



Rapid Response

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Rapid Response Research **Pollution Prevention Opportunities for Manufacturing of Wood Utility Poles**

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Request

What are the pollution prevention opportunities for manufacturing wood utility poles? We are interested in manufacturing process itself (excluding forestry, log selection, transport to and from the manufacturing facility, and end of life disposal).

Background

A utility pole yard receives incoming logs, which are delivered by truck and rail and stored in stacks or piles. Logs may be handled onsite by rail-mounted cranes, large wheeled log trucks, forks, or pettibones/related. Logs are debarked, sorted and/or graded, and selected (based on customer requirements), for specific framing elements and for a specific treatment process. The treatment protects the future utility pole against rot, decay, and pests. Additional operations may include installation of framing devices, transducers, or other customer-specific installations.

Opportunities

Some processes and potential opportunities are listed below.

Log Yard Maintenance

According to P2pays, paving log yards is helpful in reducing soil contamination, soil erosion, and for management of dust control. Bark and chips that do fall onto the ground will be less likely to become contaminated. Paved areas also allow bark and chips to be collected for use. Log flumes on pavement also reduce soil loading.

Log Yard Delivery Specifications

Work with the foresters (internal or external) to ensure standard log sizes. Rigidly enforce delivery standards.

Log/Pole Movement & Storage

- Ensure acceptable inbound logs are peeled as soon as possible as unpeeled logs are more prone to insect damage.
- Optimize yard layout; fuel usage can be significant. And, distance driven is a major factor in fuel usage as well as maintenance costs. Reduce fuel and truck maintenance costs by designing log yards to reduce distance driven. Time and material flow studies can identify ways to reduce fork truck travel and travel time. In one log yard that was handled entirely by log trucks, an estimate of the miles traveled annually by log trucks totaled 17,000 miles. Source: <http://www.p2pays.org/ref/09/pulp/page10.html>.
- Implement and enforce fuel-efficient driving practices for pole transport within the yard, e.g., minimize rapid acceleration and incessant braking, minimize idling.
- Use ultra low sulfur diesel in heavy equipment.
- Conduct timely maintenance on heavy equipment and other vehicles.

- Do not leave transport equipment running only to keep a cab heated or engine warm. Consider an auxiliary cab heater, and plug-in engine heaters during winter.
- Ensure up to date emissions control or emissions reduction equipment is installed on yard vehicles.
- Minimize use of hooks for movement of logs – if this results in defects.
- Consider purchasing and using anti-checking devices for each end of the pole.
- To prevent mold, store log piles on raised blocks with spacers between each stacked log.

Energy & Fuel Efficiency & Conservation

- Ensure lights/computers/lab equipment are turned off at night.
- Are boilers low NOx emitters? Is heat recovered?
- Evaluate motor and pump efficiency; install variable frequency drives.
- If older-generation diesel engines are used, consider electronically-controlled, fuel-injected diesel generators.
- Implement leak detection and nozzle inspections for compressed air systems.
- Install vendor-misers on vending machines; unplug internal lamps and ballasts.

Water Efficiency & Conservation

- Shut off process water when not in use.
- Reduce losses (fix leaks)
- Reuse when possible
 - Can debark water be filtered and reused for some other purpose – such as a log flume? Irrigation? Cooling?
- Collect rainwater for use on site.
- Can water from some other plant operation be routed for use in debarking?
- Is treated stormwater or wastewater acceptable for use on site? (May require regulatory evaluation).

Debarking (or Peeling) and Incising

- Look for energy reductions
 - Always turn off equipment when not in use.
 - Evaluate motor efficiency and heat recovery
 - Are variable frequency drives installed on motors?
- Can water from some other plant operation be used for debarking? Can debark water be filtered and reused for some other purpose – such as a log flume? Or irrigation? Cooling?
- Is there a use (internal or externally) for bark /chips? If not, consider posting this material on an industrial exchange website (See EPA's list of [International and National Materials Exchanges](#)).
- Utilize diligent maintenance /[Total Productive Maintenance \(TPM\)](#) to ensure longevity of saw blades and other equipment.
- Safeguard saws and other equipment from undue wear and damage that would otherwise result from stones, metal and other such contraries embedded in the bark.
 - If the yard tends to commonly receive logs that have nails or wire imbedded in the logs, consider an electronic detector to protect peeler equipment.

Treatment Chemicals/Preservatives

- Evaluate an alternative carrier oil with reduced petroleum-based formulation.
- Optimize treatment times for batches; overtreating requires more chemical.
- If using a rot- and pest-resistant wood species (such as Western Cedar), is it possible to only treat the butt end of the pole?
- Use centralized tank farms rather than having chemical storage in numerous places around the yard.
- Ensure good housekeeping and secondary containment. Chemical storage, treatment sites, and tanks should be situated in containment areas for example, a covered, walled, concrete area beneath

which there is an impermeable membrane. Ensure any spills into this area will drain into a tank / sump, located in a contained area from which leaks can be detected.

