FACT SHEET FOR THE FRESH FRUIT PACKING GENERAL PERMIT

Issued: June 11, 2009
Effective: July 2, 2009
Expiration: July 1, 2014

SUMMARY

The Washington State Department of Ecology (Ecology) has determined to reissue the Fresh Fruit Packing General Permit. This general permit applies to the entire fresh fruit packing industry in the state of Washington except for those that have obtained individual permits from Ecology. Under this general permit, wastewater discharges from permitted facilities are subject to certain Treatment/Disposal Methods (TDMs) and effluent limitations. Compliance with this general permit may require permitted facilities to install and implement pretreatment facilities, Best Management Practices (BMPs), and/or any other tools that may be deemed necessary by Ecology in order to carry out the provisions of this general permit. The proposed terms, limitations, and conditions contained herein are tentative and may be subject to change and subsequent public hearings. Facilities covered under this general permit will not be relieved of any responsibility or liability at any time during the life of this general permit for violating or exceeding state water quality standards, or any other local, state, or federal regulations and/or standards. Facilities not accepted under this general permit will be required to apply for an individual permit from Ecology. Any fresh fruit packing facility not covered under either this general permit or an individual permit will be considered to be operating without a discharge permit and subject to potential enforcement action.

PUBLIC COMMENT PERIOD AND INFORMATION

A Public Notice of Draft (PNOD) was published in the State Register and the legal sections of the Yakima Herald-Republic and Wenatchee World on March 4, 2009 and again in the newspapers on March 11, 2009. The public comment period started March 11, 2009 and ended April 13, 2009. Two public hearings concerning the draft permit were held as well. The first public hearing was held in Yakima on March 12, 2009. The second public hearing was held in Wenatchee on March 13, 2009. One hour workshops to explain proposed changes and to answer any questions were held immediately preceding both hearings.

Interested persons were invited to submit comments regarding the proposed reissuance of the Fresh Fruit Packing General Permit. Comments on the general permit may have been given at the public hearings as either written or oral testimony. Written comments may have also been submitted to Ecology until the comment period ended April 13, 2009. The testimonials and comments received during this comment period are located in Appendix B.
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INTRODUCTION

This fact sheet is a companion document designed to provide the basis for reissuance of the Fresh Fruit Packing General National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge (SWD) Permit. The Washington State Department of Ecology (Ecology) is proposing to reissue this general permit, which will allow the discharge of wastewater from the fresh fruit packing industry into waters of the state of Washington, pursuant to the provisions of chapters 90.48, 90.52, and 90.54 Revised Code of Washington (RCW) and the Federal Water Pollution Control Act (FWPCA) as amended. This fact sheet explains the nature of the proposed discharges, Ecology's decisions on limiting the pollutants in the wastewater, and the regulatory and technical basis for these decisions. Ecology originally issued this general permit on February 10, 1994, reissued it on June 15, 1999 and again on June 15, 2004. Ecology mailed application forms for renewal of coverage under this general permit to all Permittees on July 11, 2008. Completed forms were required to be submitted to Ecology by January 2, 2009, which is 180 days prior to expiration of the current permit.

The Federal Clean Water Act (FCWA, 1972 [later modifications 1977, 1981, and 1987]) established water quality goals for the navigable (surface) waters of the United States. One mechanism for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the United States Environmental Protection Agency (EPA). The EPA authorized the state of Washington to manage the NPDES permit program in our state. Washington’s legislature accepted the delegation and assigned the power and duty for conducting NPDES permitting and enforcement to Ecology. The legislature defined Ecology’s authority and obligations for the wastewater discharge permit program in 90.48 RCW.

Ecology decided to issue a general permit for the fruit packing industry because of the:

- The similar wastewater characteristics among facilities.
- The uniform discharge conditions to which all facilities would be subject.
- The significant reduction of resources necessary for general permit issuance and management as compared to individual permits. However, individual permits will still be applied in those instances where a facility requires more detailed guidance or when an individual packer so desires and Ecology approves.

The regulations adopted by Ecology in regards to this general permit include the following chapters:

- Waste Discharge General Permit Program, chapter 173-226 Washington Administrative Code (WAC)
- National Pollutant Discharge Elimination System Permit Program, chapter 173-220 WAC
- Water Quality Standards for Surface Waters of the State of Washington, chapter 173-201A WAC
- Water Quality Standards for Groundwater of the State of Washington, chapter 173-200 WAC
- Sediment Management Practices, chapter 173-204 WAC
- 40 CFR 131.36

These regulations require that an industrial facility obtain a permit before discharging wastewater to state waters. They also help define the basis for limits on each discharge and for performance requirements imposed by the permit.
Under the NPDES permit program, Ecology must prepare a draft permit and accompanying fact sheet and make them available for public review before final issuance. According to chapter 173-220-050 WAC, Ecology must also publish a Public Notice of Draft (PNOD) telling people where they can read the draft permit, and where to send their comments, during a period of thirty days. See Appendix A - Public Involvement for more details about the PNOD and comment procedures.

Representatives of the industry have reviewed this fact sheet and draft permit. Ecology corrected errors and omissions identified in this review before going to public notice. After the public comment period ends, Ecology may make changes to the draft permit in response to comments submitted. In Appendix B – Comments Received and Response to Comments, Ecology will summarize the comments submitted (which includes testimonials from the public hearings), write a response for each of the comments, and summarize any permit changes that occurred due to the comments.

BACKGROUND INFORMATION

TECHNOLOGY-BASED EFFLUENT LIMITS

Sections 301, 302, 306, and 307 of the FWPCA established discharge standards, prohibitions, and limits based on pollution control technologies. These technology-based limits are "Best Practical Control Technology" (BPT), "Best Available Technology Economically Achievable" (BAT), and "Best Conventional Pollutant Control Technology Economically Achievable" (BCT). Compliance with BPT/BAT/BCT may be established using a "Best Professional Judgment" (BPJ) determination.

Washington State has similar technology-based limits which are described as; "All Known, Available, and Reasonable Methods of Prevention, Control, and Treatment" (AKART). AKART is referred to in Washington State law under chapters 90.48.010 RCW, 90.48.520 RCW, 90.52.040 RCW, and 90.54.020 RCW. The Federal technology-based limits and AKART are similar, but not equivalent. AKART may: (1) be established for an industrial category or on a case-by-case basis; (2) be more stringent than Federal regulations; and (3) include not only treatment, but also Best Management Practices (BMPs) such as prevention and control methods (i.e., waste minimization, waste/source reduction, or reduction in total contaminant releases to the environment). Ecology and the EPA concur that historically, most discharge permits have determined AKART as equivalent to BPJ determinations.

WATER QUALITY-BASED EFFLUENT LIMITS

Chapter 90.48.035 RCW authorizes establishment of water quality standards for waters of the state. Washington State has implemented groundwater quality standards in chapter 173-200 WAC. Washington State has also implemented surface water quality standards in chapter 173-201A WAC. All waste discharge permits, whether issued pursuant to NPDES or SWD regulations must prevent damage to waters of the state and include conditions so that all authorized discharges meet Washington State water quality standards. Both surface and groundwater standards include an antidegradation policy, which requires Ecology to protect existing and designated uses. Implementation of the surface water antidegradation policy is discussed in more detail on pages 56-57 of this fact sheet.

