

For complete installation instructions, see Section 4.0 in the same manual.

6.0 Accessories

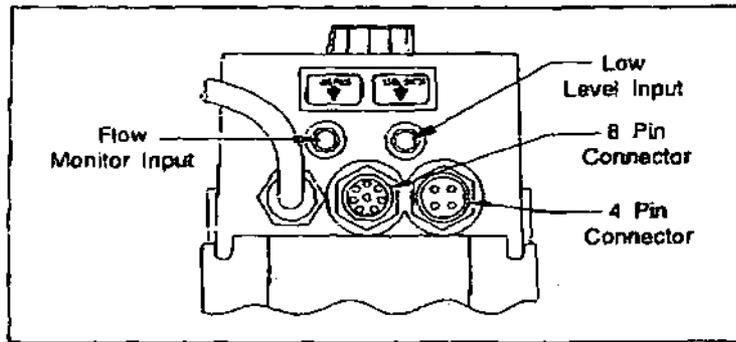


Figure 4: External Input and Output Connections



For specific descriptions of pump inputs and outputs, see Appendix A in the rear of this manual.

6.1 MilliAmp Input Cable (P/N 33807)

Each pump includes a 2-conductor cable assembly which connects to the 8-pin connector. It is available for pacing in response to a 0 to 20 mA (4-20 mA) instrument signal only.

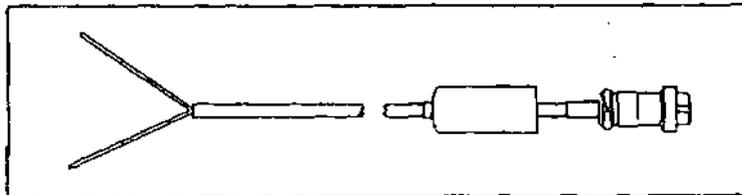


Figure 5: 2-Conductor Cable (P/N 33807)

PIN	WIRE	SIGNAL
3	White	+0-20 mA (+) Input
4	Black	-0-20 mA (-) Input

Table 1: Pin Out Table - milliAmp Input Cable

6.2 Optional 4-Pin Cable (P/N 33796)

The optional 4-pin external cable is used for connecting incoming pulse or pacing signals such as those triggered by a manual switch, reed switch, opto-coupler or by NPN or PNP transistors. The remote ON/OFF input is also accessed through the standard 4-pin connector.

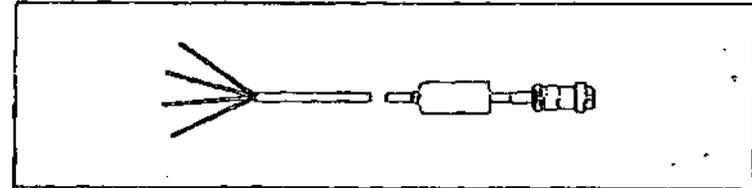


Figure 6: 4-Pin Cable (P/N 33796)

PIN	WIRE	SIGNAL
1	White	+15V Output
2	Black	Pacing input
3	Green	+15V Ground
4	Red	Remote ON/OFF & Computer Input

Table 2: Pin Out Table - 4-Pin Cable (P/N 33796)

6.3 Optional 8-Pin Cable (P/N 33738)

The optional 8-pin external cable assembly can be used to control stroke frequency in response to a 0 to 20 mA or 4 to 20 mA instrument signal. It provides an input for "flow monitoring." This cable assembly also provides output signals for pacing (pulse output), alarm (general) and computer alarm.



If a 0 to 20 or 4 to 20 mA signal is the only signal functioning, it is suggested that you use the Milliamp Input Cable, which is discussed on page 8.

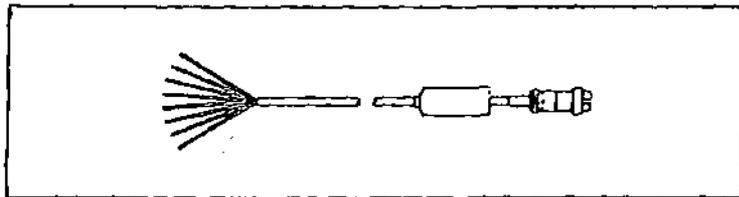


Figure 7: 8-Pin Cable (P/N 33738)

PIN	WIRE	SIGNAL
1	Red	+15V Output
2	Black	+15V Ground
3	Violet	+0-20 or 4-20 mA (+) Input
4	Green	-0-20 or 4-20 mA (-) Input
5	Orange	Pulse Output
6	Yellow	Alarm Output
7	Brown	Flow Input
8	Blue	Computer Alarm Output & Computer Output

Table 3: Pin Out Table - 8-Pin Cable (P/N 33738)

6.4 Optional "Hall Effect" Cable (P/N 33833)

An optional cable assembly is available for pacing your pump directly from an LMI Flowmeter fitted with a Hall Effect sensor. This cable connects to the Flowmeter as shown in Figure 8 (there is no need for a Programmable Divider, its function is built into the pump).

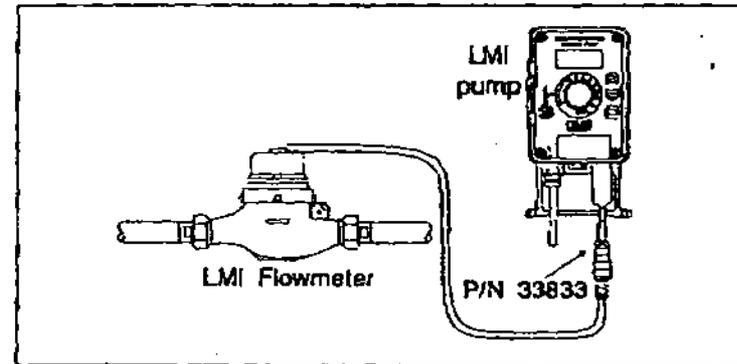


Figure 8: Optional "Hall Effect" Cable (P/N 33833)

6.5 LiquiComm™ Computer Interface Package

The optional LiquiComm™ package may be used to control and monitor up to 32 pumps from a computer over a serial RS485 interface as shown in Figure 9. Please contact LMI for further details.

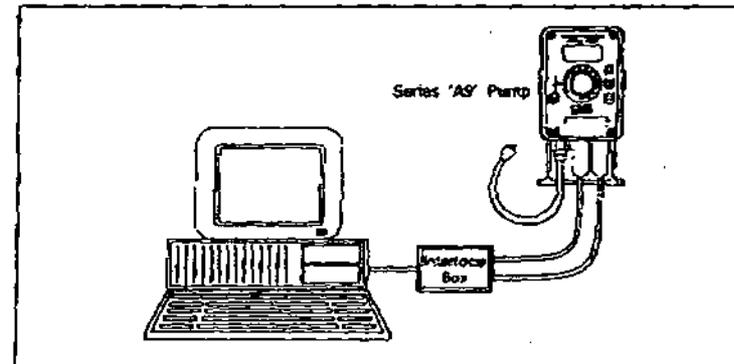


Figure 9: LiquiComm™ Computer Interface

7.0 Keypad/Display: Description and Function

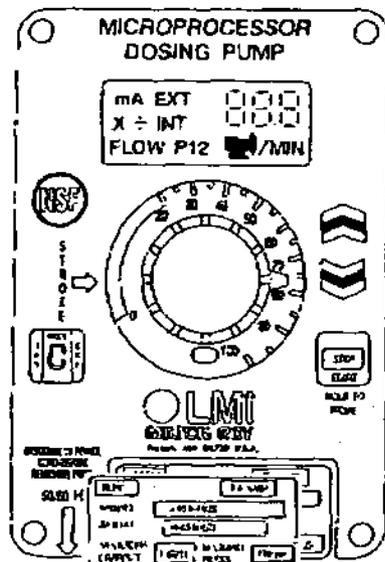


Figure 10: A9 Keypad

7.1 LCD Screen

The LCD screen is the window in which all values and menu choices are displayed (see Figure 11).

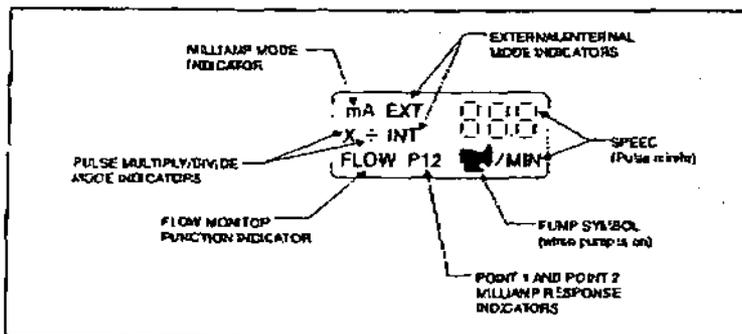


Figure 11: Liquid Crystal Display

7.2 Start/Stop



The  (Start/Stop) key turns the pump on or off. If the pump is not running, pressing this key will cause the pump to start running. The  symbol appears on the display while the pump is running. Each time the pump strokes, the  symbol clears. If the pump is running, pressing the  (Start/Stop) key will stop the pump. The  (Start/Stop) key is also used to prime the pump as described on page 15.

7.3 Up and Down Key



Use the  (Up) and  (Down) keys when: changing the stroke frequency; altering the pressure level; activating and deactivating the keypad lock; programming the divide and multiply values and milliamp response; accessing the setup menu; and changing certain parameters included in the setup menu. All of these functions are covered in greater detail later in this supplement.

7.4 Mode Key



Use the  (Mode) key when: changing to or from external or internal mode; accessing the pressure level; activating and deactivating the keypad lock; and accessing specific advanced features in the setup menu.

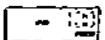
8.0 Operation of the Series A9, B9, and C9

These pumps feature EEPROM nonvolatile memory. The pump will always power up in the last used mode. When shipped from the factory the pump will power up in the "Internal" (manual) mode, with the pump OFF and a speed setting of 100 SPM.



If the power to the pump is cut less than 15 seconds after the last programmed values have been set, the latest changes will NOT be stored in nonvolatile memory. Allow at least 15 seconds before disconnecting from power to ensure that the latest changes are stored.

8.1 Pump Start/Stop

Press the  (Start/Stop) key to start or stop the pump. When the pump is OFF, the LCD screen will alternate between  and  every 16 seconds. When you start the pump, the  symbol appears on the LCD; . Each time the pump strokes, the  symbol disappears. Press the  (Start/Stop) key again to stop the pump.



"INT" signifies that the pump is in the "Internal" (Manual) mode.

8.2 Speed

The speed may be changed with the pump ON or OFF. To increase or decrease the speed, press or hold the  (Up) or  (Down) key. The range runs from 0 SPH to 100 SPM. While normally the speed will be set in SPM, if settings of SPH are desired, hold the  (Down) key until the display reads 0, then continue to hold it for an additional three (3) seconds. The display will then show H60, which is 60 SPH. The speed can be further reduced to 0 SPH with the  (Down) key.

For example:



8.3 Priming

The priming function allows a fixed-time prime period of one (1) minute and enables priming of the pump in either Internal or External control modes. The priming function overrides the need for an external signal to cause the pump to stroke while in the External mode. Press and hold the (Start/Stop) key  for three (3) seconds. The pump will start running at a speed of 60 SPM. If desired, alter the speed as noted above. The pump will stop one (1) minute from the time the  (Start/Stop) key was last pressed, or you can stop the pump by pressing the  (Start/Stop) key again. The display alternates between the pump speed and .



Flow Monitoring (see page 26) is inactive in the Prime mode.

8.4 Pressure Level Control

The maximum pressure rating of your pump can be adjusted to reduce pulsation shock in your discharge line. The pumps have a 6-point pressure control scale. The minimum setting is 0 and the maximum is 5. To access the pressure setting, press the  (Mode) key and  (Up) key at the same time and hold for two (2) seconds. The current pressure setting  may be altered using the  (Up) or  (Down) keys.

The pressure may be changed with the pump ON or OFF and in either Internal or External mode.

8.5 Keypad Lock

The pump has two (2) lock modes to prevent casual tampering. The small "LOC" de-activates all key functions *except*  (Start/Stop) and Prime. To activate this "LOC" mode, press the  (Mode) key and  (Down) key at the same time and hold for two (2) seconds. The LCD will read  for five (5) seconds and then return to the previous display. This display  re-appears when any key except the  (Start/Stop) key is pressed.

The large "LOC" disables *all* keypad entries, including Start/Stop. Activate this by pressing the Mode, Down, and Up keys at the same time and holding for two (2) seconds. The LCD will read  for five (5) seconds and then return to the previous display. This display  re-appears whenever any key is pressed.

lock all
keys press
"up" & "down"
at same time for
2 seconds

To de-activate either lock mode, press the  (Mode) key and  (Down) key at the same time, and hold for two (2) seconds. The  or  will disappear.

8.6 Low-Level Switch (P/N 29190 or 29190E)

When the Low-Level Switch is fitted to the pump and a fault condition exists, the "E1" error code will flash on the LCD screen





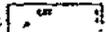
For more information on the Low-Level Switch, see the Low-Level Switch Assembly information sheet (P/N 1368) and page 30 of this supplement.

When a fault condition exists, the pump is stopped and the alarm and computer alarm lines are activated to allow remote monitoring. After clearing the fault (by filling the tank), the pump will automatically restart.

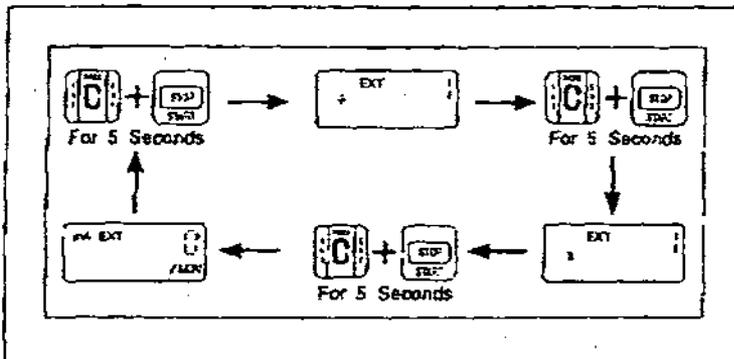
9.0 External Control Modes

To access the pulse divide, pulse multiply or milliamp response, the pump must be changed from Internal (manual) mode to External mode. To do this, first be sure the pump is stopped. Press the  (Mode) key and hold it for three (3) seconds. The LCD screen displays the last External mode that was programmed. If this is the first time the pump has been put in the External mode, the factory default will be displayed on the LCD screen. The factory default mode is "External Pulse Divide" with a divide value of one (1) . The display will alternate between SPM and OFF.