- Recapture drippings from drying post-treatment. (See stormwater section below).
- Minimize non-process traffic on the drip pad.
- If the treatment facility is covered and/or enclosed (recommended as well-designed facility in [EPA's sector notebook](#), page 66), is ventilation adequate?
- Ensure drip pads contain all drippage, are free of cracks and gaps, and are cleaned and inspected routinely.
- Minimize dust, bark, and other debris on the pole surface prior to treatment, to minimize debris from accumulating in the treatment system.
- Are there alternative treatment chemicals? *Note:* changes in treatment chemicals may be restrictive due to capital investment for different chemicals, or customer requirements that cannot be influenced or changed.

Additional references on treatment options:

- Technical Memorandum, EIP Associates, **Alternatives to Pentachlorophenol-Treated Utility Poles**, April, 1999, <http://www.city.palo-alto.ca.us/civica/filebank/blobdload.asp?BlobID=3643>
- EPA Office of Compliance Sector Notebook Project: Profile of the Lumber and Wood Products Industry. <http://www.epa.gov/Compliance/resources/publications/assistance/sectors/notebooks/lmbrwdsn.pdf>
- Biotrans Field Liners, <http://biotrans-uk.com/enter.php?http://www.biotrans-uk.com/biotrans-products/biotrans-index.php>
- PBT Reduction Strategy: Progress Report to City Council City of Seattle, Office of Sustainability & Environment. *Pole liners act as a barrier between treated wood and environment.* www.seattle.gov/environment/Documents/PBTStrategy3-07-03.pdf
- PPL Field Liners - Seattle City Light Case Study www.pplfieldliners.com/seattle_city_lights.htm

Minimize/Manage Other Hazardous Materials

- Use good housekeeping and inventory control for chemical storage.
- Routinely inspect tanks, mixing systems, treating cylinders, drip pads, and spill containment for leaks.
- Establish just in time delivery or order quantities that ensures no expired materials.
- Are there less toxic, aqueous, or bio-based options for:
 - Solvents, part washing detergents,
 - Aerosol paints if used in pole marking
 - Hydraulic fluid/equipment oils

Hazardous Waste Management

- Ensure sample cores from treated poles are segregated from un-treated wood streams.
- Do not allow sample cores or other scrap from treated poles to contaminate soil.
- Consider oil and solvent recycling.
- If legacy chemicals are stored in any laboratory areas, conduct a lab cleanout.
- Upgrade to automated lab equipment to reduce chemical inputs associated with analysis.

Solid Waste/Recycling

- Is the yard getting the highest-value end uses for wood waste? Is there a mill close by that could use defect logs (which provides a higher value than firewood, but requires quick movement out of the yard)
- Keep chips and bark as dry as possible if used for fuel.

- If wood chips and bark become contaminated with soil, making them less valuable as a fuel source, they can be cleaned in vibratory screening systems.
- Ensure any administrative areas are collecting office paper/alum cans, etc. for recycling.

On-Site Wastewater Treatment

- Are the least toxic water treatment chemicals being used?
- If carbon is used in treatment, is it regenerated instead of purchasing new?
- Is there any permissible onsite reuse option for the treated water? (This may require working with local agencies to ensure regulatory compliance).

Ground Maintenance/Stormwater

- If dirt yard requires dust control, see [Dust Palliative Selection and Application Guide](#) for minimizing environmental impacts.
- If paved yards, use biofiltration around perimeter/practice proper storm management.
- Use integrated pest management or mulch to control weeds.
- Take steps to prevent, minimize, and control effluents from treated poles including:
 - Scrub down trucks/lifts/equipment on the drip pad;
 - Slope and drain areas around any treatment equipment in a manner that allows return of treatment chemicals to the treatment process;
 - Seal any holes or cracks in concrete or asphalt areas that are subject to wood treatment chemical contamination;
 - Elevate stored treated wood to prevent contact with stormwater/run-off;
 - Immediately following treatment, allow treated poles to drip for 30 minutes or longer, in a manner that allows return of treatment chemicals to the treatment process;
 - Store treated, dripped poles in a covered, paved area for 24 hours (if possible), and longer in cold weather, before placement in outside storage.
- Take steps to prevent, minimize, and control effluents from stored timber including:
 - Contain runoff from log yards through use of impervious surfaces, sealed joints, and impervious spill containment;
 - Use impervious curbs to prevent leaching of contaminated waters into the soil and groundwater;
 - Line log ponds to prevent contaminants leaching into the soil and groundwater;
 - Recycle irrigation water to limit effluent releases to ground and surface waters;
 - Segregate stormwater from process areas from stormwater in non-process areas;
 - Perform catch basin maintenance (cleaning/consider filters); and,
 - Is there a stormwater treatment plan? See an [example plan](#) for a sawmill.

Wood Dust Inhalation

- Inhalation “may cause irritation, asthma, allergic reaction, and nasopharyngeal cancer amongst wood processing workers. The potential hazard to human health depends on the type of wood being processed with the wood from some tree species having a more serious potential impact than others (e.g. hardwoods, such as oak, beech, teak, mahogany, walnut, mahogany, and birch). Dust exposure should be prevented and controlled through the adoption and maintenance of effective extraction and filtration systems as described in the ‘Environment’ section above and supplemented by the use of Personal Protection Equipment (PPE) such as masks and respirators, as necessary.” Source: [Environmental, Health, and Safety Guidelines for Sawing and Manufactured Wood Products](#) (by the International Finance Corporation, 2007).

References & Additional Resources

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