Discharges from the fresh fruit packing industry may contain pollutants which, in excessive amounts, have a reasonable potential to cause, or contribute to, violations of Washington State water quality standards due to the presence of, but not limited to, Total Dissolved Solids (TDS), BOD₅, chlorine,
turbidity, oxygen demand, high temperature, high or low pH, or toxic materials. Ecology has determined that if the fruit packing industry properly treats and disposes of its wastewater as required by the general permit’s terms and conditions, it will: (1) prevent permit backsliding; (2) ensure compliance with Washington State water quality standards; (3) protect POTW facilities and by-products; (4) maintain and protect the existing characteristic beneficial uses of the waters of the state; and finally (5) protect human health. Ecology may reopen the general permit if new information collected during the term of this general permit indicates violations of water quality.

**RECEIVING WATER IDENTIFICATION**

Activities from the fresh fruit packing industry may potentially affect both surface waters and groundwater in the state of Washington. The small percentage of fresh fruit packing facilities that discharge directly or indirectly to surface waters must meet the state water quality standards for surface waters. In order to protect them, chapter 173-201A WAC ascribes all surface waters a designated use, narrative criteria, and an antidegradation policy. Based on the use designations, numeric and narrative criteria are assigned to a water body to protect the existing and designated uses. Ecology must condition permits to maintain and protect existing and designated uses at all times. Permits must not allow degradation that would interfere with, or become injurious to, existing or designated uses for a water body. The designated uses in chapter 173-201A WAC are separated into two separate categories, fresh and marine waters. The fresh water designated uses are: aquatic life uses, recreational uses, water supply uses, and miscellaneous uses. The marine water designated uses are: aquatic life uses, shellfish harvesting, recreational uses, and miscellaneous uses. The antidegradation policy is discussed in more detail in the “surface water” section of this fact sheet.

The larger percentage of fresh fruit packing facilities which discharge directly or indirectly to groundwater must meet at a minimum, all the state groundwater quality standards as given in chapter 173-200 WAC. Fresh fruit packing industry dischargers must not substantially or significantly degrade groundwater which is generally high quality. For discharges which contain complex synthetic chemicals, the groundwater standards require that no significant change is allowed above background water quality. A significant change occurs when a contaminant level increases above background water quality levels, while using the lowest quantifiable analytical method. For discharges which contain other chemicals, the groundwater standards require that no substantial change of background water quality or exceedance of any listed chemical criterion is allowed. A substantial change occurs when a chemical contaminant level increases above background water quality.

**DESCRIPTION OF THE FRESH FRUIT PACKING INDUSTRY**

**TYPES OF FACILITIES OR DISCHARGERS COVERED**

Every new or existing fresh fruit packing facility which receives, packs, stores, and/or ships either hard or soft fresh fruit, and discharges wastewater (with the exception of discharges of only domestic wastewater or discharges only to a delegated pretreatment POTW) must apply for and obtain coverage under either this general permit or an individual NPDES/State Waste Discharge Permit.

Any facility as described above, which is located on the Colville Reservation, may apply for coverage of only non-surface water discharges under this general permit. Discharges to surface water on the Colville Reservation remain under the jurisdiction of the EPA.
GEOGRAPHICAL AREA OF COVERAGE

For the purposes of this general permit, the state's fresh fruit packing industry is defined as those commercial facilities which receive, pack, store, and/or ship either hard or soft fruit. Although the industry is primarily located in the state's centralized fruit growing region along the Yakima, Columbia, Wenatchee, and Okanogan Rivers, this general permit covers the entire state of Washington. This fact sheet will primarily discuss apple and pear packers; however some information may also relate and apply to the packing of other fruits, especially stone fruits, since they are typically packed at the same facilities. Any differences relative to the varying fruit types in packing operations and methods will be noted where appropriate.

HISTORY

Washington State is a nationally recognized leader in fruit production and accounted for 57% of apples, 51% of sweet cherries, and 46% of pears grown in the United States in 2007. The state's primary fruit products are apples and pears, which are both hard fruits. Washington State produced 2,600,000 tons of apples and 402,000 tons of pears during the 2007 harvest. 2007 soft fruit production in tonnages include: grapes (376,000), cherries both sweet and tart (162,750), peaches (18,500), prunes and plums (4,200), nectarines (14,000), and apricots (7,200). Berries are also produced in fairly high quantities in Washington State. (Non-citrus Fruits and Nuts 2007 Summary, 2008, United States Department of Agriculture, compiled by National Agricultural Statistics Service, pp. 11,20,22,24,36,38,45,51, and 58).

Improvements in postharvest packing and shipping methods are helping to increase world demand, which has allowed the industry to develop trading relationships with numerous international markets. Globalization has also led to increased competition in the market. This increased competition combined with other factors has resulted in some consolidation within the industry. The number of permitted facilities statewide has declined from a high of 285 in 1996 to 183 in 2008.

While some fresh fruit packers already used proper Treatment/Disposal Methods (TDMs) (i.e., lined evaporative lagoons and land application) prior to issuance of this general permit in 1994, some of the industry's disposal practices did not meet the general permit terms and conditions. Many fresh fruit packers typically disposed of wastewater to sites such as drainfields, dry wells, ditches, bin storage lots, unlined ponds/lagoons, land application sites, both private (on-site) and municipal domestic sewage treatment facilities, and surface waters. Some of those disposal practices posed potential contamination problems to Washington State’s ground and surface waters, and in some cases caused substantial upsets at Publicly Owned Treatment Works (POTW's).

Since 1994, Ecology has used this general permit to identify the acceptable BMPs and proper TDMs for the industry's wastewater discharges in order to protect state waters. The original general permit introduced the concept of wastewater treatment, in conjunction with disposal. Fresh fruit packers have significantly reduced the quantity of pollutants discharged into waters of the state by using proper TDMs and BMPs. This fact sheet describes these TDMs in more detail starting on page 31.
COMPLIANCE WITH PERMIT

Permit compliance consists of two parts; submittal compliance (submitting required reports on time) and monitoring compliance (testing the wastewater to verify compliance within the permit effluent limits).

Monitoring compliance includes both non-reporting violations (failure to complete a required test) and effluent violations (actual exceedances of the permit effluent limits). Chart 1 below summarizes monitoring violations since this general permit was issued. Overall, fruit packers have improved compliance with effluent limit exceedances during the years from 2004-2008. However, non-reports increased, especially in 2006, 2007, and 2008. 2008 saw the highest number of non-reports since 1999, but 2008 also saw the lowest amount of effluent limit exceedances since this permit was issued.

WASTEWATER CHARACTERIZATION

The United States Department of Agriculture (USDA) conducted a postharvest chemical use survey in 2002, referencing the 2001 crop year for apples and pears stored. Table 1 below summarizes the major chemical use data for Washington State from that survey. Values are based upon 5,810.7 million pounds of apples stored and 1,070.6 million pounds of pears stored. (Agricultural Chemical Usage, Post harvest Applications, Apples and Pears, March 2003, USDA, National Agricultural Statistics Service, Ag Ch1 (03))
### TABLE 1 - Postharvest Chemical Usage

<table>
<thead>
<tr>
<th>Chemical</th>
<th>% of Crop Treated</th>
<th>Total Applied (1000 Lbs)</th>
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<tbody>
<tr>
<td><strong>APPLES</strong></td>
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<tr>
<td>Diphenylamine (DPA)</td>
<td>30.1</td>
<td>89.8</td>
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<tr>
<td>Thiabendazole (TBZ)</td>
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<td>15.1</td>
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<td>phosphoric acid</td>
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<tr>
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</tr>
<tr>
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</tr>
<tr>
<td>chlorine</td>
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<tr>
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<tr>
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<td><strong>PEARS</strong></td>
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<td>chlorine</td>
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<tr>
<td>Ethoxyquin®</td>
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<td>0.6</td>
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</table>

1 Insufficient or limited reports to publish usage data for acidic cleaner, alkaline cleaner, candida oeophila isolate, Captan®, fruit wax, organic cleaner, pseudomonas syringae ESC-10, pseudomonas syringae ESC-11, sodium chlorite, and sodium o-phenylphenoxide (SOPP).