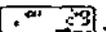
External Mode Select: Pulse Divide, Pulse Multiply, and mA Response

Any of three external modes may be selected when the pump is stopped by pressing and holding the  (Mode) key and  (Start/Stop) key for five (5) seconds, then releasing. As noted above, the default is Pulse Divide. Pressing and releasing these keys brings you to the Pulse Multiply mode . In this mode, the LCD screen alternates between the pulse multiply value and OFF. Pressing and releasing these keys one more time brings you to the third external mode, mA response . In this mode the LCD screen alternates between SPM and the mA value.

Summary of External Mode Select



9.1 Programming the Pulse Divide Value

The divide value is altered by using the  (Up) and  (Down) keys. To do this, the pump must be in the External Divide mode and be OFF. The valid range for the divide value runs from 1 to 999. With the pump running in the Divide mode, the speed in SPM is calculated based on the rate of incoming pulses and the divide value, and displayed on the LCD screen .

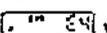
If the calculated speed is less than one (1) SPM, the LCD screen will display 0 SPM. If the calculated speed is GREATER THAN 100 SPM, the E3 error code will be displayed periodically until the fault condition is corrected



 This error does NOT activate the alarm output or stop the pump.

9.2 Programming the Pulse Multiply (Batch) Value

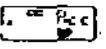
The multiply value is altered by using the  (Up) and  (Down) keys to change the value. The pump must be OFF and in the External Multiply mode. Like the divide value, the valid range for the multiply value runs from 0 to 999 pulses. When the pump is ON, a single external pulse will initiate a batch of pump strokes. The number of remaining pulses are displayed on the LCD screen . When 0 is reached, the display resets to the multiply value. The pump is now ready for another pulse input.

If a pulse is received before the countdown to 0 is complete, the E4 error code is displayed, and the pump batch count resets to the programmed multiply value. The batch countdown then continues from its programmed value. As the countdown continues, the E4 error code  will be displayed intermittently until the fault is corrected. The strokes that remained from the first batch are NOT accounted for. To clear the fault display, the pump must be stopped and restarted.



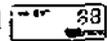
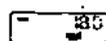
To allow true flow proportioning, the speed in the Multiply mode is equal to the speed set in the Internal (manual) mode. That is, if the Internal mode speed is set at 60 SPM, in the External Multiply mode the pump counts down at 60 SPM.

Batch Accumulate

The Batch Accumulate function allows you to opt to have any extra input pulses received in the multiply mode accumulate up to a maximum batch of 999. If Batch Accumulate is enabled and a pulse is received during the countdown, the programmed multiply value will be added to the current displayed value. Pulses causing the maximum batch of 999 to be exceeded will result in an E4 error message. When Batch Accumulate is enabled, the LCD screen alternates between the current multiply value and "ACC" . The Batch Accumulate function is activated in the Setup Menu (see "Advanced Features and Setup Menu" on page 25).

9.3 Programming the mA Response

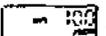
The pump accepts a 0-20 mA or 4-20 mA signal directly. The response to this signal is fully programmable. In the mA mode, the pump speed is determined by the programmed response curve, as defined by points "P1" and "P2." The factory default set values for P1 and P2 are (4 mA, 0 SPM) and (20 mA, 100 SPM) respectively. This is illustrated in Figure 12.

While in the mA mode, the pump speed  and the mA value  are displayed alternately every four (4) seconds while the pump is running.

9.4 Programming Points 1 and 2 (SPM)

To program points P1 and P2, first ensure the pump is in the mA mode and OFF. If you wish to program the response in "SPM",

switch to the internal mode. The speed must be set to a SPM value

. Return to the External mA mode.

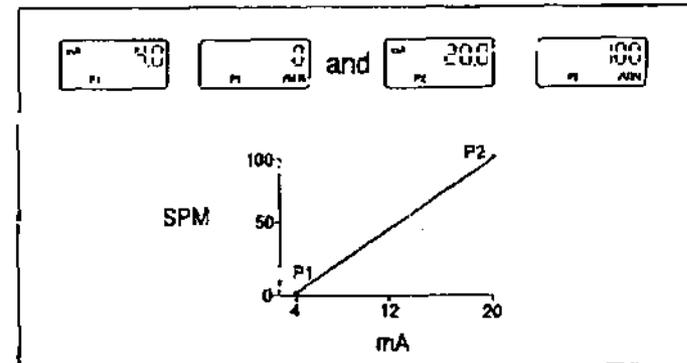
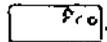
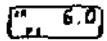
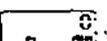
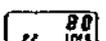
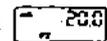
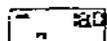
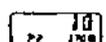


Figure 12

Press either the  (Up) or  (Down) key. The LCD screen will display . After five (5) seconds, the display will show the mA value for P1 . This value may be altered using the  (Up) or  (Down) key within five (5) seconds (i.e. ). Five (5) seconds following the last key press, the stroke rate for P1 will be displayed . This value may be altered within five (5) seconds using the Up or Down key (i.e. ).

Five (5) seconds after the last key press, the mA value for P2 is displayed . Edit as described in the above paragraph (i.e. ). Likewise, five (5) seconds after the last key press the stroke rate for P2 is displayed. Edit as described above (i.e. ).

The above examples would result in the inverse control profile shown in Figure 13.

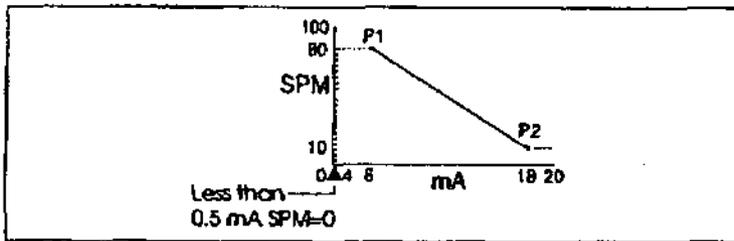


Figure 13

If the mA input goes below the value programmed for P1 or above the P2 value, the response will "plateau," as indicated by the dotted lines above.



The valid input range is from 0.5 to 21 mA. Below 0.5 mA, the pump will be off. Above 21 mA, the E5 error code will be displayed intermittently .

9.5 Programming Points 1 and 2 (SPH)

If you wish to program the response in strokes per hour, start by being in the External mA mode. Next, switch to the Internal mode. If the Internal setting is in strokes per minute, change to strokes per hour by holding the (Down) key until the display reads 0 SPM. Continue to hold it for another three (3) seconds. The display will now read SPH . Set the speed to any SPH value (the actual setting has no bearing on mA response). Return to the External mA mode.

In the External mA mode, pressing the (Down) key or (Up) key will change the display to . After five (5) seconds, the display will show the mA value for P1 . This value may be altered by using the (Up) key or (Down) key within five (5) seconds (i.e.). Five (5) seconds following the last key press, the stroke rate for P1 will be displayed . This value may be altered within five (5) seconds using the (Up) or (Down) key (i.e.).

Five (5) seconds after the last key press, the mA value for P2 will be displayed . Edit as described above (i.e.). Likewise, five (5) seconds after the last keypress, the stroke rate for P2 is displayed and may be altered as above (i.e.).

The above example would result in the inverse control profile shown in Figure 14.

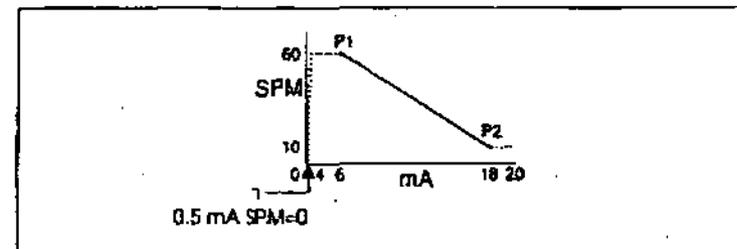


Figure 14



The valid input range is from 0.5 to 21 mA. Below 0.5 mA, the pump will be off. Above 21 mA, the E5 error code will be displayed intermittently .



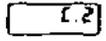
When programming strokes per hour, the maximum rate is 60. P1 and P2 must BOTH BE SPM or BOTH BE SPH.

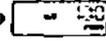
10.0 Advanced Features and the Setup Menu

Advanced features such as Batch Accumulate, Computer Interfacing, Automatic Voltage Compensation, Flow Monitoring and Integral Blowdown may be selected and altered in the Setup Menu of the Series A9, B9, and C9. The following configuration chart describes each menu item, its description, and available settings.

Menu Item	Description/Function	Setting	Notes
	Software Revision	Read Only	
1	Batch Accumulate	0 = Disable 1 = Enable	Applies to External Multiply mode
2	Computer Communication	0 = Disable 1 = Enable	Allows computer interface to be established with LiquiComm™ software. Remote Start/Stop and Computer Alarm lines are used in communication.
3	Automatic Voltage Compensation	0 = Disable 1 = Enable	Becomes active two (2) minutes after power up.
4	Flow Monitoring	0 = Disable 1 = Enable	Used in conjunction with FM-200 Digi-Pulse™ Flow Monitors. "Flow" displayed and flashes with each pulse from FM-200.
5	Flow Monitoring Pulse Detection Pulse Detection Setting	1 to 255	Sets the number of missing pulses before alarm output is activated. Menu item number is not included with LCD display. This setting is displayed irrespective of Menu Item 4 setting.
6	Input Pulse Width	0-15	Allows pulse widths of 1 to 60 mSec to be set. Setting of 0 gives a debounce time of approximately 1 mSec.
7	Integral Blowdown	0 = Disable 1 = Enable	Allows Activation of the integral blowdown feature.
8	Integral Blowdown Solenoid ON Time (Seconds)	0 to 255	Set solenoid ON time in seconds.
9	Integral Blowdown Pump ON Time (Seconds)	0 to 255	Set pump ON time in seconds.
<p><i>Note:</i> Allow 15 seconds after programming before disconnecting from power to ensure latest changes are stored in non-volatile memory.</p>			

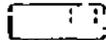
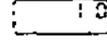
10.1 Accessing the Setup Menu

To access the Setup Menu, ensure that the pump is OFF and in the Internal mode. Using the  (Up) key, bring the stroke rate to 100 SPM. At this point, keep the  (Up) key pressed for five (5) seconds. The LCD screen then displays the current software revision, indicating that you have entered the Setup Menu mode . Press the  (Mode) key to scroll through the Menu Items. Use the  (Up) or  (Down) key to enable or disable menu functions and program values.

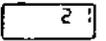
To exit the Menu mode, press the  (Start/Stop) key. Or, if no keys are pressed for 13 seconds, the display reverts to .

10.2 Menu Items

10.2.1 Menu Item 1: Batch Accumulate Enable/Disable

Batch Accumulate may be enabled (1)  or disabled (0) . Use the  (Up) or  (Down) key to change the selection.

10.2.2 Menu Item 2: Computer Communication

Press the Mode key to get to Menu Item 2, Computer Communication. Setting the value to one (1)  enables computer communication using the LiquiComm™ Interface Box and Software.



When Computer Communication is enabled, the Remote Start/Stop and Computer Alarm lines are deactivated and used for the computer communication link.

10.2.3 Menu Item 3: Automatic Voltage Compensation
Menu Item 3 enables (1) or disables (0) automatic voltage compensation. This unique feature allows a constant power level to be delivered to the EPU of the pump, even when the voltage of the external power source is fluctuating. This results in smooth pump output in spite of fluctuating voltage and prevents overheating.



Automatic voltage compensation becomes active two minutes after power up.

10.2.4 Menu Items 4 and 5: Flow Monitoring
This feature is used in conjunction with the LMI Series FM-200-9 Digi-Pulse™ Flow Monitor (refer to Digi-Pulse™ Flow Monitor Instructions P/N 1708). This device is designed to monitor the output flow from a pump. It may be set to deliver a pulse signal output for each successful pump stroke registered. If the flow stops or lessens, the pulse outputs will cease. With the FM-200-9 connected to the flow monitor input, the presence or lack of pulses can be detected (see Figure 15).

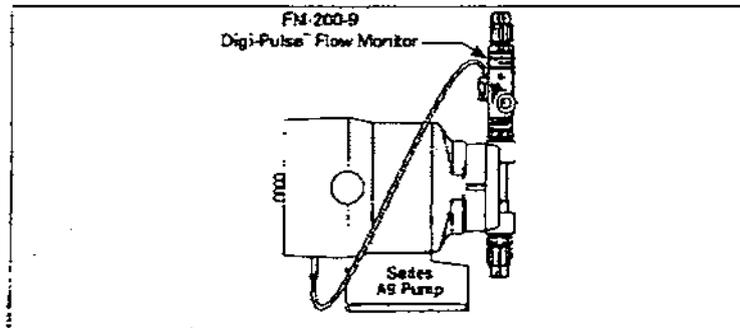


Figure 15

Press the (Mode) key a fourth time and then the (Up) or (Down) key to allow flow monitoring to be enabled (1) or disabled (0). When flow monitoring is enabled, "Flow" is displayed on the LCD screen. Again, pressing the (Mode) key displays the number of missing pulses to be detected. This may be set to any value from 1 to 255. The factory default is 8. A setting of 1 is the most sensitive, a setting of 255 the least sensitive.

For example, if the setting is 5, and five (5) strokes of the pump occur without any pulse being received from the FM-200-9, the LCD screen will display an E2 error code. The pump will stop, and the alarm outputs will be activated (i.e.). Pressing the (Start/Stop) key clears the error.



The word "Flow" blinks every time the A9, B9, or C9 receives a signal from the Digi-Pulse™. This serves as an aid in setting up the Digi-Pulse™ itself.

10.2.5 Menu Item 6: Input Signal Pulse Width (Debounce)
Menu Item 6 determines the "debounce" period (pulse width) to be applied to incoming pulse (pacing) signals. The default value is 15, which corresponds to a debounce value of 60 mSec . Each unit corresponds to approximately 4 mSec. This means that in order to be recognized, an input signal must be at least 60 mSec in duration. This setting may need to be reduced from its maximum setting for high frequency input pulse signals such as those from a Hall Effect flowmeter.

10.2.6 Menu Items 7, 8 and 9 Activate the Integral Blowdown Feature

These Menu Items will require additional accessories and customer supplied components. For complete details please refer to A9, B9 and C9 with Integral Blowdown (P/N 1753).