2 Insufficient or limited reports to publish usage data for acidic cleaner, alkaline cleaner, candida oeophila isolate, Captan®, chlorine dioxide, citric acid, dodecylbenzene sodium sulfonate, fruit wax, hydrogen chloride, petroleum distillate, phosphoric acid, organic cleaner, pseudomonas syringae ESC-10, pseudomonas syringae ESC-11, silicone emulsion, and sodium hypochlorite.

### INDUSTRIAL OPERATIONS

#### WATER SOURCES

The fresh water utilized by the fresh fruit packing industry is obtained from municipal purveyors, reservoirs, surface water (i.e., Columbia River), and/or groundwater (i.e., private wells). The amount of water consumed during packing operations varies depending upon the facility size, operating policies, type of the cooling water system, water cost and availability, and even the condition of the harvested fruit. However, those fresh fruit packers utilizing a presize scheme typically use larger amounts of fresh water than those not using a presize scheme. This increase in water use is due primarily to the flumes, as well as some duplication of processes (washing and rinsing).

#### GENERAL PROCESSES

Industrial fresh fruit packing operations vary within individual packers due to customer preferences and the types/varieties of fruit being processed. However, the wastewater discharged from these
individual facilities is characteristically very similar. Fruit packing was historically seasonal, coinciding with the fruit harvest season, which generally begins in June (cherries) and ends in November (apples). However, with the advent of controlled atmosphere (CA) storage, the industry packs apples for almost the entire year.

When apples are freshly picked, the producer first collects them in wooden or plastic bins each containing approximately 25 boxes. These bins are subsequently stacked and trucked to warehouse facilities for final preparation, packing, and/or storage. Upon arrival at the packing warehouses, the apples will be handled in one of three ways: (1) immediately processed; (2) put into regular cold rooms (refrigeration only) for short-term storage; or (3) placed in CA rooms for intermediate or long-term storage after first being treated with antioxidants and/or fungicides. The stored apples are removed as needed from storage and after removal they are washed, waxed, packaged, and shipped to markets.

In the process of CA storage, the apples are placed in a sealed warehouse wherein the internal temperature is rapidly reduced to near 32 degrees. Simultaneously, the atmospheric oxygen content is reduced to as low as practical (generally less than 3%) by replacement with nitrogen gas. It has been discovered that a high humidity (90-95%) is advantageous during storage for maintaining quality. This type of storage has enabled the industry to maintain a high-quality marketable product throughout the entire year. This is in significant contrast to those apples held in regular cold storage which are marketable only for a few months following harvest, usually until January or February.

The process of storing fruit in either CA or regular cold storage requires substantial cooling capabilities. There are various cooling systems possible (i.e., Freon and ammonia phase change) with most using at least some Non-Contact Cooling Water (NCCW) for defrosting purposes. The fresh fruit packing industry has trended toward evaporative cooling systems in which water is recirculated through tall towers where captured heat energy is released through evaporation. Although these systems effectively reduce overall water consumption, recirculation of water can lead to "fouling" of the towers. Fouling is characterized by two principal occurrences; chemical scale formation (calcium and magnesium salts) and physical blockages (suspended solids, corrosion products, and microbial growth). These principal fouling problems are typically controlled by regular treatments with chemical products, some of which display toxic properties.

The utilization of both CA storage and evaporative cooling tower methods has significantly increased the marketability of fruit throughout the entire year. However, these same methods involve the use of chemical additives, some of which have a significant potential to cause degradation of surface and groundwater quality. Ecology has demonstrated that compliance with this Fresh Fruit Packing General Permit has contributed to the protection of waters of the state.

The fresh fruit packing industry's wastewater typically originates from the following areas, drenchers, float tanks, flumes, packing lines, cleanup processes, and NCCW. Other sources of wastewater from fresh fruit packers can include sanitary sewage and stormwater. These wastewaters (process and others) are characterized below.

**POSTHARVEST/PRE-PACKING PROCESSES**

Fresh fruit picked in the orchards must be either immediately processed or go into storage (either CA or regular cold storage) for later shipment to market. During storage, fruit is susceptible to several
postharvest diseases and disorders. The most common *diseases* are: (1) Gray Mold, *Botrytis*, which enters through the calyx and wounds in the skin at the field site; (2) Blue Mold, *Penicillium*, which enters through wounds or bruises during storage; (3) Bull’s Eye Rot, which is a rot established on the fruit in the orchard; and (4) Mucor Rot, which is a soil-borne fungus that grows well at cold storage temperatures. The most common *disorders* are: (1) Scald, which is a brown discoloration of the skin caused by oxidation; and (2) Bitter Pit, another degradation of the fruit flesh. A more detailed description of common postharvest diseases and disorders can be found in *Market Diseases of Apples, Pears, and Quinces*, Agricultural Handbook No. 376, 1976, ARS-USDA.

In order to reduce the transmission of such diseases and the occurrence of disorders, the fresh fruit packing industry relies on various chemical treatments. Typically, the first application of a postharvest chemical is done at the "drencher" immediately prior to the fruit being placed in CA storage.

**DRENCHERS**

Certain varieties of apples are drenched with a solution containing the antioxidant Diphenylamine (DPA) combined with fungicidal chemicals such as Thiobendazole (TBZ), prior to CA storage. DPA is used to combat the apple disorder, scald, while TBZ is used to reduce postharvest decay. Calcium chloride can also be used as a post harvest drench to prevent disorders such as bitter pit in Granny Smith, Golden Delicious, Braeburn, and other varieties of apples which are susceptible to those certain disorders. Calcium chloride can be used with DPA and TBZ. Pears may be drenched with an Ethoxyquin® solution. The 2009 permit renewal includes two new fungicidal chemicals; Penbotec® (pyrimethanil) and Scholar® (fludioxonil). Both Penbotec® and Scholar® are typically used in postharvest drench solutions for apples, but can be used on pears as well. Another possible drencher additive is a food grade silicone defoaming agent, which is not considered environmentally detrimental at the concentrations typically used by the fresh fruit packing industry. Soft fruits such as peaches, apricots, nectarines, and plums (stone fruit) are not typically drenched before storage. Other soft fruit, such as prunes and berries, do not use any drench solution and are packed "dry". Still others, such as cherries and some varieties of pears, are rather "hydro-cooled," which usually involves drenching in cold water containing chorine or some other chemical.

There are two drenching methods, truck-drenching and bin-drenching. In **truck-drenching**, (typically used for processing more than 50,000 bins per year) the drench solution is applied to the fruit while still in bins on the truck. A typical truck-drencher has one 1500 to 3000 gallon storage tank with side and overhead coarse-spray nozzles. Drenchers are typically just used during harvest and must be drained periodically to remove dirt, sticks, leaves, organic wastes, and to recharge the chemical agents. The predominant method for determining when to drain is based on the number of bins processed and label instructions from the chemicals used. However, some facilities drain their drencher solutions when the chemical concentration in the solution has been determined to be “spent.” Applied drenching solution, which has cascaded down through the apples while still in the bins, is ultimately funneled by concrete berms on the floor of the drenching area into storage tanks. This collected drenching solution is then re-applied onto fresh bins of apples until a decision is made to drain out the solution and make up a new batch.

In **bin-drenching**, (typically used for processing less than 50,000 bins per year) the drench solution is applied to the individual bins of fruit (which have been removed from the truck) by spraying them while on a conveyor. A bin-drencher usually has one 500 to 1000 gallon tank.
This general permit requires the permittee to maintain records of all drencher wastewater discharges using either the **Batch Mix Record** form or an equivalent form which records the following information:

1. Batch number
2. Date the batch was mixed
3. Person responsible for making the batch
4. Total batch volume
5. Name and amount of all chemicals added to the batch
6. Date spent solution was discharged
7. Disposal site ID
8. Volume of spent solution discharged
9. Disposal area
10. Calculated application rate
11. TDM inspection results and comments about any abnormal conditions.

Miscellaneous solid orchard waste residuals such as soil, leaves, and twigs are usually present in the drencher wastewater. Since many of the chemicals used in drench solutions adhere strongly to soil particles, they may potentially accumulate in any resultant sludge. However, it has been demonstrated that drencher sludge does not designate as dangerous waste.

**PACKING PROCESSES**

When market orders for fresh fruit arrive, the packer opens either a CA or regular cold storage room. Fruit from regular cold storage can typically be shipped up to 90 days after harvest; whereas, CA fruit may be utilized anywhere from 90 to 300+ days after harvest. Whenever a storage room is opened, the stacked bins of fruit are removed as soon as possible and brought to the beginning of the packing lines.

**FLOAT TANKS**

Float tanks are used to remove the fruit from the bins. The number of float tanks per packing house usually ranges from one to four, ranging in size from 500 to several thousand gallons. The water in these tanks is typically discharged according to individual facility procedures. As each bin is completely submerged, the fruit floats out, thereby eliminating any excessive physical contact which might reduce marketability. The float solution disinfects the fruit prior to it entering one of two distinct, but similar, packing schemes; non-presize and presize.

Float tank water/solution used to float apples often contains no chemicals, is chlorinated, or is acidified. It may also contain one of the following: sodium hypochlorite (or other chlorine-based chemical), TBZ, Scholar®, and Penbotec®. Additional chemicals that may be used include, Dichloran® and Captan®. Gowan’s Allisan (Dichloran®) label (EPA Reg. #10163-5569) carries use direction for postharvest use for only apricots, carrots, nectarines, peaches, plums, sweet cherries, and sweet potatoes. During postharvest operations, residual concentrations are checked relatively often because these chemicals are typically adsorbed onto solids and organic sugars, which could degrade their effectiveness. Ecology has determined there is only minor, if any, chemical carry-over from CA storage to float tank wastewater.
When dealing with pears and "stone" fruits (i.e., peaches, nectarines, and apricots) chemicals are added to increase the water’s specific gravity. The chemicals/products typically used for this purpose are: lignosulfonate, sodium silicate, sodium sulfate, potassium carbonate, and potassium phosphate. Pear float tanks may also contain the fungicide, sodium o-phenylphenoxide (SOPP). The interval at which the float tank water/solution is emptied varies and depends on each specific packing operation's policy. Wastewater from pear packing float tanks may contain significant carry-over concentrations from the specific gravity enhancers and fungicides mentioned above. Lignosulfonate is especially prone to this, resulting in a potential for significant BOD₅ loading and color carryover in wastewater. The dark brown color from lignosulfonate can interfere with UV disinfection systems, pass through a POTW without being treated, and may have other biological impacts to small POTWs. Therefore, any wastewater (float or rinse) containing lignosulfonate is not allowed to discharge to POTWs with UV disinfection. A number of facilities have installed low-volume pre-rinse bars to return as much of the specific gravity enhancers to the float tank as possible.

As an alternative to chemical float enhancers, “floatless” rollover dumpers are used in some facilities. In this process, bins are placed in a cage and submerged in the tank where they are slowly rotated. A bottom chain moves non-floating fruit up to the exit flume. In addition to eliminating the need for float enhancing chemicals, rollover dumpers make it possible to apply fungicides such as SOPP in smaller in-line dip tanks, which can greatly reduce the amount of fungicide used. While rollover dumpers are expensive, savings in chemical costs help offset the expense.

**PACKING LINES**

Packing lines vary between fruit packing houses in the type and quantity of both chemical additives used and wastewater discharged. The fresh fruit packing industry typically uses a linear alkyl sulfonate (LAS) based detergent that washes and removes natural waxes, dirt, and other orchard residues from the fruit prior to further processing. Additional acidic or basic apple wash additives such as peracetic acid, phosphoric acid, sodium hydroxide, trisodium phosphate, sodium carbonate, etc., may be used.

Typically, the industry utilizes two distinct, but similar, packing line schemes: non-presize and presize. The non-presize scheme utilizes six steps, floatation, washing, rinsing, waxing, sorting, and final packaging. The presize schemes use basically the same steps, but in differing orders, and include two different presize methods corresponding to whether the presizing occurs before or after CA storage.

**Non-presize schemes** can be used with any fruit and can be utilized year round. For apples, the fruit is elevated or conveyed out of the float tank solution by means of a continuous large-mesh (approximately 2-inch) chain screen. This accomplishes both the drainage of excessive adhered float solution and the culling of under-sized or unmarketable fruit. Those marketable apples which remain on the screen will be dumped onto a conveyance system of horizontal cylindrical rollers, which lay perpendicular to the process pathway. Depending on their location in the process pathway, these rollers may be plain, covered by a sponge material, or covered with bristles (forming a brush). Next, the apples pass underneath a wash spray, which typically contains a detergent and/or another packing line chemical for the removal of soil and hard water spots. The rollers in this area are usually bristle-covered to physically aid in the effectiveness of the wash solution. The fruits are then rinsed with a spray of freshwater to flush off excess chemicals. The rollers at this point are typically uncovered, allowing drainage of the contaminated rinse water.
The fruit is finally moved across a series of sponge-covered rollers which absorb any remains of the rinse water. Sometimes, additional devices (i.e., fans, heaters, and dehumidifiers) are used to expedite the removal of adsorbed rinse water through evaporation. From this point on, the rest of the packing process is waterless.

Once dried, the apples pass through a wax spray on top of bristle-covered rollers. This type of roller physically assures application of the waxes, which are usually: shellac (fast-drying with high gloss), carnauba (usually for export), or a combination of the two. The wax spray may also contain a fungicide such as TBZ. Red apples are typically given an application of wax, while golden apples and pears are usually not. After passing through the “waxer,” the apples continue on top of regular rollers through a forced-air dryer/dehumidifier to assure wax fixation. They are then physically directed into specific lanes of movement, which guide the apples through the sorting process.