This Integral Blowdown feature provides cooling tower control from your LMI microprocessor pump when used in conjunction with a pulse output type flowmeter (batch mode) or 4-20 mA signal (milliamp mode). These signals can then be input into the pump to provide activation of both the pump and a customer supplied solenoid valve.



LMI's Relay Pack, Model RP-100A, must be ordered separately to provide power to the customer supplied solenoid.

A. Batch Mode

Programming Menu

Menu Item 1 Batch Accumulate: Select 0 = (Disable) or 1 = (Enable)

Menu Item 7 Integral Blowdown: Select 1 = (Enable)

Menu Item 8 Solenoid ON time: Select 0 to 255 (Seconds)

Select "INT" mode and set the manual strokes per minute.

Select "EXT X" (multiply) mode (batch mode) and program stroke count.

On receipt of a pulse from the flowmeter, the pump strokes the programmed number of pulses. The batch value (multiply [X] value) and manual SPM determines the length of time the pump will be on.

On receipt of a pulse from the flowmeter, the solenoid valve is opened. The solenoid remains open for the length of time programmed in Menu Item 8. If another flowmeter pulse is received before the above is completed the solenoid ON time is extended by the time programmed in Menu Item 8.

B. Milliamp Mode

Programming Menu

Menu Item 7 Integral Blowdown: Select 1 = (Enable)

Menu Item 8 Solenoid ON time: Select 0 to 255 (seconds)

Menu Item 9 Pump ON time: Select 0 to 255 (seconds)

Select EXT mA mode (milliamp mode) and program the mA response (Point 1 and Point 2).

The pump strokes at a rate determined by the mA input signal for the length of time determined by Menu Item 9. The solenoid remains open for the length of time programmed in Menu Item 8 of the menu. The cycle time for this operation is determined by the longer of solenoid ON time or the pump ON time.

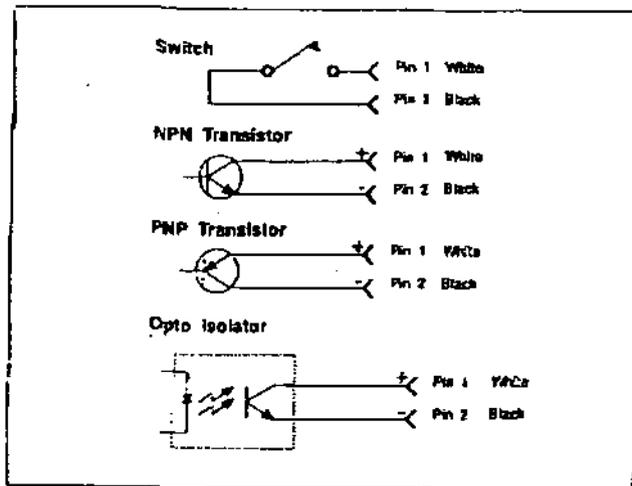
Appendix A: Input/Output Description

4-Pin Connector

Pacing (Pulse) Input / Opto-isolated Input

Methods of Triggering Series A9, B9, and C9 Pumps

Reference: 4-Pin Cable (P/N 33796)



Switch or transistor must be capable of switching 2 mA at 15 VDC. When in the Divide mode, the switch must close then open to trigger.

Minimum time in low impedance state (i.e. switch closed) is 60 mSec by default.

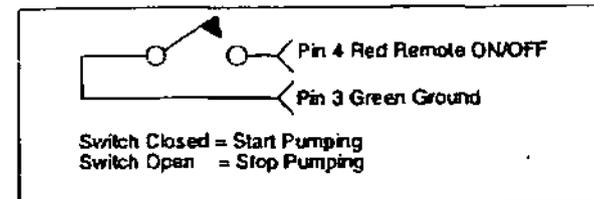
Setup Menu Item 6 sets this value in multiples of 4 mSec.

Example: Default = $4 \times [15] = 60 \text{ mSec}$

Remote On/Off (Opto-isolated Input)

Switching this line to ground starts the pump. Releasing this line, stops the pump. The (Start/Stop) key will always override the Remote Start/Stop.

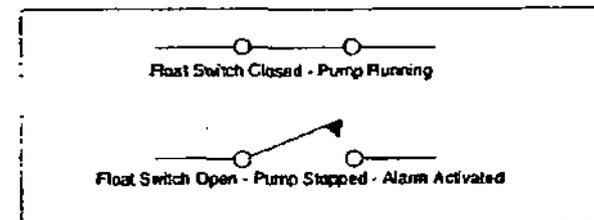
Reference: 4-Pin Cable (P/N 33796)



Switch must be capable of switching 2 mA at +15 VDC. Minimum time in low impedance state (i.e. Switch closed) is approximately one (1) second.

Low-Level Input (P/N 29190 and 29190E)

Opening the float switch (i.e. breaking the line from ground) stops the pump and activates the alarm output.



Switch must be capable of switching 2 mA at +15 VDC.

Minimum time in low impedance state (i.e. switch closed) is approximately 1 second. (For use with LMI Float Switches [P/N 29190 and 29190 E]. For further information, please refer to instructions included with the switches and to page 17 of this supplement.)

8-Pin Connector

Analog 0-20 mA Input

+0 to 20 mA White
-0 to 20 mA Black

+0 to 20 mA Violet
-0 to 20 mA Green

This is reverse polarity protected with a 22 Ohm impedance, a resolution of 0.1 mA and an accuracy of +/- 0.2 mA typically.

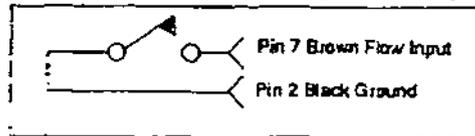
Flow Input (Opto-isolated Input)

(See also Flow Monitoring on page 26)



If an FM-200-9 is used, use the Digi-Pulse™ phone jack. If some other device is used, this function can be accessed as shown below.

Reference: 8-Pin Cable (P/N 33738)



Switch must be closed for approximately three (3) mSec and then open for the input to be accepted (i.e. switch to ground, then release).



Switch must be capable of switching 2 mA at +15 VDC.

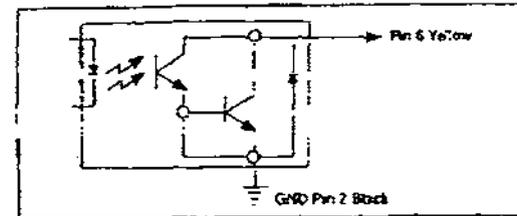
15V Output

The +15V Output (pin 1 Red) is regulated and capable of delivering 30 mA current.

Alarm Output

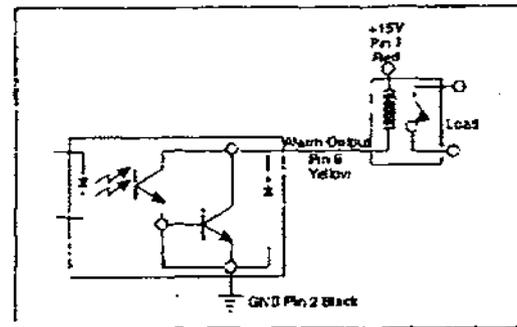
This is an opto-isolated open collector Darlington pair capable of switching 25 mA at +24 VDC to within 1V of ground typically.

Reference: 8-Pin Cable (P/N 33738)



The output pair turns ON when an alarm condition occurs (i.e. low level or missing pulse) and remains ON until the alarm condition is cleared.

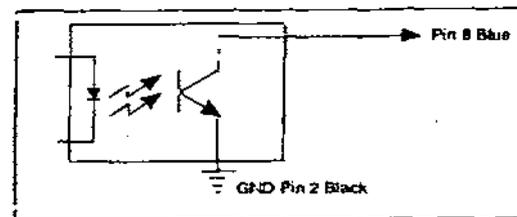
Application: Relay Switching



Computer Alarm Output

This is an opto isolated, open collector output capable of switching 2 mA at +24 VDC to within 0.4V of ground typically.

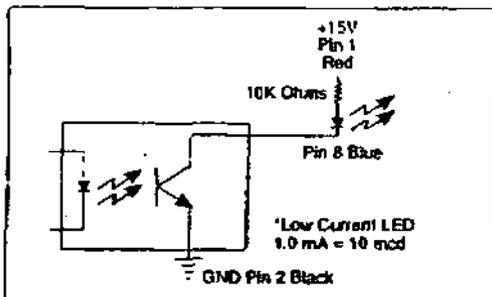
Reference: 8-Pin Cable (P/N 33738)



This output tracks the alarm output (i.e. the conditions for activating and de-activating this output are the same as for the alarm output).

This output may be used to directly switch small loads such as computer inputs and low current LEDs. It may also be used to initiate switching of larger loads if suitable buffer circuitry is provided.

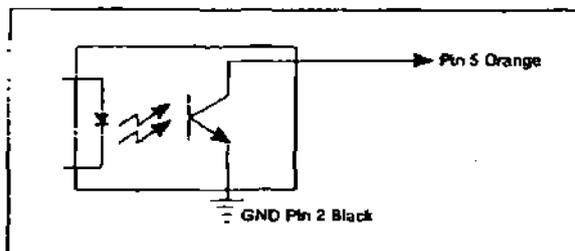
Application: Low Current LED Switching



This is an opto-isolated, open collector output capable of switching 2 mA at +24 VDC to within 0.4V of ground typically.

Pacing Output (Opto-isolated Output)

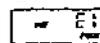
Reference: 8-Pin Cable (P/N 33738)



The output transistor turns ON at the start of a stroke and remains ON for approximately 100 mSec.

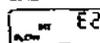
Appendix B: Summary of Error Messages

E1



is caused by a Low-Level fault with a Low-Level Switch connected to the pump. The pump is stopped and the alarm outputs are activated. This operates in all Internal and External modes. The pump automatically restarts when the fault is cleared.

E2



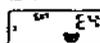
indicates that the pump has lost prime (or the flow had reduced) when an FM200-9 is connected and Flow Monitoring is enabled. Again, the pump is stopped and output alarms activated. Restart the pump when the fault is cleared.

E3



is displayed in the External mode if the stroke rate exceeds 100 SPM. The pump is NOT stopped and NO alarm outputs are activated with this fault. To stop E3 flashing, clear the fault condition, then stop and restart the pump.

E4



is displayed in the External X (Batch) mode in two situations: 1) If "Batch Accumulate" is disabled and a pulse signal is received while the pump is counting down. The pump is not stopped, and the alarms are not activated. To clear the E4 message, the pump must be stopped and restarted. 2) If "Batch Accumulate" is enabled and the cumulative batch value exceeds 999, E4 will be displayed. The E4 message can only be cleared if the pump is stopped and restarted.

E5



is displayed in the mA External mode if the mA input value exceeds 21.0 mA, whether the pump is running or stopped. Again, the alarms are NOT activated. Once the mA signal goes below 21.0 mA, the E5 error message is cleared.

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 LMI <small>LIQUID METRONICS INCORPORATED</small> MILTON ROY <small>A unit of Transponder Corporation</small>	3 Pool Office Square Acton, MA 01720 USA TEL: (978) 263-8800 FAX: (978) 264-8172 http://www.lmipumps.com
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Liquid Metronics, Inc.

Sludge Measuring Optical Gauge (SMOG)



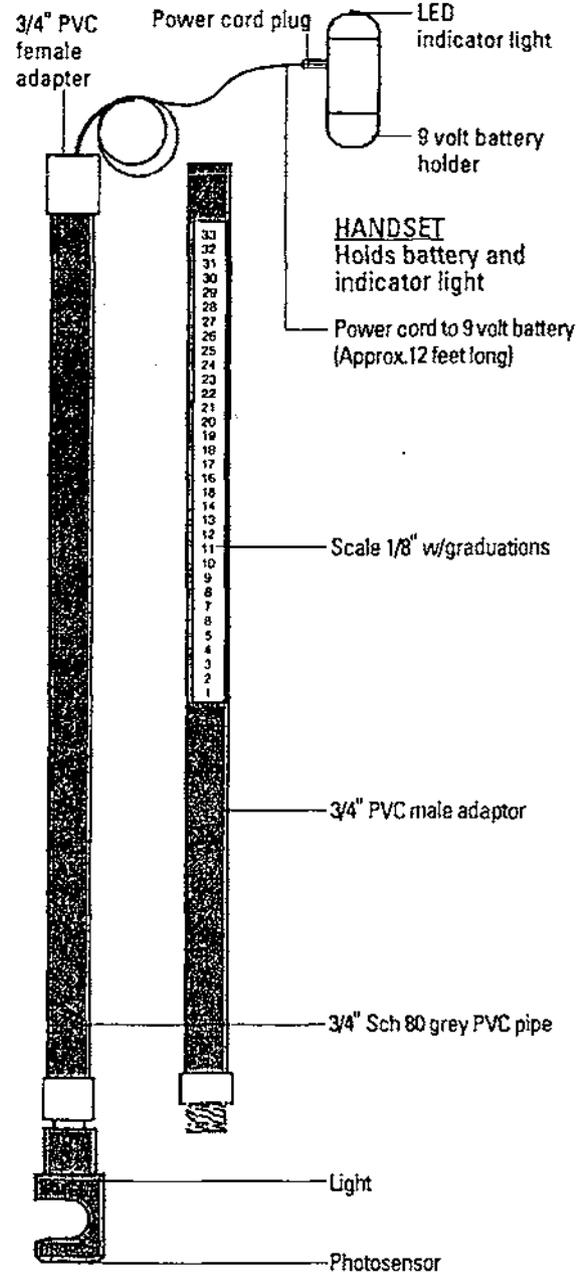
Orengo Systems
Incorporated

1-800-348-9843

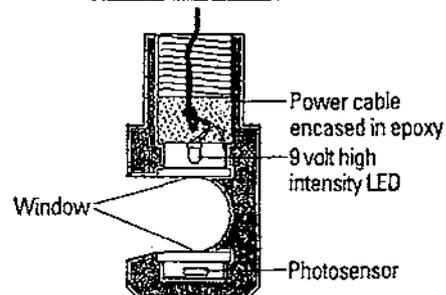
Assembly and Operation Instructions

- To assemble the SMOG, thread the wire from the 6' bottom section through the 4' extension. Screw the 4' extension onto the top of the 6' section.
- The light in the handset and in the light end of the gauge are turned on when the power cord plug is plugged into the handset.
- When the scum blanket is hard, a hole may be made by gently probing first with Orengo's Scum Measuring Utility Gauge (see Instructions on back).
- Special care must be exercised while penetrating the scum blanket to insure that the gauge windows do not become blinded. Gently rotating the optical gauge back and forth between your thumb and index finger while lowering it through the scum blanket will help to assure the windows remain clear of scum. Once the light is below the scum layer and in the clear zone, continue the rotating motion while slowly lowering it to the sludge layer. Rotating will help to draw the sludge layer in between the windows. As you lower the gauge, watch the LED indicator light in the handset.
- When the light in the handset goes dark, stop and record your reading on the gauge's scale at a reference point, typically the top edge of the riser or the tank. Then continue lowering until the gauge makes contact with the tank bottom. Make a second reading on the scale using the same reference point.
- The sludge depth is equal to the difference between the two scale readings plus the depth of the bottom window (approximately 3/4").
- Measure the depth at several locations, taking care to disturb the sludge layer as little as possible. Sludge layers will vary from very dense to nearly buoyant.
- If possible, measure the sludge at several locations in the tank to get a good average.
- Refer to the Sludge and Scum Monitoring Form for recommended locations where measurements should be reported.

(continued on back)



LIGHT END DETAIL



APPENDIX H

FILTRATION SYSTEM MANUFACTURER'S DOCUMENTATION

APPENDIX I

GAC SYSTEM MANUFACTURER'S DOCUMENTATION

APPENDIX J
SCHEDULED MAINTENANCE CHECKLISTS

Maintenance Schedule For Storm Water Treatment Plant

Daily

1. Grease the four pillow block bearings on the 1200 G.P.M. wet well pump. Grease fittings located on base of pump stand.
2. Test over flow alarm strobe light by pushing test button.
3. Check oil level in mixer gear boxes.
4. Check chemical levels and make mix if necessary
5. Check filter bag differential pressures and change filters if pressure differential pressure reaches fifteen pounds.
6. Check carbon unit differential pressures and backwash if pressures reach seventeen pounds.
7. Check oil level in the air compressor

Weekly

1. Grease the four pillow block bearings on the 3000 G.P.M. wet well pump.
2. Check oil level in the small filter supply pump and add if necessary

Monthly

1. Grease bearings on small wet well pump motor
2. Grease bearings on small storage tank transfer pump
3. Grease bearings on air compressor motor
4. Grease bearings on tank mixer bearings
5. Grease bearings on small filter pump motor
6. Activate valves on carbon unit manifold while unit is not in operation
7. Start up 3000 G.P.M. wet well pump in manual mode, let run for one minute and place back in the auto mode.

90 Day

1. Change oil in the air compressor
2. Grease bearings on 100 H.P. motor on wet well pump
3. Grease bearings on motor of big filter supply pump
4. Grease bearings on motor of backwash supply pump
5. Grease bearings on motor of big storage tank transfer pump

Annually

1. Replace bearings and belt on small wet well pump and motor
2. Replace bearings on big wet well pump
3. Replace bearings on mixers
4. Reseal and change oil in mixer drives
5. Change oil in small filter supply pump drive
6. Replace rotary seals in all pumps
7. Perform annual maintenance on Storage Tank as recommended by Columbian Steel Tank (see Appendix F of O&M Manual)
8. Change hydraulic oil and oil filter on filter press

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TAYLOR LUMBER & TREATING, INC. - TREATING PLANT
 Stormwater Treatment System
 Daily & Weekly Scheduled Maintenance Checklist

Month/Year _____

Page 1 of 1

Feature	Maintenance Criteria	Check When Maintenance Completed																																	
		Daily																																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
1200 GPM Wet Well Pump	Grease pillow block bearings & fittings on base of pump stand																																		
Overflow Alarm Strobe Light	Test alarm by pushing test button																																		
Mixer Gear Boxes	Check oil level. Add when necessary																																		
Bag Filters 1 - 4	Check differential pressure. Change filters when differential pressure reaches 15 pounds	Check Box If Changed	#1																																
			#2																																
			#3																																
			#4																																
GAC Vessels 1 & 2	Check differential pressure. Backwash when differential pressure reaches 17 pounds	Check Box If Backwashed	#1																																
			#2																																
Air Compressor	Check oil level. Add when necessary																																		
Precipitant Drum	Check level. Replace Drum if necessary																																		
Coagulant Drum	Check level. Replace Drum if necessary																																		
Polymer Tank	Check level. Make mix if necessary																																		
		Weekly																																	
3000 GPM Wet Well Pump	Grease pillow block bearings	Required Weekly																																	
Small Filter Supply Pump	Check oil level. Add when necessary																																		
Name of Maintenance Person																																			
	Initial Days Maintenance Performed																																		

Supervisors Signature _____ Date _____

TAYLOR LUMBER & TREATING, INC. - TREATING PLANT
 Stormwater Treatment System
 Monthly Maintenance Checklist

YEAR _____

Feature	Maintenance Criteria	Check When Maintenance Completed												
			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Small Wet Well Pump	Grease Bearings													
Small Storage Tank Transfer Pump	Grease Bearings													
Air Compressor	Grease Bearings													
Tank Mixer	Grease Bearings													
Small Filter Pump	Grease Bearings													
Carbon Unit Manifold	Activate Valves while unit is not in operation													
3000 GPM Wet Well Pump	Start up in manual mode. Let run for one minute. Return to auto mode.													

Name of Maintenance Person

Name of Maintenance Person															
	Initial Month Maintenance Performed														

Supervisors Signature _____

Date _____

TAYLOR LUMBER & TREATING, INC. - TREATING PLANT
 Stormwater Treatment System
 Quarterly Maintenance Checklist

YEAR _____

Feature	Maintenance Criteria	Enter Date When Maintenance Completed			
		1st Quarter Jan - Mar	2nd Quarter Apr - Jun	3rd Quarter Jul - Sept	4th Quarter Oct - Dec
Air Compressor	Change oil				
100 HP Wet Well Pump	Grease bearings on motor				
Large Filter Supply Pump	Grease bearings on motor				
Backwash Supply Pump	Grease bearings on motor				
Large Storage Tank Transfer Pump	Grease bearings on motor				

Name of Maintenance Person

	Initial Quarter Maintenance Performed				

Supervisors Signature _____

Date _____

TAYLOR LUMBER & TREATING, INC. - TREATING PLANT
 Stormwater Treatment System
 Annual Maintenance Checklist

YEAR _____

Feature	Maintenance Criteria		Enter Date Plus Any Additional Maintenance Performed
Small Wet Well Pump	Replace bearings and belt		
Large Wet Well Pump	Replace bearings		
Mixers	Replace bearings		
Mixer Drives	Reseal and change oil		
Filter Supply Pump	Change oil		
All Pumps	Replace rotary seals		
Storage Tank	Annual maintenance as recommended by Columbian Steel Tank (See Appendix F of O & M)		
Filter Press	Change hydraulic oil and oil filter		

Name of Maintenance Person

Supervisors Signature

Date

APPENDIX K
MATERIAL SAFETY DATA SHEETS

MATERIAL SAFETY DATA SHEET

HMP-100

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER: CTL Services Company
12929 SE Division
Portland, OR 97236

INFORMATION PHONE: (503) 722-2272

For Medical and Chemical Emergencies
call INFOTRAC at: 1-800-535-5053

PRODUCT NAME: HMP-100

MSDS NUMBER: MSDS-00656

DATE PREPARED: 10/24/00

LAST REVISION: 10/24/00

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS #	OSHA PEL	ACGIH TLV	Weight %
SODIUM DIMETHYLDITHIOCARBAMATE	128041	NE	NE	<40

3. HAZARDOUS IDENTIFICATION

EMERGENCY OVERVIEW: N/A

POTENTIAL HEALTH EFFECTS

EYE CONTACT: May cause irritation

INHALATION: Irritating to the nose, throat, and respiratory tract.

INGESTION: Nausea, vomiting, or diarrhea may result from ingestion.

SKIN CONTACT: May cause irritation.

SIGNS AND SYMPTOMS OF EXPOSURE: N/A

4. FIRST AID MEASURES

EYE CONTACT: Immediately flush eyes with water for at least 15 minutes. Hold eyelids open while flushing the eyes. Get medical attention.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

INGESTION: If swallowed, dilute with water and get medical attention. Never give anything by mouth to an unconscious or convulsing person.

SKIN CONTACT: Wash with soap and water. Change contaminated clothing. Get medical attention if irritation develops or persists.

AGGRAVATED MEDICAL CONDITIONS: Pre-existing eye, skin or respiratory conditions.

SUPPLEMENTAL HEALTH INFORMATION:

N/A

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT: >200 deg F

FLASH POINT METHOD USED: Pensky-Martens

AUTOIGNITION: N/A

LEL:

UEL:

EXTINGUISHING MEDIA:

Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES:

Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece in positive pressure mode. Move containers from fire area if it can be done without risk. Use water to keep fire-exposed containers cool.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

May form flammable by-products on contact with strong acids and/or extreme heat.

COMBUSTION PRODUCTS:

N/A

6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS SPILLED OR RELEASED:

Small spills: Mop up, wipe up or soak up immediately. Remove to out of doors. Large spills: Evacuate area. Contain liquid; transfer to closed poly containers. Keep out of water supply.

7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Protect from freezing. Store away from acids. Follow all MSDS/label precautions even after container is emptied because it may retain product residues.

OTHER PRECAUTIONS:

For industrial use only. Keep away from children. Keep containers closed while not in use.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION: Wear a NIOSH/MSHA approved respirator appropriate for vapor concentration at point of use.

PROTECTIVE GLOVES: Rubber or other impervious material with gauntlets.

VENTILATION: Local exhaust sufficient to keep exposure below TLV.

WORK / HYGENIC PRACTICES: Use good personal hygiene when handling this product. Wash hands after use, before smoking, or using the toilet.

ENGINEERING CONTROLS: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

EYE PROTECTION: Safety glasses with side shields (or goggles).

OTHER PROTECTIVE EQUIP: Boots, apron, lab coat or coveralls of impervious material, safety shower, eyewash.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Yellow-green to amber solution with slight sulfide odor.

SOLUABILITY IN WATER: Complete

EXPOSURE GUIDELINES: N/A

BOILING POINT: N/A

PH: 11.8

VAPOR PRESSURE: 13 mm Hg @ 25deg C

VAPOR DENSITY: N/A

SPECIFIC GRAVITY: 1.18

POUNDS PER GALLON:

PHYSICAL STATE: Liquid

OTHER PROPERTIES: N/A

MELTING POINT: N/A

10. STABILITY AND REACTIVITY

STABLE: Stable

CONDITIONS TO AVOID:

Acidification releases flammable gases

INCOMPATIBILITY:

Strong Acidic and Strong Oxidizing Compounds

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:

Hydrogen sulfide may be produced if heated to high temperatures. Carbon disulfide may be produced on contact with strong acids. Dimethylnitrosamines may be produced on contact with a combination of strong acids and nitrosating compounds.

HAZARDOUS POLYMERIZATION: Will Not Occur

CONDITIONS TO AVOID: None Known

11. TOXICOLOGICAL INFORMATION

All components of this product are listed in the Toxic Substances Control Act inventory.

12. ECOLOGICAL INFORMATION

N/A

13. DISPOSAL CONSIDERATIONS

Consult appropriate Federal, State, or Local regulatory agencies to ascertain proper disposal procedures.

14. TRANSPORT INFORMATION

DOT CLASS: Non-Regulated Material, Liquid

HAZARD CLASS: N/A

UN NUMBER: N/A

PACKING GROUP: N/A

GUIDE NUMBER: N/A

PROPER SHIPPING NAME: Non-Regulated Material, Liquid

15. REGULATORY INFORMATION

16. OTHER INFORMATION

HMIS INFORMATION:	HEALTH: 2	FLAMMABILITY: 0	REACTIVE: 0	PROTECTIVE: C
NFPA INFORMATION:	TOXICITY: 2	FIRE: 0	REACTIVITY: 0	SPECIAL: N

CTL Services Company expressly disclaims all express or implied warranties of merchantability and fitness for a particular purpose, with respect to the product or information provided herein.

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MATERIAL SAFETY DATA SHEET

WT-500

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER: CTL Services Company
12929 SE Division
Portland, OR 97236

INFORMATION PHONE: (503) 722-2272

For Medical and Chemical Emergencies
call INFOTRAC at: **1-800-535-5053**

PRODUCT NAME: WT-500

MSDS NUMBER: MSDS-00664

DATE PREPARED: 10/31/00

LAST REVISION: 10/31/00

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS #	OSHA PEL	ACGIH TLV	Weight %
ALUMINUM SULFATE	10043013	N/A	TLV = 2mg/M3 as ALUMINUM	<50%

3. HAZARDOUS IDENTIFICATION

EMERGENCY OVERVIEW: N/A

POTENTIAL HEALTH EFFECTS

EYE CONTACT: May cause irritation or damage to the eyes.

INHALATION: Irritating to the nose, throat, and respiratory tract.

INGESTION: Swallowing this product can be irritating and may cause damage to the gastrointestinal tract.

SKIN CONTACT: May cause irritation or damage to the skin.

SIGNS AND SYMPTOMS OF EXPOSURE: Irritation, pain, coughing, redness of skin.

4. FIRST AID MEASURES

EYE CONTACT: Immediately flush eyes with water for at least 15 minutes. Hold eyelids open while flushing the eyes. Get medical attention.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

INGESTION: If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious or convulsing person. Get medical attention immediately.

SKIN CONTACT: Wash with soap and water. Change contaminated clothing. Get medical attention if irritation develops or persists.

AGGRAVATED MEDICAL CONDITIONS: Pre-existing eye, skin or respiratory conditions.

SUPPLEMENTAL HEALTH INFORMATION:

The effects of long-term, low-level exposure to this product have not been determined. Safe handling of this material on a long-term basis should emphasize the avoidance of all effects from repetitive acute exposures.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT: None

FLASH POINT METHOD USED: N/A

AUTOIGNITION: N/A

LEL:

UEL:

EXTINGUISHING MEDIA:

Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES:

Wear full protective clothing and a NIOSH-approved self-contained breathing apparatus with full face piece operated in a pressure positive mode.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Thermal decomposition of product may release toxic and/or hazardous gases.

COMBUSTION PRODUCTS:

N/A

6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS SPILLED OR RELEASED:

Small spills: Mop up, wipe up or soak up immediately. Remove to out of doors. Large spills: Evacuate area. Contain liquid; transfer to closed poly containers. Keep out of water supply.

7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Protect from freezing. Follow all MSDS/label precautions even after container is emptied because it may retain product residues.