In the more modernized packing plants, the fruit next passes underneath either or both of the following opto/mechanical devices; a row of “electric eyes” which analyze the fruit for percent of color and/or a row of precise microprocessor-controlled scales for weight determinations. Each individual fruit is carried by a miniature bucket down parallel sorting lines and gently placed at a specific location, which has been calculated by the microprocessor according to various marketing categories pre-selected by the operator. This is in contrast to older facilities, where the fruit is still hand-sorted for both size and color.

At the end of the packing line, the fruit is given a final visual quality control check and placed into a variety of packaging containers including boxes, bulk bags, totes, and so on. These are then put into regular cold storage until time for shipment.

Presize schemes are used mainly with apples and can occur either before or after CA storage. Presize schemes are more extensive and tend to use greater quantities of water than non-presize schemes. This is because fruit conveyance is done by water "flumes" rather than the mechanical devices used in non-presize schemes. Flumes are generally only used by larger fruit packers (over 50,000 bins a year). Chlorination is often used to control spore build-up of postharvest decay fungi. However, total residual chlorine can potentially combine chemically with other waste products to produce toxic by-products (i.e., chloramines). A typical presize fruit packer utilizes a number of flumes at any one time, from 6 to 18. Flume dimensions may vary considerably and are usually 6 inches deep (4 inches of water), 24 inches wide, and from 10 to 40 feet long. The most important factor is that all sorting is completed separately of the packing line, which itself is nearly identical to that of the non-presize scheme.

When presizing occurs before CA storage, harvested fruit is brought from the fields and drenched with whatever drencher solution is preferred. The fruit is then floated, sorted, and packed or re-binned. The full bins are placed into CA storage. When market orders arrive, the bins of properly sized apples are retrieved from CA storage and sent through the non-presize scheme (as described above), with exception of sorting, since that has been previously completed.

When presizing occurs after CA storage, binned fruit is taken out of storage and then is floated, washed, rinsed, and sorted. Once the sorting has been accomplished, the apples are re-binned and placed into regular cold storage. When market orders arrive, the bins of properly sized apples are
retrieved from storage and sent through the non-presize scheme (as described above), with exception of sorting, since that has been previously completed.

NON-CONTACT COOLING WATER (NCCW)

CHEMICALS USED TO PREVENT FOULING

NCCW commonly requires some type of treatment, typically chemical-based in order to prevent biological or physical fouling. There are some techniques that are used in order to determine when and how much chemical treatment is needed. The first technique is to use a certain amount of chemical per a certain amount of time; the period of time being determined by noticing or “eyeing” the general condition of the water. Another technique is to release the chemical(s) based on a set volumetric measurement (X amount of chemical per Y gallons of water). Another technique involves the use of a probe that detects the conductivity of the water which indicates how much chemical treatment will be needed, if any at all (Cooling Tower Study: Facts and Lessons Learned, Washington State Department of Ecology [TREE], September 2007, p. 3). Automatic metering systems are also available. These devices help maintain proper dosing cycles to ensure that packers only use the minimum amount of chemical needed, this saves the packer excess chemical costs and also protects the environment.

The industry uses a wide variety of these chemicals in various combinations and concentrations. These chemical additives, by their nature, have the potential to exhibit toxicity in the receiving water. A study conducted in November 1991 by the EPA Region 1, Environmental Services Division on the toxicity of NCCW discharges in Massachusetts and New Hampshire, indicated that a majority of the NCCW discharges tested caused significant acute or chronic toxicity. Test results reported acute toxicity levels of Lethal Concentration 50 (LC50) = 3.4% effluent, and chronic toxicity levels of No Observed Effect Concentration (NOEC) = 2.5% effluent. Possible causes for the toxicity were investigated, including contaminated source water, presence of metals in the discharges, and the use of biocides or cooling water additives in the discharges. No direct correlation was found between these possible causes and the toxicity exhibited in each case. The EPA concluded that further study of these discharges was warranted and that state permitting authorities should implement monitoring to identify the toxicity sources in these discharges (Statement of Basis for the NPDES General Permit to Discharge Non-contact Cooling Water Into the Waters of the State of New Jersey, NPDES Permit No. NJ0070203, State of New Jersey Department of Environmental Protection and Energy).

Given the large number of chemicals and the potential synergistic effects of their combinations, Ecology concluded it would not practically regulate these additives individually in this general permit. Whole Effluent Toxicity (WET) testing will better demonstrate toxicity. For WET testing in this general permit, Ecology requires the Daphnid 24-hour static test (EPA test method: EPA-821-R-02-012). Facilities that wish to discharge NCCW (with chemical additives) to surface waters must pass the WET test mentioned above in order for that discharge to be covered under this general permit. WET testing is discussed in more detail on page 61 of this fact sheet.

Currently there exists, alternative non-chemical treatment technologies for NCCW. Some examples of these technologies are as follows, Ultrasound, Pulse-Power, and Ozone. Ultrasound is used as microbiological (bacteria/algae) control treatment in cooling water systems. When applied to NCCW, ultrasound frequencies that are greater than 16 kHz result in cavitations, creating high local pressures and temperatures. This causes light and highly reactive radicals to be emitted. Pulse-Power systems
can be used to control corrosion, scale, and bacteria/algae. These systems include a high frequency pulse generator (controller) and a reaction chamber. The controller introduces a high-frequency, time-varying electromagnetic field into the cooling water via a reaction chamber. This electrical field deteriorates the cell membranes, which kills bacteria and other pathogens. Ozone treatments help control scale and bacteria/algae growth in water cooling towers. Ozone treatment systems compress ambient air, then dry and ionize it to produce ozone. The ozone is then added to the circulating water in the tower (Cooling Tower Study: Facts and Lessons Learned, Washington State Department of Ecology [TREE], September 2007, pages 8, 9, and 10).

NCCW which contains priority pollutants, dangerous wastes, or toxics in toxic amounts, will only be permitted to discharge into lined evaporative lagoons. NCCW which does not contain priority pollutants, dangerous wastes, or toxics in toxic amounts, is permitted to be discharged to any of the six TDMs (following a passed WET test for surface water discharges). The discharge of NCCW is usually seasonal, with the peak discharge occurring during the fall when cold storage rooms are being filled. Discharge decreases dramatically after the storage rooms have been filled and also when the storage rooms are empty, which is usually during the summer months. A variety of distribution systems are used to discharge NCCW and they include sprinklers, surface flow and mixing with irrigation systems. Application rates of NCCW vary, but are limited to 1800 gallons/acre/day (0.066 inches/acre/day) to dust abatement and a maximum of 6000 gallons/acre/day (0.22 inches/acre/day) to land application.

If Ecology determines a facility is repeatedly discharging NCCW which poses a risk of significant degradation to groundwater due to site-specific factors, additional monitoring may be required through an administrative order. Additionally, that facility may be required to use an alternative TDM or apply for an individual wastewater discharge permit. Good process control, such as an automatic metering system, is essential in ensuring that proper dosing cycles are maintained.

**TOTAL DISSOLVED SOLIDS (TDS) IN NON-CONTACT COOLING WATER**

TDS, which affects the aesthetic value of groundwater, is a secondary groundwater criterion set at the Groundwater Quality Standard of 500 mg/L, established in chapter 173-200 WAC. The health risks associated with TDS, especially at the levels reported by most packers are low. Packers obtain water for NCCW from several sources including: private wells, surface waters, and municipal water systems. The TDS content of the source water sometimes exceeds the Groundwater Quality Standard criterion of 500 mg/L. During the cooling process evaporative losses concentrate the naturally occurring dissolved solids in the source water that sometimes results in TDS criterion exceedances.