OTHER PRECAUTIONS:

For industrial and laboratory use only. Keep away from children. Keep containers closed while not in use.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION: Wear a NIOSH/MSHA approved respirator appropriate for vapor concentration at point of use.

PROTECTIVE GLOVES: Rubber or other impervious material with gauntlets.

VENTILATION: Local exhaust sufficient to keep exposure below TLV.

WORK / HYGENIC PRACTICES: Use good personal hygiene when handling this product. Wash hands after use, before smoking, or using the toilet.

ENGINEERING CONTROLS: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

EYE PROTECTION: Use chemical safety goggles and/or full face shield where splashing is possible. Contact lenses should not be worn when working with this material. Maintain eye wash fountain and quick-drench facilities in work areas.

OTHER PROTECTIVE EQUIP: Boots, apron, lab coat or coveralls of impervious material, safety shower, eyewash.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Clear light green or amber liquid. Odorless

SOLUABILITY IN WATER: Complete

EXPOSURE GUIDELINES: N/A

BOILING POINT: >100 deg C

PH: 3.5+/- 0.5

VAPOR PRESSURE: N/A

VAPOR DENSITY: N/A

SPECIFIC GRAVITY: 1.25

POUNDS PER GALLON: 10.45

PHYSICAL STATE: Liquid

OTHER PROPERTIES: N/A

MELTING POINT: >0 deg C

10. STABILITY AND REACTIVITY

STABLE: Stable

CONDITIONS TO AVOID:

None

INCOMPATIBILITY:

Strong Basic (Alkaline) Materials

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:

None known

HAZARDOUS POLYMERIZATION: Will Not Occur

CONDITIONS TO AVOID: None

11. TOXICOLOGICAL INFORMATION

N/A

12. ECOLOGICAL INFORMATION

N/A

13. DISPOSAL CONSIDERATIONS

Dilute with large amounts of water, neutralize with dilute base, and dispose to municipal or industrial waste treatment facility in accordance with applicable regulations.

14. TRANSPORT INFORMATION

DOT CLASS: Non-Regulated Material, Liquid

HAZARD CLASS: N/A

UN NUMBER: N/A

PACKING GROUP: N/A

GUIDE NUMBER: N/A

PROPER SHIPPING NAME: Non-Regulated Material, Liquid

15. REGULATORY INFORMATION

No information available.

16. OTHER INFORMATION

HMIS INFORMATION:	HEALTH: 1	FLAMMABILITY: 0	REACTIVE: 0	PROTECTIVE: B
NFPA INFORMATION:	TOXICITY: 1	FIRE: 0	REACTIVITY: 0	SPECIAL: N

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MATERIAL SAFETY DATA SHEET

WT 512

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER: CTL Services Company
12929 SE Division
Portland, OR 97236

INFORMATION PHONE: (503) 722-2272

**For Medical and Chemical Emergencies
call INFOTRAC at:**

PRODUCT NAME: WT 512

MSDS NUMBER: MSDS-00665

DATE PREPARED: 10/31/00

LAST REVISION: 10/31/00

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS #	OSHA PEL	ACGIH TLV	Weight %
Anionic water-soluble polymer				1

3. HAZARDOUS IDENTIFICATION

EMERGENCY OVERVIEW: N/A

POTENTIAL HEALTH EFFECTS

EYE CONTACT: May cause irritation

INHALATION: No hazard in normal industrial use.

INGESTION: No hazard in normal industrial use.

SKIN CONTACT: No hazard in normal industrial use.

SIGNS AND SYMPTOMS OF EXPOSURE: N/A

4. FIRST AID MEASURES

EYE CONTACT: Immediately flush eyes with water for at least 15 minutes. Hold eyelids open while flushing the eyes. Get medical attention.

INHALATION: Remove to fresh air.

INGESTION: No specific treatment is necessary since this material is not likely to be hazardous by ingestion.

SKIN CONTACT: Wash with soap and water. Change contaminated clothing. Get medical attention if irritation develops or persists.

AGGRAVATED MEDICAL CONDITIONS: N/A

SUPPLEMENTAL HEALTH INFORMATION:

N/A

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT: N/A

FLASH POINT METHOD USED: N/A

AUTOIGNITION: N/A

LEL:

UEL:

EXTINGUISHING MEDIA:

All standard firefighting media.

SPECIAL FIRE FIGHTING PROCEDURES:

Water produce extremely slippery surfaces.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

None known.

COMBUSTION PRODUCTS:

N/A

6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS SPILLED OR RELEASED:

DO NOT FLUSH WITH WATER. Clean up promptly by scoop or vacuum. Keep suitable and closed containers for disposal.

7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Avoid contact with skin and eyes. Avoid dust formation. Do not breathe dust. Wash hands after use. Keep in a cool, dry place.

OTHER PRECAUTIONS:

For industrial use only. Keep away from children. Keep containers closed while not in use.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION: Dust safety masks are recommended where concentration of total dust is more than 10 mg/m³

PROTECTIVE GLOVES: Rubber or other impervious material with gauntlets.

VENTILATION: Local exhaust sufficient to keep exposure below TLV.

WORK / HYGENIC PRACTICES: Use good personal hygiene when handling this product. Wash hands after use, before smoking, or using the toilet.

ENGINEERING CONTROLS: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

EYE PROTECTION: Safety glasses with side shields (or goggles). Do not wear contact lenses.

OTHER PROTECTIVE EQUIP: N/A

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: White, granular solid.

SOLUBILITY IN WATER: Incomplete

EXPOSURE GUIDELINES: N/A

BOILING POINT: N/A

PH: 4-9

VAPOR PRESSURE: N/A

VAPOR DENSITY: N/A

SPECIFIC GRAVITY: N/A

POUNDS PER GALLON: N/A

PHYSICAL STATE: solid

OTHER PROPERTIES: N/A

MELTING POINT: N/A

10. STABILITY AND REACTIVITY

STABLE: Stable

CONDITIONS TO AVOID:

None known.

INCOMPATIBILITY:

Strong oxidizing compounds

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:

Thermal decomposition may produce nitrogen oxides and/or carbon oxides.

HAZARDOUS POLYMERIZATION: Will Not Occur

CONDITIONS TO AVOID: None

11. TOXICOLOGICAL INFORMATION

N/A

12. ECOLOGICAL INFORMATION

Fish: LC50/Fathead minnows/96h>1000mg/L Algae: EC50/Selenatrum capricornutum/96h>500mg/L

13. DISPOSAL CONSIDERATIONS

Do not contaminate water. Consult appropriate Federal, State, or Local regulatory agencies to ascertain proper disposal procedures.

14. TRANSPORT INFORMATION

DOT CLASS: Non-Regulated Material, Liquid

HAZARD CLASS: N/A

UN NUMBER: N/A

PACKING GROUP: N/A

GUIDE NUMBER: N/A

PROPER SHIPPING NAME: Non-Regulated Material, Liquid

15. REGULATORY INFORMATION

Not a hazardous waste.

16. OTHER INFORMATION

HMIS INFORMATION:	HEALTH: 1	FLAMMABILITY: 1	REACTIVE: 0	PROTECTIVE: B
NFPA INFORMATION:	TOXICITY: 1	FIRE: 1	REACTIVITY: 0	SPECIAL: N

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MATERIAL SAFETY DATA SHEET

Product Name: 76 Food Machinery Oil 32
 Product Code: 4450032000

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1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: 76 Food Machinery Oil 32
 Product Code: 4450032000
 Generic Name: Industrial oil
 Chemical Family: Petroleum Hydrocarbon
 Responsible Party: 76 Lubricants Company
 A Division of TOSCO Corporation
 P.O. Box 25376
 Santa Ana, CA 92799-5376

Help Desk: 8am - 4pm Pacific Time, Mon-Fri: 1-800-762-0942

EMERGENCY OVERVIEW

24 Hour Emergency Telephone Numbers:

Spill, Leak, Fire or Accident	California Poison
Call CHEMTREC	Control System
North America: (800)424-9300	Cont. US: (800)356-3129
Others: (703)527-3887 (collect)	Outside US: (415)821-5338

Health Hazards: Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Physical Hazards: Keep away from all sources of ignition.

- ▶ Physical Form: Liquid
- ▶ Appearance: Water white oily
- ▶ Odor: Characteristic petroleum

NFPA HAZARD CLASS: Health: 1 (Slight)
 Flammability: 1 (Slight)
 Reactivity: 0 (Least)

2. COMPOSITION/INFORMATION ON INGREDIENTS

No hazardous components identified per 29 CFR 1910.1200.

OTHER COMPONENTS	% Weight	EXPOSURE GUIDELINE		
		Limits	Agency	Type

Issue Date: 09/13/99

Status: Final Revised

Revised Sections: 1, 2, 8

Hydraulic Oil 32 0-100 (See: Oil Mist, If Generated)
CAS# Proprietary

White Mineral Oil 0-98 (See: Oil Mist, If Generated)
CAS# 8042-47-5

Additives 0-2 Not Established
CAS# Proprietary

REFERENCEEXPOSURE GUIDELINE

	<u>Limits</u>	<u>Agency</u>	<u>Type</u>
Oil Mist, If Generated	5 mg/m3	ACGIH	TWA
CAS# None	10 ppm	ACGIH	STEL
	5 mg/m3	OSHA	TWA

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

3. HAZARDS IDENTIFICATION**POTENTIAL HEALTH EFFECTS:**

Eye: Contact may cause mild eye irritation including stinging, watering, and redness.

Skin: Contact may cause mild skin irritation including redness, burning sensation, and drying and cracking of the skin. No harmful effects from skin absorption have been reported.

Inhalation (Breathing): No information available. Studies by other exposure routes suggest a low degree of toxicity by inhalation.

Ingestion (Swallowing): No harmful effects reported from ingestion.

Signs and Symptoms: Effects of overexposure may include irritation of the nose and throat, irritation of the digestive tract, nausea and diarrhea.

Cancer: Inadequate data available to evaluate the cancer hazard of this material.

Target Organs: No data available for this material. See Section

11 for target-organ toxicity information of individual components, if any.

Developmental: No data available for this material. See Section 11 for developmental toxicity information of individual components, if any.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin disorders.

4. FIRST AID MEASURES

Eye: If irritation or redness develops, move victim away from exposure and into fresh air. Flush eyes with clean water. If symptoms persist, seek medical attention.

Skin: Wipe material from skin and remove contaminated shoes and clothing. Cleanse affected area(s) thoroughly by washing with mild soap and water and, if necessary, a waterless skin cleanser. If irritation or redness develops and persists, seek medical attention.

Inhalation (Breathing): If respiratory symptoms develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

Ingestion (Swallowing): First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

Note To Physicians: High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. Often these injuries require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury.

5. FIRE FIGHTING MEASURES

Flammable Properties: Flash Point: 334°F/168°C (COC)

Issue Date: 09/13/99

Status: Final Revised

Revised Sections: 1, 2, 8

OSHA Flammability Class: Not applicable
LEL/UEL%: No Data
Autoignition Temperature: No Data

Unusual Fire & Explosion Hazards: This material may burn, but will not ignite readily. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

Extinguishing Media: Dry chemical, carbon dioxide, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Fire Fighting Instructions: For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces, or when explicitly required by DOT, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area, keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk.

Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done with minimal risk. Avoid spreading burning liquid with water used for cooling purposes.

6. ACCIDENTAL RELEASE MEASURES

This material may burn, but will not ignite readily. Keep all sources of ignition away from spill/release. Stay upwind and away from spill/release. Notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment including respiratory protection as conditions warrant (see Section 8).

Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Dike far ahead of spill for later recovery or disposal. Spilled material may

be absorbed into an appropriate absorbent material.

Notify fire authorities and appropriate federal, state, and local agencies. Immediate cleanup of any spill is recommended. If spill of any amount is made into or upon navigable waters, the contiguous zone, or adjoining shorelines, notify the National Response Center (phone number 800-424-8802).

7. HANDLING AND STORAGE

Handling: Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Sections 2 and 8).

Do not wear contaminated clothing or shoes. Use good personal hygiene practice.

High pressure injection of hydrocarbon fuels, hydraulic oils or greases under the skin may have serious consequences even though no symptoms or injury may be apparent. This can happen accidentally when using high pressure equipment such as high pressure grease guns, fuel injection apparatus or from pinhole leaks in tubing of high pressure hydraulic oil equipment.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1 and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

Storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas away from heat and all sources of ignition. Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Section 2), additional ventilation or exhaust systems may be required.

Personal Protective Equipment (PPE):

Respiratory: A NIOSH certified air purifying respirator with a Type 95 (R or P) particulate filter may be used under conditions where airborne concentrations are expected to exceed exposure limits (see Section 2).

Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a positive pressure air supplied respirator if there is potential for uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.

Skin: The use of gloves impervious to the specific material handled is advised to prevent skin contact and possible irritation (see manufacturers literature for information on permeability).

Eye/Face: Approved eye protection to safeguard against potential eye contact, irritation, or injury is recommended. Depending on conditions of use, a face shield may be necessary.

Other Protective Equipment: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Flash Point: 334°F / 168°C (COC)

Flammable/Explosive Limits (%): No Data

Autoignition Temperature: No Data

Issue Date: 09/13/99

Status: Final Revised

Revised Sections: 1, 2, 8

Appearance: Water white oily
Physical State: Liquid
Odor: Characteristic petroleum
pH: Not applicable
Vapor Pressure (mm Hg): No Data
Vapor Density (air=1): >1
Boiling Point/Range: >536°F / >280°C
Freezing/Melting Point: No Data
Solubility in Water: Negligible
Specific Gravity: 0.87
Percent Volatile: Negligible
Evaporation Rate (nBuAc=1): <1
Viscosity: 32 cSt @ 40°C
Bulk Density: 7.25 lbs/gal

10. STABILITY AND REACTIVITY

Chemical Stability: Stable under normal conditions of storage and handling.

Conditions To Avoid: Extended exposure to high temperatures can cause decomposition.

Incompatible Materials: Avoid contact with strong oxidizing agents.

Hazardous Decomposition Products: Combustion can yield carbon dioxide and carbon monoxide.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

No definitive information available on carcinogenicity, mutagenicity, target organs or developmental toxicity.

12. DISPOSAL CONSIDERATIONS

This material under most intended uses would become used oil due to contamination by physical or chemical impurities. RECYCLE ALL USED OIL. While being recycled, used oil is regulated by 40 CFR 279. Use resulting in chemical or physical change or contamination may also subject it to regulation as hazardous waste. Under federal regulations, used oil is a solid waste managed under 40 CFR 279.