TDS is generally considered a conservative pollutant. Given the complexity of soil forms and aquifer/soil interactions, it is difficult to generalize or predict the impact TDS will have on aquifer concentrations, especially after wastewater containing high levels of TDS has been discharged via land application. Given the reported TDS concentration levels, the implementation of BMPs, and the relatively low volumes of application, Ecology has determined a TDS effluent limit for discharges of NCCW to dust abatement, land application, and percolation systems is unnecessary. Quarterly monitoring of TDS for discharges to these TDMs will continue in this general permit. Systems should be operated to reach a reasonable balance between TDS concentrations and water conservation.
SANITARY WASTEWATER

Discharges of sanitary wastewater directly to either surface or groundwater are not allowed under this general permit. These wastes must be treated in an appropriate manner, typically being sent to either the local POTW or a specifically engineered on-site sewage treatment device (septic tank system). The practice of commingling sanitary and process wastewaters for any discharge other than to a POTW is prohibited.

STORMWATER

Stormwater, as well as some wastewaters (i.e., NCCW), may be discharged to surface or groundwater. However, if those stormwater or process wastewaters have been contaminated or treated with priority pollutants, dangerous wastes (i.e., antifreeze), or toxics in toxic amounts, then they must be appropriately treated and discharged in manner consistent with conditions in the general permit. EPA regulations concerning stormwater are contained in 40 CFR Parts 122, 123, & 124.

Fruit packers with industrial materials or products that are exposed to storm events (i.e., rain or snow) may be required to obtain the Industrial Stormwater General Permit. For more information please see Ecology’s brochure entitled: Stormwater Discharges Associated with Industrial Activity, Washington State Department of Ecology - Publication # 99-38.

Permittees that plan to expand and/or build on their facilities may be required to obtain the Construction Stormwater General Permit. If a construction activity will be disturbing one or more acres of land and will also be discharging stormwater off site into a water of the state, this will require the permit. For more information please refer to Ecology’s brochure entitled: How to Meet Ecology’s Construction Stormwater General Permit Requirements: A Guide for Construction Sites, Washington State Department of Ecology – Publication # 99-37.

POLLUTION PREVENTION/SOURCE REDUCTION

The industry should continue to examine the possibility of alternatives to reduce the need for, or cost of, wastewater treatment and/or disposal. There is a great deal of pollution prevention information available with details on ways to reduce or eliminate pollutants. Such methods include:

1. The alternative chemical substitution of environmentally safer products may simplify wastewater treatment and/or disposal. Although chemical substitution may sometimes initially appear to be more expensive, it may over time, result in substantial savings. For example, the relative cost coefficient for an environmentally safer product may be greater when based on disinfection only. However, when additional costs associated with treating any product residuals and by-products to achieve permit compliance are taken into account, it may make the more expensive, environmentally safer product more cost effective overall.

2. The use of alternative technology methods may have economic advantages over normal procedures. For example, the useful lifespan of a specific chemical or process water may be increased substantially through filtration and recycling, thereby reducing both production and/or disposal costs. Technologies for employing reclamation/reuse are also justified in order to achieve AKART for reducing waste loads in the effluent. Floatless pear dump tanks,
counter-current washes, pre-rinses, and other water management techniques may also be cost effective ways of reducing chemical and water usage. Integrated Fruit Production (IFP) may reduce the number or amount of chemicals needed. Thermofooging technology may also help reduce the need for drenching.

CHEMICALS ALLOWED FOR USE

Note: References to human health refer to those risks associated with impacts of wastewater discharges into waters of the state. It does not refer to risks associated with exposure to any chemical additive or ingestion of any chemical residue on the fruit.

CHLORINE-BASED CHEMICALS

**Calcium hypochlorite (CAS# 7778-54-3), sodium hypochlorite (CAS# 7681-52-9), and chlorine dioxide (CLO$_2$) (CAS# 10049-04-4)**

Calcium hypochlorite, sodium hypochlorite, chlorine dioxide, and other chlorinated chemicals are common additives and disinfectants used during the packing of fruit. Calcium hypochlorite is highly toxic to aquatic organisms (LC50 (96hr) = 0.16 mg/L for rainbow trout & LC50 (48hr) = 0.11 mg/L for daphnia magna). In rats, calcium hypochlorite is slightly toxic with an oral rat toxicity of Lethal Dose 50 (LD50) = 850 mg/kg. Sodium hypochlorite is also highly toxic to aquatic organisms (LC50 (96hr) = 0.18 mg/L for rainbow trout & LC50 (48hr) = .033-.048 mg/L for daphnia magna. In rats, sodium hypochlorite is moderately toxic with an oral rat toxicity of LD50 = 192 mg/kg.

Chlorine dioxide is a powerful oxidizing agent used as an alternative disinfectant for chlorine. It has 2.5 times the oxidizing capability of chlorine, and generates no chloramines or tri-halomethanes and inhibits the formation of chloroform. It is a greenish-yellow gas which is typically produced on-site due to its explosive nature. At large concentrations (above 10%) in air, it can explode upon contact with any ignition source. Oral rat toxicity studies show an LD50 = 292 mg/kg, which is moderately toxic. Chlorine dioxide is however, highly toxic to aquatic organisms (LC50 (96hr) = 0.15 mg/L for bluegill & LC50 (96hr) = 0.17 mg/L for fathead minnow). Industry sources indicate use concentrations are 1.0 – 2.0 mg/L. Off-gassing of chlorine can occur with the use of chlorine dioxide, so worker health should be considered. Human health concerns with the wastewater should be low when used at normal use concentrations.

Chlorine dioxide is a powerful oxidizing agent used as an alternative disinfectant for chlorine. It has 2.5 times the oxidizing capability of chlorine, and generates no chloramines or tri-halomethanes and inhibits the formation of chloroform. It is a greenish-yellow gas which is typically produced on-site due to its explosive nature. At large concentrations (above 10%) in air, it can explode upon contact with any ignition source. Oral rat toxicity studies show an LD50 = 292 mg/kg, which is moderately toxic. Chlorine dioxide is however, highly toxic to aquatic organisms (LC50 (96hr) = 0.15 mg/L for bluegill & LC50 (96hr) = 0.17 mg/L for fathead minnow). Industry sources indicate use concentrations are 1.0 – 2.0 mg/L. Off-gassing of chlorine can occur with the use of chlorine dioxide, so worker health should be considered. Human health concerns with the wastewater should be low when used at normal use concentrations.

Chlorine can form highly toxic chloramines upon contact with ammonia and/or nitrogenous compounds. However, fruit packing wastewaters generally lack significant amounts of ammonia and/or nitrogenous compounds. Residual chlorine, in the absence of ammonia, may also produce chloroform due to its reactivity with organic material. Residual chlorine has a strong adsorption to soil; therefore chlorine-based compounds are not expected to leach.

Total residual chlorine concentrations are of concern when using chlorine-based chemicals due to the fact that they are extremely toxic for aquatic organisms. In order to discourage high total residual chlorine concentrations, the fruit packing industry is encouraged to employ pollution prevention techniques, waste reduction techniques, and/or chemical substitution. These techniques should minimize the formation of potentially toxic or environmentally unsound waste streams and thereby protect the quality of ground and surface waters of Washington State.
Wastewater containing any chlorine-based chemical is allowed to discharge to any of the six of the TDMs, but total residual chlorine must be sampled for, if any chlorine-based chemicals are used.