Product Name: 76 Food Machinery Oil 32
Product Code: 4450032000

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However, in California, used oil is managed as hazardous waste until tested to show it is not hazardous. Consult state and local regulations regarding the proper handling of used oil. In the case of used oil, the intent to discard it may cause the used oil to be regulated as hazardous waste.

Contents should be completely used and containers emptied prior to discard. Rinsate may be considered a RCRA hazardous waste and must be disposed of with care and in compliance with federal, state and local regulations. Large empty containers, such as drums, should be returned to the distributor or a drum reconditioner. To assure proper disposal of small empty containers, consult with state and local regulations and disposal authorities.

13. TRANSPORT INFORMATION

Hazard Class or Division: Not classified as hazardous

14. REGULATORY INFORMATION

This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:

--None--

Warning: This material contains the following chemicals which are known to the State of California to cause cancer, birth defects or other reproductive harm, and are subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

--None Known--

This material has not been identified as a carcinogen by NTP, IARC, or OSHA.

EPA (CERCLA) Reportable Quantity: --None--

15. DOCUMENTARY INFORMATION

Issue Date: 09/13/99
Previous Issue Date: 01/26/99
Product Code: 4450032000
Previous Product Code: 4450032000

Issue Date: 09/13/99
Revised Sections: 1, 2, 8

Status: Final Revised

Product Name: 76 Food Machinery Oil 32
Product Code: 4450032000

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16. DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

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Issue Date: 09/13/99
Revised Sections: 1, 2, 8

Status: Final Revised

MATERIAL SAFETY DATA SHEET

Product Name: 76 MP Gear Lube 80W-90
Product Code: 5163080900

Page 1 of 9

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: 76 MP Gear Lube 80W-90
Product Code: 5163080900
Generic Name: Gear lubricant
Chemical Family: Petroleum Hydrocarbon
Responsible Party: 76 Lubricants Company
A Division of TOSCO Corporation
P.O. Box 25376
Santa Ana, CA 92799-5376

Help Desk: 8am - 4pm Pacific Time, Mon-Fri: 1-800-762-0942

EMERGENCY OVERVIEW

24 Hour Emergency Telephone Numbers:

Spill, Leak, Fire or Accident California Poison
Call CHEMTREC Control System
North America: (800)424-9300 Cont. US: (800)356-3129
Others: (703)527-3887 (collect) Outside US: (415)821-5338

Health Hazards: Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Physical Hazards: Keep away from all sources of ignition.

- ▶ Physical Form: Liquid
- ▶ Appearance: Clear brown
- ▶ Odor: Characteristic Petroleum

NFPA HAZARD CLASS: Health: 1 (Slight)
Flammability: 1 (Slight)
Reactivity: 0 (Least)

2. COMPOSITION/INFORMATION ON INGREDIENTS

No hazardous components identified per 29 CFR 1910.1200.

OTHER COMPONENTS	% Volume	EXPOSURE GUIDELINE		
		Limits	Agency	Type

Issue Date: 12/29/99

Status: Final Revised

Revised Sections: 1, 2, 3, 9, 10

Product Name: 76 MP Gear Lube 80W-90
Product Code: 5163080900

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Lubricant Base Oil 87-97 (See: Oil Mist, If Generated)
(Petroleum)
CAS# Various

Additives 3-13 Not Established
CAS# Proprietary

REFERENCE

EXPOSURE GUIDELINE

	<u>Limits</u>	<u>Agency</u>	<u>Type</u>
Oil Mist, If Generated	5 mg/m3	ACGIH	TWA
CAS# None	10 mg/m3	ACGIH	STEL
	5 mg/m3	OSHA	TWA
	2500 mg/m3	NIOSH	IDLH

The base oil for this product can be a mixture of any of the following highly refined petroleum streams: CAS 64741-88-4; CAS 64741-89-5; CAS 64741-96-4; CAS 64741-97-5; CAS 64742-01-4; CAS 64742-52-5; CAS 64742-53-6; CAS 64742-54-7; CAS 64742-55-8; CAS 64742-56-9; CAS 64742-57-0; CAS 64742-62-7; CAS 64742-63-8; CAS 64742-65-0; CAS 72623-85-9; CAS 72623-86-0; CAS 72623-87-1

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

3. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS:

Eye: Contact may cause mild eye irritation including stinging, watering, and redness.

Skin: Contact may cause mild skin irritation including redness, and a burning sensation. Prolonged or repeated contact can worsen irritation by causing drying and cracking of the skin leading to dermatitis (inflammation). No harmful effects from skin absorption are expected.

Inhalation (Breathing): No information available. Studies by other exposure routes suggest a low degree of toxicity by inhalation.

Ingestion (Swallowing): No harmful effects expected from ingestion.

Issue Date: 12/29/99

Status: Final Revised

Revised Sections: 1, 2, 3, 9, 10

Signs and Symptoms: Effects of overexposure may include irritation of the nose and throat, irritation of the digestive tract, nausea and diarrhea.

Cancer: Inadequate evidence available to evaluate the cancer hazard of this material. See Section 11 for carcinogenicity information of individual components, if any.

Target Organs: No data available for this material. See Section 11 for target-organ toxicity information of individual components, if any.

Developmental: No data available for this material. See Section 11 for developmental toxicity information of individual components, if any.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin disorders.

4. FIRST AID MEASURES

Eye: If irritation or redness develops, move victim away from exposure and into fresh air. Flush eyes with clean water. If symptoms persist, seek medical attention.

Skin: Wipe material from skin and remove contaminated shoes and clothing. Cleanse affected area(s) thoroughly by washing with mild soap and water and, if necessary, a waterless skin cleanser. If irritation or redness develops and persists, seek medical attention.

Inhalation (Breathing): If respiratory symptoms develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

Ingestion (Swallowing): First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

Note To Physicians: High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. Often these injuries require extensive emergency surgical debridement and all

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injuries should be evaluated by a specialist in order to assess the extent of injury.

5. FIRE FIGHTING MEASURES

Flammable Properties: Flash Point: 352°F/178°C (COC)
OSHA Flammability Class: Not applicable
LEL/UEL%: No Data
Autoignition Temperature: No Data

Unusual Fire & Explosion Hazards: This material may burn, but will not ignite readily. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

Extinguishing Media: Dry chemical, carbon dioxide, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Fire Fighting Instructions: For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces, or when explicitly required by DOT, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area, keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk.

Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done with minimal risk. Avoid spreading burning liquid with water used for cooling purposes.

6. ACCIDENTAL RELEASE MEASURES

This material may burn, but will not ignite readily. Keep all sources of ignition away from spill/release. Stay upwind and away

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from spill/release. Notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment including respiratory protection as conditions warrant (see Section 8).

Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Dike far ahead of spill for later recovery or disposal. Spilled material may be absorbed into an appropriate absorbent material.

Notify fire authorities and appropriate federal, state, and local agencies. Immediate cleanup of any spill is recommended. If spill of any amount is made into or upon navigable waters, the contiguous zone, or adjoining shorelines, notify the National Response Center (phone number 800-424-8802).

7. HANDLING AND STORAGE

Handling: Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Sections 2 and 8).

Do not wear contaminated clothing or shoes. Use good personal hygiene practice.

High pressure injection of hydrocarbon fuels, hydraulic oils or greases under the skin may have serious consequences even though no symptoms or injury may be apparent. This can happen accidentally when using high pressure equipment such as high pressure grease guns, fuel injection apparatus or from pinhole leaks in tubing of high pressure hydraulic oil equipment.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1 and other

references pertaining to cleaning, repairing, welding, or other contemplated operations.

Storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas away from heat and all sources of ignition. Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

B. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Section 2), additional ventilation or exhaust systems may be required.

Personal Protective Equipment (PPE):

Respiratory: A NIOSH certified air purifying respirator with a Type 95 (R or P) particulate filter may be used under conditions where airborne concentrations are expected to exceed exposure limits (see Section 2).

Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a positive pressure air supplied respirator if there is potential for uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.

Skin: The use of gloves impervious to the specific material handled is advised to prevent skin contact and possible irritation (see manufacturers literature for information on permeability).

Eye/Face: Approved eye protection to safeguard against potential eye contact, irritation, or injury is recommended. Depending on conditions of use, a face shield may be necessary.

Other Protective Equipment: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

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9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Flash Point: 352°F / 178°C (COC)
Flammable/Explosive Limits (%): No Data
Autoignition Temperature: No Data
Appearance: Clear brown
Physical State: Liquid
Odor: Characteristic Petroleum
pH: Not applicable
Vapor Pressure (mm Hg): <1
Vapor Density (air=1): >1
Boiling Point/Range: >555°F / >291°C
Freezing/Melting Point: No Data
Solubility in Water: Negligible
Specific Gravity: 0.88-0.90
Percent Volatile: Negligible
Evaporation Rate (nBuAc=1): <1
Viscosity: 13.8-14.3 cSt @ 100°C
Bulk Density: 7.46 lbs/gal

10. STABILITY AND REACTIVITY

Chemical Stability: Stable under normal conditions of storage and handling.

Conditions To Avoid: Extended exposure to high temperatures can cause decomposition.

Incompatible Materials: Avoid contact with strong oxidizing agents.

Hazardous Decomposition Products: Combustion can yield carbon, nitrogen and sulfur oxides. Hydrogen sulfide and alkyl mercaptans may also be released.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Lubricant Base Oil (Petroleum) (CAS# Various)

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Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including solvent extraction, hydrotreating, and dewaxing to remove aromatics and improve performance characteristics. None of the oils used are listed as a carcinogen by NTP, IARC, or OSHA.

12. DISPOSAL CONSIDERATIONS

This material under most intended uses would become used oil due to contamination by physical or chemical impurities. RECYCLE ALL USED OIL. While being recycled, used oil is regulated by 40 CFR 279. Use resulting in chemical or physical change or contamination may also subject it to regulation as hazardous waste. Under federal regulations, used oil is a solid waste managed under 40 CFR 279. However, in California, used oil is managed as hazardous waste until tested to show it is not hazardous. Consult state and local regulations regarding the proper handling of used oil. In the case of used oil, the intent to discard it may cause the used oil to be regulated as hazardous waste.

Contents should be completely used and containers emptied prior to discard. Rinsate may be considered a RCRA hazardous waste and must be disposed of with care and in compliance with federal, state and local regulations. Large empty containers, such as drums, should be returned to the distributor or a drum reconditioner. To assure proper disposal of small empty containers, consult with state and local regulations and disposal authorities.

13. TRANSPORT INFORMATION

Hazard Class or Division: Not classified as hazardous

14. REGULATORY INFORMATION

This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:

--None--

Warning: This material contains the following chemicals which are known to the State of California to cause cancer, birth defects or other reproductive harm, and are subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

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--None Known--

This material has not been identified as a carcinogen by NTP, IARC, or OSHA. See Section 11 for carcinogenicity information of individual components, if any.

EPA (CERCLA) Reportable Quantity: --None--

15. DOCUMENTARY INFORMATION

Issue Date: 12/29/99
Previous Issue Date: 06/25/99
Product Code: 5163080900
Previous Product Code: 5163080900

16. DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

The information presented in this Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

Issue Date: 12/29/99
Revised Sections: 1, 2, 3, 9, 10

Status: Final Revised

APPENDIX L
BYPASS CONTACT LIST

IF A SPILL OCCURS AT THE TREATING PLANT

1. Take immediate action to stop the spill.
2. Implement SPCC and ERP plans to keep the spill from reaching the river.
3. Call the emergency coordinator or his alternate:

Jerry Lauer	Home	1-503-843-3671		
	Office	1-503-843-2122	Direct	1-503-843-7040
	Mobile	1-503-434-2151	Pager	1-503-435-4346
Ken Saunders	Home	1-503-843-2012	Cell	1-503-435-8976
	Office	1-503-843-2122	Pager	1-503-435-4347

4. Call the treating plant manager:

Roland Mueller	Home	1-503-378-0444		
	Office	1-503-843-2122	Direct	1-503-843-7034
	Mobile	1-503-435-7929	Pager	1-503-435-4342

5. Call your supervisor:

Greg Hays	Office	1-503-843-2122	Direct	1-503-843-7039
Don Mellgren	Office	1-503-843-2122	Direct	1-503-843-7038

6. Emergency Coordinator will call the following as needed:

Oregon Emergency Services	1-800-452-0311
USEPA National Response Center	1-800-424-8802
Oregon DEQ	1-503-229-5263
Sheridan Fire Department	1-503-843-2467
Sheridan Sheriff Substation	1-503-843-2431
McMinnville Community Hospital	1-503-472-6131
Maul Foster & Alongi	1-800-896-4405
Potential Cleanup Contractors:	
Northwest Field Services	1-503-241-3827
Spencer Environmental Services	1-800-733-0896
or	1-503-655-0896
SUMCO Excavating	1-503-843-3234
Hazardous Waste Transportation:	
Onyx.	1-503-682-2341

IF A BYPASS OCCURS AT THE STORMWATER PLANT

The treating plant manager, his designated representative, or legal counsel will call the following as needed:

Oregon Emergency Services	1-800-452-0311
USEPA National Response Center	1-800-424-8802
Oregon DEQ	1-503-229-5263
City of Sheridan Department of Public Works	1-503-843-2347
Oregon State Health Division Drinking Water Program	1-503-731-4899
Sun Newspaper	1-503-843-2312

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I 2008 Annual Asphalt Cap Inspection Report

August 11, 2009

Karen Keeley
Remedial Project Manager
U.S. Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101

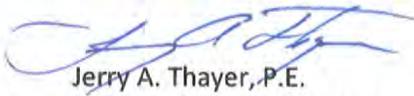
Re: Wilder Construction Company name change

Ms. Keeley,

Effective April 1, 2009, all of our operations merged into one operation as Granite Construction Company, a wholly owned subsidiary of Granite Construction Incorporated. All correspondence should be addressed to my attention, Granite Construction Company, 1525 East Marine View Drive, Everett, WA 98201.

Sincerely,

GRANITE CONSTRUCTION COMPANY



Jerry A. Thayer, P.E.

MatCon Program Manager

Wilder Construction Company

MatCon Annual Inspection Report

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Project: Taylor Lumber and Treating Superfund Site

Number: _____

Location: Sheridan, Oregon

Date Constructed: July 2007

Name of Inspector (s): Ron Terrel

Position: MatCon Consultant

Jerry Thayer

MatCon Program Manager

Date of Inspection: 11 August 2008; Time: Start 8:00 am; Stop 11:00 am

Refer to attached site map for approximate locations

<u>Section No.</u>	<u>Site Use</u>	<u>Observed Distress¹</u>
	Describe Current use of each section. Note any changes since last report	0. None 1. Alligator Cracking 2. Block or Thermal Cracking 3. Depression or Settlement 4. Standing Water 5. Rutting 6. Raveling / Weathering / Surface Blemish 7. Hydrocarbon or Chemical Spill For each section indicate: <ul style="list-style-type: none"> ☐ Type of distress ☐ Locate distress on site map ☐ Provide GPS coordinates ☐ Attach Photo if appropriate ☐ Provide additional description / dimension
Overall Site	Preservative Treatment of Wood Products	GPS Location: Long.: Not used__ Lat.: _____ Alt.: _____ Observed Distress: See notes following _____ Dimension: Length: N.A. _____ Width: _____ Depth: _____ Notes: See notes on following pages.

¹ Refer to MatCon Operation and Maintenance Plan (OMP), Revision 3, for Impermeable MatCon Modified Asphalt Cap, at Taylor Lumber Superfund Site, Wilder Construction Company, March 3, 2008 for information on distress.

		GPS Location: Long. _____ Lat. _____ Alt. _____ Observed Distress: _____ Dimension: Length _____ Width _____ Depth: _____ Notes:
Summary of Results: <input type="checkbox"/> Overall satisfactory condition <input checked="" type="checkbox"/> Needs attention as noted Action Taken: <input type="checkbox"/> None Required <input type="checkbox"/> Corrective action implemented <input type="checkbox"/> Contacted Wilder Construction Co. <input type="checkbox"/> Report forwarded to Wilder Construction <input checked="" type="checkbox"/> Result of action attached		
Inspector Name: <u>Ronald L. Terrel</u> Signature: <u>/s/</u> Date: <u>21 Aug. 2008</u>		

**Taylor Lumber and Treating Superfund Site
Annual Inspection of MatCon Cap
August 11, 2008**

Notes

The inspection was conducted during a walk-around by Dr. Ronald Terrel and Mr. Jerry Thayer as part of the MatCon Operation and Maintenance Plan (OMP; March 3, 2008) and MatCon Material Workmanship and Warranty (May 29, 2008) process. Following this inspection, the inspectors were then accompanied by Ms. Karen Keeley (EPA), and Mr. Dan Peterson (CH2M Hill), for additional discussion of the site conditions. Mr. Sheldon Stewart, the plant manager for Pacific Wood Preserving of Oregon, was also present on occasion.

The vast majority of the site is performing very well and is in excellent condition. Several areas of concern are discussed below, as part of this inspection, and in response to concerns expressed earlier by EPA (2008²). The specific topics of concern will be addressed in the following notes. Figure 1, site map, has been marked to show locations of concern. No other areas of distress in the asphalt were identified, and no other areas of separation or cracking were identified in areas of contact between the MatCon cap and concrete or other non-MatCon material.

Note 1. Small cracks associated with “blisters” in Area A. See Photographs 3, 4, and 5.

Note 2. Quasi-cracks between MatCon and existing concrete in Area B. See Photographs 9 and 10.

Note 3. Indents from vehicles and dunnage under stacks of lumber in Area C. See Photographs 11, 12 and 13.

Note 4. Following construction, there was concern that there may be edge break-off of MatCon in Area D, but none was observed

Note 5. Edge cracks at structures and foundations. None observed.

Note 6. Indents from large aggregate particles being pressed into surface were noted in Area E. This is a maintenance issue, and will be addressed by sweeping and keeping the area clean See Photographs 14 and 15.

Note 7. Oil spills. Small drip spots not of concern. One location, Area F had spilled hydraulic fluid, but it was a one-time occurrence, and it is ok after clean-up was done. See Photographs 16 and 17.

Note 8. Although not a distress, there was some concern about sealing the joint between a new concrete slab (condenser) placed on the MatCon. It is not recommended to use any sealer since that might trap moisture between the concrete and MatCon.

Note 9. Questions about how to seal the joint between the MatCon (sawed face) and concrete to be placed for the new trench drains. This was not part of the annual inspection, so will be addressed separately.

² EPA. Summary of MatCon Asphalt Work to be Performed on August 11, 2008. Technical Memorandum prepared by Karen Keeley, EPA Region 10, Seattle, WA, dated August 10, 2008.

The topics of Notes 1 – 3 will be discussed in some detail in the following pages.

Note 1 - Blistering

In Area A, shown on Figure 1, reports of “blistering” of the MatCon surface were reported by Mr. Sheldon Stewart on July 14, 2008 (EPA 2008). They ranged from 8 inches to 18 inches in diameter, and had cracks in the top. On 11 August 2008, during the annual inspection, the cracks were visible, but the blisters had been flattened by traffic. Figure 2 shows the area where these cracks were found, with measurements to show the location for future reference. Photographs 3 to 8 indicate more detail.

In order to assess the cause of blistering and cracking, a block of MatCon was dry-sawed and removed in the location shown on Figure 2 (Photograph 7). The cracks did not appear to go all the way through the 4 inches of MatCon, but they may have been partially healed by traffic. The sawed block was not bonded, and lifted cleanly from the hole. Underneath, the tack coat was fully in place, black and shiny, although the MatCon was not fully bonded to the existing pavement. There was also a thin film of water on the surface of the underlying asphalt pavement (at this location, the MatCon overlaid an existing asphalt pavement). Following observation and discussion, the block was replaced in the hole, and was sealed with hot mastic later (on October 6, 2008).

The reason for blistering is speculated that moisture had entered the interface between the old asphalt layer and the MatCon overlay. Possible causes and sources of the water were discussed which included groundwater or seepage and wicking from a side source. The nearby sump could be a possible source. This sump appears to not be watertight along the interface with the existing pavement. Water could enter this interface and accumulate in the v-shaped trough of the old pavement surface. It was agreed by Wilder that the rim of the sump will be cleaned and sealant will be placed along the perimeter to prevent any water from migrating through the asphalt layer below the MatCon overlay. It is assumed that when the MatCon surface was heated by warm weather, the moisture vapor built pressure and lifted the MatCon into a blister. When the MatCon cracked (from the surface downward), the pressure was released, and the blister was flattened, as was observed on August 11.

There were three blisters that had cracked, and two other small areas that had been marked, but did not show any cracking. Two other areas of small cracks were noted further west as shown in Figure 2.

Baker Rock rolled the area using a pneumatic tired roller, and some additional flattening was observed, however did not completely flatten the blistered areas. The plan is to watch for further blistering, and if it occurs, the cracks will be sealed with liquid asphalt sealer (to be provided by Wilder, and re-rolled by a subcontractor to Wilder). The existing cracks were routed using the asphalt saw, and were sealed using hot asphalt mastic hot asphalt mastic at the time the new trench drains were sealed (October 6, 2008).

Follow-up, 6 October 2008

On October 6, 2008, Mr. Jerry Thayer was on site to oversee the sealing of the cracks caused by blistering and to replace the sawed block removed in Area A which had been used to evaluate the cause of blistering. Photograph 19 shows the filling of the sawed joints using hot mastic. This method was used on all the sawed cracks observed in Area A as noted above. Work was performed by Roger Langeliers Construction Company (Kenny Wood, 503-849-4813, Kenny@rlcgroup.com), a subcontractor to Wilder. The crack sealant used was Crafcro Parking Lot Sealant 34200, applied using a Crafcro EZ-1000 Melter/Applicator.

On October 6, Mr. Thayer discussed the sump repairs with Mr. Sheldon Stewart and the supervisor from Roger Langeliers. The original thought was that a frame made up of wood be fitted to the sump perimeter, and the void filled with hot mastic to provide a more positive seal. However, after discussion it was decided that this was impractical and might not support the heavy lid and may be prone to failure with potential debris falling into the sump. The Roger Langeliers supervisor recommended that the surface be cleaned and a bead of the hot-melt parking lot sealant be placed against the concrete-MatCon interface. Therefore, the edge inside the sump was cleaned and sealed with hot mastic as shown in Photograph 23. Should the blistering return next summer and the sump seal again be suspected as being the cause, Wilder recommends that a permanent metal frame be constructed leaving a void between the MatCon cap and the frame that could be filled with sealant. This is design issue and is not covered by the MatCon warranty.

Note 2 Joint Cracks

In Area B, it was observed that there was a slight separation between the MatCon and existing concrete pad around the steel rails, on the north and west sides only (Photograph 10). The south side appears to be in good shape. It was suggested that the separated joints be routed and filled with hot mastic crack sealer. The routing should result in a groove measuring about ½ inch to ¾ inch in cross section. Filling with sealer should be to the top, so it is flush with the surrounding surface. This sealing was proposed to be accomplished at the same time as other sealing is done at the site.

Follow-up on 6 October 2008

The joint between the north and west side of the concrete area was routed and sealed according to the recommendation above. Photograph 20 shows the routing and cleaning work underway and Photograph 21 is a view of the actual crack sealing operation. Photograph 22 is a close-up view of the hot mastic being applied.

Note 3 Indents

Area C is where there were indentations in the MatCon pavement caused by standing loads from vehicles, primarily fork lifts and stacked lumber (e.g., see Photograph 18). Following construction in 2007, the MatCon appeared to be somewhat soft in hot weather, and formed depressions under the heavy loads. Although this does not detract from the serviceability of the MatCon, which is intended to be pliable, the site operator expressed concern about safety when the fork lifts traversed the area, resulting in a rough ride. As part of the OMP (p. 13) and Warranty, Wilder agreed to re-roll the area during the hot summer weather one year later, in 2008. Accordingly, the rolling was done using a heavy pneumatic tired roller on August 11, and again on August 15 (Photograph 13). The area of pavement that was rolled was approximately 42' wide by 50' long and was rolled in a direction perpendicular the normal forklift traffic pattern in this area. The results of this work are shown on Figure 3. An area approximately 40' long by 30' wide adjacent to the dolly loading tracks on the east side of the shed was also rolled by Baker Rock (area G).

It should be noted that the entire area under question was much smoother in 2008 than it was in 2007. The number of depressions was reduced and they did not appear to be as deep. Overall, it appeared that normal operations on the site with many passes of wheeled carriers tended to smooth out the surface in general. The equipment operators and the site manager agreed that the change was noticeable.

Five depressed areas were selected for monitoring during the rolling process, as noted on Figure 3. Depressions 1, 2, 3, and 5 appeared to be caused by wheel loads, while depression 4 was from some narrow hard object that was most likely under a stack of lumber and pressed into the surface. The nature of these depressions can be seen in Photographs 11 and 12 where a straight edge was placed over the depression and the maximum depth was measured. As can be seen from Figure 3, on August 11, after 12 passes of the roller, the area was flattened to a point where the depressions were reduced by about 25-70% of the original. Following the additional rolling done on August 15, in hotter weather, the area was ironed out even more, with some of the selected depressions being negligible and difficult to measure. Even area 4 on Figure 3, a sharp depression, was reduced by more than 50%. If the depression caused by dunnage could not be rolled out, it was to be filled with sealant. Note that filling of this depression was inadvertently overlooked when sealing was underway on October 6, 2008.

According to the OMP, the objective of the rolling is two-fold. Based on observations, the rolling did show indications that the pavement was being rolled out, but not to the extent of leaving deeper ruts in the direction of rolling. The pavement was somewhat smoother, but depressions could still be measured, and although slight, were reduced. This indicates that the pavement is stiffening with time and the same procedure will be repeated in the following year until no movement is detected.

An observation that is often seen in pavements with very low air voids is that depressions or rutting occur by shoving the asphalt laterally rather than compressing it as the loads

caused decreasing air voids by compacting it. In cross section, the rut is higher at the sides than the surrounding area, and increases the vertical distance from the peaks of these raised sides, giving the impression that the rut is deeper than it really is. It was also noted that the rolling process tended to flatten the peaks rather than fill the depressions.

It is expected that the MatCon will continue to stiffen with time and any tendency to rut will diminish, as has been seen in the first year of service. Put in perspective, the MatCon is doing its job of maintaining an impervious membrane without cracking, and still allowing very aggressive use of the site. Of all MatCon projects, the Taylor Lumber site is receiving by far the most use, and is doing well. During the next annual inspection, the rutting situation will again be evaluated to see if additional rolling is warranted.

Other Work Required by the OMP/Warranty

The OMP (p. 2) required Wilder to “meet with the site operator to discuss the dunnage issue and will assist the site operator in finding alternatives to the current operations that will impose lower surface contact pressures while minimizing impact to the efficiencies of the current operating procedures.” Jerry Thayer contacted the plant manager for Pacific Wood Preserving of Oregon, Sheldon Stewart on December 5, 2008 and discussed the dunnage issue. Both agreed that the currently used dunnage was not causing depressions except in hot weather and that the MatCon cap was stiffening over time so that future depressions would likely be shallower. They also agreed that the depressions that had occurred were not damaging the integrity of the cap. They therefore decided to wait for the hot weather next summer to reassess whether changes to dunnage requirements would be needed at that time.