The most stringent total residual chlorine discharge limit for dust abatement and land application is the dangerous waste regulation calculated maximum concentration limit of 10.0 mg/L. The general permit limits discharges to POTWs to 0.50 mg/L of total residual chlorine and discharges to percolation systems to 5.00 mg/L of total residual chlorine. Discharges to surface waters are limited to 0.019 mg/L of total residual chlorine, the acute freshwater water quality criterion. If a packer uses the diethyl-p-phenylene (DPD)/colorimeter test method (40 CFR Part 136) to measure this parameter, then the enforceable limit is the established quantitation level (analytical detection limit) of 0.05 mg/L due to the lack of a reasonably priced field test kit which can detect total residual chlorine at lower levels. A packer does not violate the permit when it measures a total residual chlorine value between 0.019 mg/L and 0.05 mg/L, but it must report the value as “less than 0.05 mg/L.”

If total residual chlorine concentrations exceed the above effluent limits then packers must dechlorinate the discharge. This can include such techniques as volatilization or chemical dechlorination with reducing agents such as sodium sulfite or other chlorine neutralizing chemicals.

**FUNGICIDES**

**Scholar® (fludioxonil) (CAS# 131341-86-1), 4-(2, 2-difluoro-1, 3benzodioxal4-yl-1H–pyrrole-3-carbonitrile)**

Scholar® is a postharvest fungicide that helps control the pathogens that cause postharvest diseases such as blue mold, gray mold, bull’s eye rot, rhizopus rot, bitter rot, sphacopipis rot, phacidopynis rot, and white rot to pome fruits (fleshy fruits that have seeds but no stone, such as an apple or pear). Fludioxonil is the active ingredient, which comes from the Phenylpyrrole chemical class. Scholar® can be applied in drenchers, dip tanks, and packing line spray systems. It is typically used in concentrations of up to 300 mg/L and can be used in conjunction with DPA, Ethoxyquin®, and TBZ. Scholar® is highly toxic to aquatic organisms (LC50 = 0.47 mg/l for rainbow trout and an LC50= 0.74 mg/l for bluegill). However, in rats, it is practically non-toxic (acute oral rat toxicity: LD50 rat = > 5050 mg/kg). Human health risks are low as it is a slight skin and eye irritant. It has an aerobic soil half-life of 143-220 days and in water it has a half-life of <10 days. Scholar® also has low mobility capabilities and therefore has a low potential to leach to groundwater.

Due to it being highly toxic to aquatic organisms, wastewater containing Scholar® is prohibited from discharging to any TDM other than lined lagoon, dust abatement, and/or land application. The strictest discharge limit for both dust abatement and land application will be the maximum normal use concentration rate of 300 mg/L, at an application rate of 1800 gal/acre/day, every other day, to a maximum of 30 applications a year.

**Penbotec® (pyrimethanil), (CAS# 53112-28-0), (4, 6–dimethyl–n phenyl–2–pyrimidinamine)**

Penbotec® is a postharvest fungicide that helps control blue mold, gray mold, phacidiopycnis rot, and other pathogens that are often found within pome fruits. Its active ingredient is pyrimethanil. Penbotec® can be applied in drenchers, dip tanks, and packing line spray systems. It is typically used at a concentration of 500 mg/L, but can be used in concentrations of up to 1000 mg/L and can be used
in conjunction with DPA. Penbotec® is moderately to slightly toxic to aquatic organisms (LC50 (96hr) = 10.56 mg/L for rainbow trout & an Effective Concentration 50 (EC50) (48H) = 2.9 mg/L for daphnia magna). However, in rats, its acute oral toxicity is quite lower (oral rat toxicity LD50 (rat) = > 2000 mg/kg). Swallowing Penbotec® is harmful to humans, but is non-irritating to the eyes and skin. It is unlikely to leach to groundwater and has a half-life of 37 days.

Wastewater containing Penbotec® is prohibited from discharging to any TDM other than lined lagoon, dust abatement, and land application. This general permit contains two different discharge limits for wastewater containing Penbotec®, the first being 500 mg/L, with an application rate of 1800 gallons/acre/day, every other day, to a maximum of 30 applications per year and a maximum of 1000 mg/L, with an application rate of 1800 gallons/acre/day, every other day, to a maximum of 15 applications per year. See Tables 4 and 10 of this fact sheet for more information regarding the discharge limits for wastewater containing Penbotec®.

**FUNDS Pretreatment for Wastewater Containing Penbotec®**

The producers of Penbotec® have created the FUNgicide Decontamination System (FUNDS), which is a pretreatment process for wastewater containing Penbotec® and/or DPA. The FUNDS procedure can degrade the active ingredients of Penbotec® (pyrimethanil) and DPA to concentrations below 1 mg/L. Although FUNDS degrades pyrimethanil and DPA to low concentrations, wastewater containing Penbotec® and/or DPA that has undergone the FUNDS pretreatment will only be allowed to discharge to lined lagoons, dust abatement, and land application within permit limits. Ecology and the industry will conduct research and discussions during the permit cycle to determine if in the next permit wastewater containing Penbotec® that has undergone the FUNDS pretreatment will be allowed to discharge to POTWs.

**Captan® (CAS# 133-06-2), (4-cyclohexane-1,2-dicarboximide,N-((trichloromethyl)(thio))**

Captan® is a fungicide usually applied on stone fruits and berries. It can also be applied as a postharvest dip to apples, cherries, and pears. Captan® is utilized at concentrations up to a maximum of 1200 mg/L. It is highly toxic to aquatic organisms (LC50 (96hr) = 0.073 mg/L for rainbow trout). However, in rats, Captan® is practically non-toxic (oral rat toxicity, LD50 = 8400 to 15,000 mg/kg). Human health risk appears to be moderate due to low dermal toxicity and carcinogenic potential. It readily adsorbs and is practically immobile in soil and is also unlikely to leach. It degrades by both chemical and biological methods. Captan® used at concentrations of up to 250 mg/L, is not persistent in moist soil and has a half-life from 1 to 5 days; however, in dry soil it has a half-life of up to 2 months. Captan® also has a half-life in water from 10 minutes to 12 hours. However, due to its toxicity, it is prohibited from entering waters of the state.

Due to it being highly toxic to aquatic organisms, wastewater containing Captan® is prohibited from discharging to any TDM other than a lined evaporative lagoon, dust abatement, or land application. The strictest discharge limit for dust abatement and land application is based on the dangerous waste regulation calculated maximum concentration limit of 10.0 mg/L.

**Dichloran® (CAS# 99-30-9), (2, 6-dichloro-4-nitroaniline)**

Dichloran® is a fungicide that is usually applied on stone fruits and berries, by way of the product Botran® (a combination of Dichloran® and Captan®). Due mostly to its Captan® component,
Dichloran® is slightly to moderately toxic to aquatic organisms (LC50 = 15.03 mg/L for bluegill and an LC50 = 2.09 mg/L for rainbow trout). Human health risks are assumed to be moderate due to low acute toxicity and low dermal toxicity. A "No Effect" level of 1000 mg/kg has been seen in rat toxicity studies. The chemical is tightly adsorbed on soil particles and organic matter with a corresponding half-life for from 1-3 weeks under flooded conditions, and 13-30 months under dry soil conditions. Due to low mobility, it is not expected to leach. It has a hydrolysis half-life of 72 days, an aerobic soil half-life of 549 days, and an anaerobic soil half-life of 66 days. This potentially long half-life supports Dichloran® being classified as highly persistent and non-biodegradable. Any available degradation is probably due to microbial action, which must develop over time. The addition of microbial-enhancing substances (i.e., glucose, alfalfa, and rice straw) decreases its persistence in soil. In water, Dichloran® has shown no tendency to hydrolyze or volatilize.