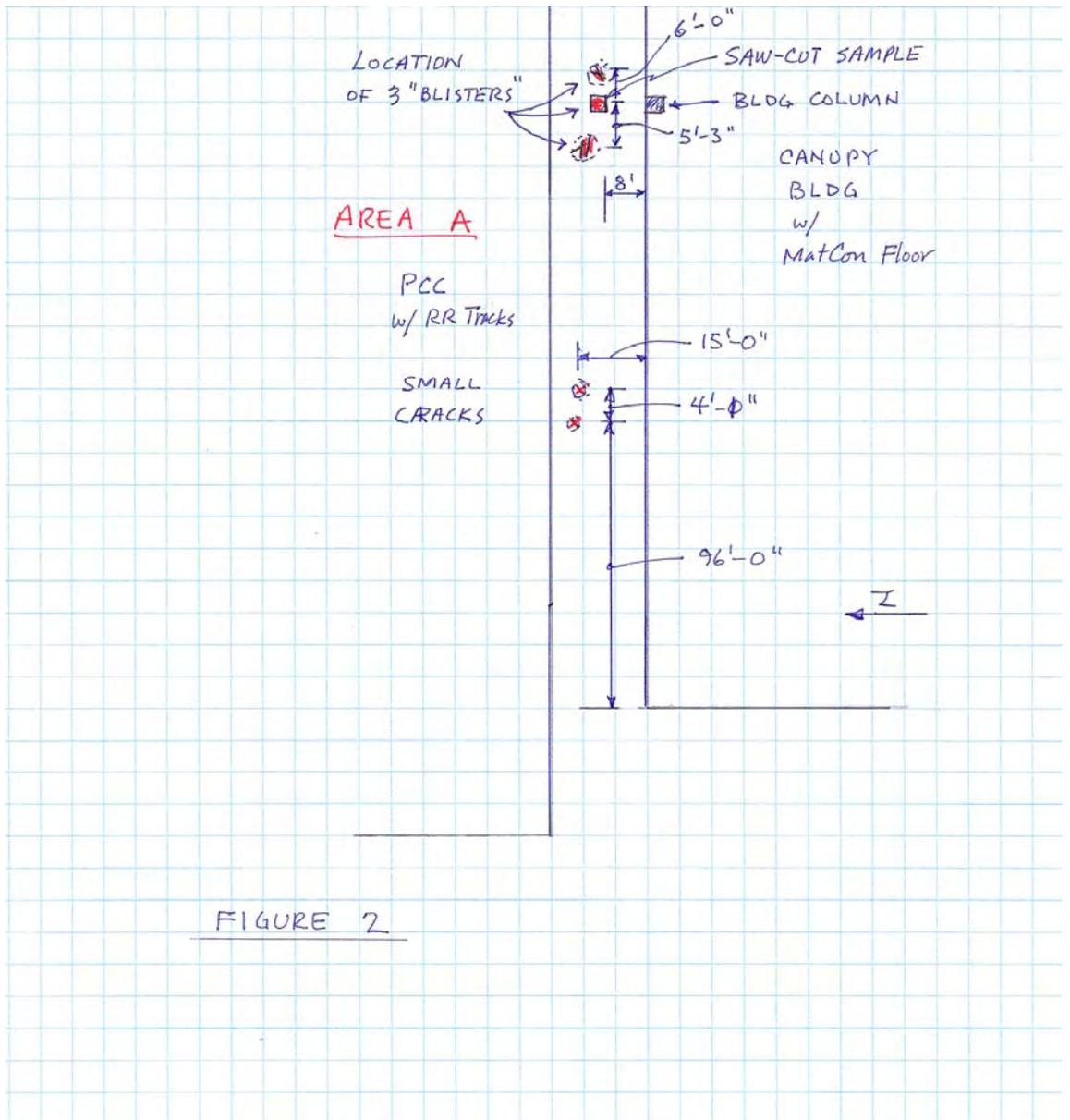
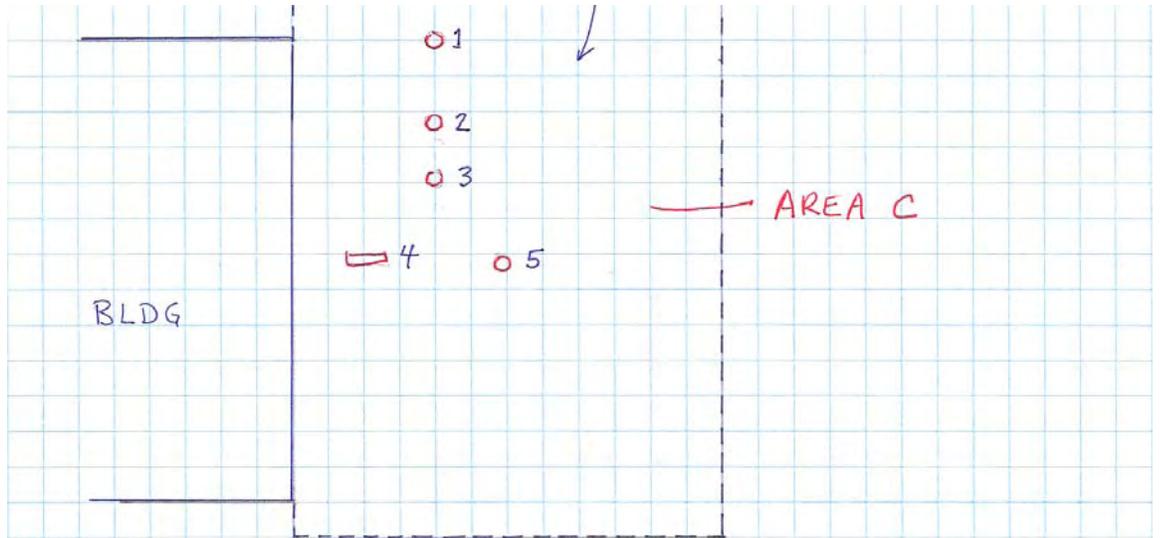


FIGURE 2



SITE #	ORIGINAL DERESSION	AFTER * 12 PASSES	AFTER ** 12 PASSES
1	3/8"	1/8"	1/16
2	1/8	3/32	1/32
3	7/32	1/16	1/16
4	17/32	3/8	~ 1/4
5	3/16	3/32	1/32

* Aug. 11, 2008 AIR TEMP 82°F at 2 pm
 ** Aug. 15, 2008 AIR TEMP 96°F at 4 pm

FIGURE 3



Photograph 1 Overall view looking North from near the office.



Photograph 2 Overall view looking West from near the office. Photographs 1 and 2 show the good condition of the MatCon after one year of service.



Photograph 3 is the remaining crack after traffic had compressed the blister discussed in Note 1



Photograph 4 is of the crack remaining after blistering and is the area that was sawed for evaluation of the underside of the MatCon...see Note 1.



Photograph 5 shows a lesser crack, similar to found in Area A which may have had minor blistering. These cracks will be monitored in future inspections.



Photograph 6 shows the saw cuts made to remove a sample of MatCon. Although the blistering reported by Mr. Stewart earlier was no longer evident, there was a slight (<1/2 in) settlement of the block, indicating a void underneath.



Photograph 7 shows the void after removing the block of MatCon. It was evident that the MatCon had separated from the underlying old asphalt pavement, and the black shiny surface was the tack coat. This tack coat was moist to the touch, and is very likely the source of water that created vapor pressure that, in turn, caused blistering.



Photograph 8 shows the rolling/recompacting operation using a heavy pneumatic roller in an attempt to smooth the blistered spots in Area A



Photograph 9 is the joint between the existing concrete pad and MatCon where it was agreed that the joint should be routed and sealed with asphalt mastic. Photographs 19-22 illustrate this follow-up work as described in Note 2



Photograph 10 is a close-up view of the concrete to MatCon interface.



Photograph 11 is representative of some depressions found in Area C that were recompactd using the pneumatic roller as described in Note 3



Photograph 12 is one indent that was apparently caused by a narrow piece of dunnage under a stack of lumber. The indent is about $\frac{1}{2}$ in deep, but does not have any cracking associated with it. It was intended that this indent be sealed on Oct. 6, 2008, but it was inadvertently overlooked.



Photograph 13 is Area C where the recompaction is underway (see pneumatic roller near the building) and the measurements in Figure 3 were taken in order to evaluate the effectiveness of the recompaction.



Photograph 14 is representative of some areas where loose gravel has migrated under traffic onto the MatCon surface (see Note 6)



Photograph 15 is a close-up showing the result of heavy vehicles rolling over loose gravel on top of the MatCon surface.



Photograph 16 is and oil spill that has marked the MatCon surface.



Photograph 17 is an area within the covered building south of Area A where vehicles are apparently parked, and it was noted that oil dripping are marking the MatCon and may eventually soften the MatCon binder.



Photograph 18 is typical of the usage of the site and the stacking of lumber on only two each 2”x4” pieces of dunnage or “stickers”.



Photograph 19 shows the sealing of the saw cuts shown in Photograph 7.



Photograph 20 shows routing of the joint between the concrete and MatCon described in Note 3 and Photographs 9 and 10



Photograph 21 shows the application of hot mastic as described in Note 2.



Photograph 22 is a close-up view of the hot mastic being applied in Photograph 21.



Photograph 23 shows the bead of hot mastic placed around the sump area.

J Operation and Maintenance Cost Estimates

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12/07/2006 12:32 PM To
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cc

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Subject
Taylor Lumber O&M costs

Alan - Per our conversation yesterday at the All-States meeting, the estimated O&M costs for the Taylor Lumber site are attached, including an identification of which costs are the responsibility of PWPO. Please note that these costs are +50/-30%, contingency allowances (25%) and project management and support (10%) costs are reported separately, and the amounts are present value.

DEQ responsibilities:

- Oversight of institutional controls.
- Oversight of PWPO's performance of groundwater extraction system

and

asphalt inspection/maintenance/repair.

- Performance of groundwater monitoring and reporting for

groundwater

outside the barrier wall.

PWPO responsibilities per the PPA:

- Performance of groundwater extraction, inspection and maintenance

of

extraction system (with reporting), and treatment of extracted water in onsite stormwater treatment system. Please note that the costs in the estimate does not include treatment of stormwater under RCRA, only treatment of groundwater for the remedy.

- Performance of asphalt inspection, reporting, maintenance and

repair

for the asphalt within the barrier wall area.

- PWPO has no responsibility for groundwater monitoring outside the

barrier wall.

If you have any questions at all about these cost estimates, please contact us. Your staff has a copy of the Feasibility Study which has additional cost information.

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TABLE 1
 Cost Estimate Summary (+50/-30%) for Operation and Maintenance Costs for Selected Remedial
 Taylor Lumber and Treating Superfund Site, Sheridan, Of

Description	Quantity	Unit	Unit Cost	Total Cost	Annual O&M PV	Total O&M PV	Responsible Party for O&M Costs
1 Institutional Controls							
Legal and Clerical Fees	1	LS	\$10,000	\$10,000	\$218	\$6,533	PWPO/EPA w/DEQ review
Oversight	30	Year	\$1,000	\$30,000	\$653	\$19,600	DEQ
2 Engineered Asphalt Reseal Every 5 Years 1	30	Year	\$9,680	\$290,400	\$6,324	\$189,732	PWPO in accordance with PPA w/DEQ oversight
3 GW Extraction System and Stormwater Treatment 2	30	Year	\$50,666	\$1,519,980	\$33,103	\$993,076	PWPO in accordance with PPA w/DEQ oversight
4 GW Monitoring and Reporting 3 (16 wells)							
Monitoring Plan, QAPP, Health and Safety Plan	1	LS	\$15,000	\$15,000	\$327	\$9,800	EPA responsible for Mon Plan; DEQ resp. for QAPP and H&S Plan
Fieldwork	30	Year	\$3,500	\$105,000	\$2,287	\$68,602	DEQ
Analytical	30	Year	\$6,400	\$192,000	\$4,181	\$125,443	DEQ
Reporting	30	Year	\$5,000	\$150,000	\$3,267	\$98,002	DEQ
Subtotal			\$101,246	\$2,312,380	\$50,360	\$1,510,789	
Contingency Allowances (25%)			\$25,312	\$578,095	\$12,590	\$377,697	
Project Management and Support (10%)			\$10,125	\$231,238	\$5,036	\$151,079	
Total O&M Cost			\$136,682	\$3,121,713	\$67,986	\$2,039,565	

Notes

O&M PV costs are reported as present worth estimates given a 3% discount rate for a 30 year duration.
 Total cost represents cost over 30 years without discounting.
 Cost estimates are within +50 to -30% accuracy expectation.
 1 The cost of asphalt is currently significantly higher than the price shown, which is based on 2004 oil costs.
 2 Costs were developed in consultation with Pacific Wood Preserving, who bears certain responsibilities for this item per the PPA with EPA. These revised costs reflect groundwater treatment in the current system rather than use of the evaporator.
 3 Groundwater Monitoring Plan has not yet been developed.
 Prospective Purchase Agreement with EPA. These revised costs reflect groundwater treatment in the current system rather than use of the evaporator.
 LS = Lump Sum
 SY = Square Yard
 GW = Groundwater
 O&M = Operations and Maintenance
 PV = Present value

TABLE 1 (continued)
 Cost Estimate Summary for Offsite Remedy
 Taylor Lumber and Treating Superfund Site

Operation and Maintenance Costs for Selected Remedy

Description	Quantity	Unit	Unit Cost	Total Cost	Annual O&M PV	Total O&M PV	Responsible Party for O&M Costs
1 Institutional Controls							
Legal and Clerical Fees	1	LS	\$10,000	\$10,000	\$218	\$6,533	PWPO
Oversight	30	Year	\$1,000	\$30,000	\$653	\$19,600	DEQ
2 Engineered Asphalt Reseal Every 5 Years ²	30	Year	\$9,680	\$290,400	\$6,324	\$189,732	PWPO
3 Storm Water Treatment and GW Extraction System ³	30	Year	\$50,666	\$1,519,980	\$33,103	\$993,076	PWPO
4 GW Monitoring and Reporting (16 wells)							
Monitoring Plan, QAPP, Health and Safety Plan	1	LS	\$15,000	\$15,000	\$327	\$9,800	DEQ
Fieldwork	30	Year	\$3,500	\$105,000	\$2,287	\$68,602	DEQ
Analytical	30	Year	\$6,400	\$192,000	\$4,181	\$125,443	DEQ
Reporting	30	Year	\$5,000	\$150,000	\$3,267	\$98,002	DEQ
Subtotal			\$101,246	\$2,312,380	\$50,360	\$1,510,789	
Contingency Allowances (25%)			\$25,312	\$578,095	\$12,590	\$377,697	
Project Management and Support (10%)			\$10,125	\$231,238	\$5,036	\$151,079	
Total O&M Cost			\$136,682	\$3,121,713	\$67,986	\$2,039,565	
Total Cost of Selected Remedy						\$7,749,392	

Notes

Capital cost estimates are not discounted because the construction work will be performed in the first year.

O&M PV costs are reported as present worth estimates given a 3% discount rate for a 30 year duration.

Total cost (in O&M section) represents cost over 30 years without discounting.

Cost estimates are based on soil volume estimates which may be refined when remedy is designed.

Cost estimates are within +50 to -30% accuracy expectation.

¹ Includes mobilization/demobilization costs.

² The cost of asphalt is currently significantly higher than the price shown, which is based on 2004 oil costs.

³ Costs were developed in consultation with Pacific Wood Preserving, who bears certain responsibilities for this item per the

Prospective Purchase Agreement with EPA. These revised costs reflect groundwater treatment in the current system rather than use of the evaporator.

LS = Lump Sum

SY = Square Yard

CY = Cubic Yard

GW = Groundwater

O&M = Operations and Maintenance

PV = Present value