Due to its Captan® component and aquatic toxicity, wastewater containing Dichloran® is prohibited from discharging to any TDM other than a lined evaporative lagoon, dust abatement, or land application. The strictest discharge limit for dust abatement and land application is based on the dangerous waste regulation calculated maximum concentration limit of 10.0 mg/L.

**Thiabendazole (TBZ) (CAS# 148-79-8)**

TBZ is a fungicide used to control blue and gray molds. It is typically used in conjunction with DPA in drencher solutions at concentrations of up to 615 mg/L, which is the maximum label use rate. It can also be used in a line spray or added to the wax coating to prevent bacterial action.

TBZ is a General Use Pesticide (GUP) and is in EPA toxicity class III (slightly toxic). It was declared eligible for registration by the EPA in 2002. It is moderately to slightly toxic to aquatic organisms, (LC50 (24hr) = 10.0 mg/L for Coho salmon, an LC50 = 24.9 mg/L for bluegill, and an LC50 = 2.4 mg/L for rainbow trout). In rats, TBZ is slightly toxic with an oral rat toxicity of LD50 = 3330 mg/kg. TBZ has demonstrated POTW toxicity at slug-loads above 50 mg/L. Human health risks appear to be low, as it is used to treat humans for several helminthes species, such as roundworms and is also used medicinally as a chelating agent to bind metals.

TBZ is stable to photolysis in soil and hydrolysis. It does not metabolize significantly in soils under aerobic or anaerobic conditions. The field half-life for TBZ was reported in one study as 403 days. However, TBZ is readily adsorbed onto soil particles and is practically immobile in soil. Its affinity for soil binding increases with increasing soil acidity. EPA has concluded that due to its affinity for soil and high soil/water partitioning coefficients, the risks for leaching into groundwater and runoff into surface waters are low. TBZ photo-degrades in water with a half life of approximately 29 hours when exposed to a xenon lamp for 96 hours. Given TBZ’s low solubility, it is most likely to be bound to sediment.

Drencher wastewater (no matter what chemicals are used) is not allowed to discharge to POTWs, percolation systems, and surface waters. Discharges to POTWs (with permission) of wastewater containing TBZ (except drencher water) will have a max limit of 50 mg/L and discharges (except drencher water) to percolation systems will have a max limit of 10.0 mg/L (the aquatic toxicity value). Individual POTWs may deny discharge or may set more stringent limits if they feel it is necessary to protect their operations. Any wastewater containing TBZ is prohibited from discharging to surface waters. The most stringent discharge limit for wastewater (drencher and packing water) containing
TBZ for both dust abatement and land application will be the maximum label use rate of 615 mg/L, at an application rate of 1800 gallons/acre/day, every other day, to a maximum 30 applications per year. Ecology will require an annual analysis of this parameter, for the above TDMs.

**SOPP (sodium ortho-phenylphenoxide) (CAS# 132-27-4)**

SOPP is a fungicide commonly used in pear float tanks at concentrations from 1000 to 6000 ppm. It is used primarily with one of the following pear float enhancers: lignosulfonate, sodium sulfate, sodium silicate, and potassium carbonate. It may also be used in a separate in-line dip tank. This chemical has proven to be highly toxic to aquatic organisms (LC50 = 5.99 mg/L for fathead minnow and an LC50 = 2.8 mg/L for rainbow trout). Acute oral rat toxicity studies show an LD50 = 1160 mg/kg, making it slightly toxic to rats. Human health risk has not been determined, but is suspected to be moderate due to the toxicity data for pure phenol, which is chemically similar.

Chlorine should not be used in conjunction with SOPP because the chlorine can destroy the compounds in SOPP and possibly form polychlorobiphenyls (PCBs). The chlorine would not be able to attain a free disinfection residual that would be sufficient to destroy postharvest pathogen spores (*Investigation into Effluent Discharges from Washington Fresh Apple Packers* (EPA Contract No. 68-03-2578), September 1980, 110 pg).

At concentrations lower than 10.0 mg/L, SOPP is easily and rapidly biodegraded, with a half-life of approximately seven days under aerobic conditions in both soil and water. In experiments with activated sludge systems, SOPP has caused upsets at slug loadings of 50 mg/L.

Discharges of wastewater containing SOPP to POTWs will be limited to 50.0 mg/L of SOPP. Individual POTWs may set more stringent limits if they feel it is necessary to protect their operations. Discharges of wastewater containing SOPP to percolation systems will be limited to 6.0 mg/L of SOPP, the LC50 toxicity value. The tiered application rate for land application and dust abatement established in the previous permit remains in effect. Application frequency will be limited to once per week to reduce the risk of the SOPP inhibiting the microbial action needed for its degradation. The maximum SOPP concentration will be set at the normal maximum use concentration of 6000 mg/L for the same reason. These limits are subject to change if additional research becomes available, or if any biological testing or monitoring indicates SOPP concentrations at these levels are not being adequately treated.

**ANTIOXIDANTS**

**Diphenylamine (DPA) (CAS# 122-39-4)**

DPA is a chemical antioxidant that prevents the brown "scald" discoloration of apples, and may be used in combination with TBZ or Ethoxyquin®. It is used in drenching solutions at concentrations of up to 2200 mg/L. In 1997, DPA was approved for re-registration for post harvest use by the EPA. The Re-registration Eligibility Decision (RED) states that DPA appears to be very labile in the environment, with aerobic soil metabolism and aqueous photolysis being important. Under aerobic soil conditions DPA degrades rapidly (half-life < 1 day). When exposed to light in water transformation half-life is 4.39 hours. It undergoes rapid degradation in the presence of ultraviolet (UV) light and air, having a half-life of approximately 30 days in unamended soil. However, humic
substances enhance the degradation process, showing a half-life of approximately 10 days. It appears the ultimate fate of DPA residues is: mineralization and soil binding. Relatively little information is available about the transformation products of DPA under aerobic soil metabolism or aqueous photolytic conditions. DPA readily adsorbs onto soil, exhibiting low mobility and therefore, is not expected to leach. The mobility of DPA ranges from somewhat mobile in clay soil to mobile in other soil types (EPA Re-registration Eligibility Decision (RED), Diphenylamine EPA738-R-97-010).

The RED indicates DPA is moderately toxic to fish (LC50 (96hr) =2.2 for rainbow trout). An Ecology study conducted in 1988 determined DPA product toxicity of LC50 = 2.6 mg/L for rainbow trout. This same study also found that actual drencher wastewaters had an average LC50 = 1315 mg/L for rainbow trout. Oral rat toxicity studies of DPA have shown an LD50 = 3000 mg/kg, which makes it slightly toxic to rats. Human oral studies have shown that the lowest published lethal dose is 500 mg/kg.

DPA has been found to interfere with POTW processes at 10 mg/L and since actual discharges have significantly interfered with POTWs in the past, this TDM is prohibited for use. Wastewater containing DPA is prohibited from discharging to any TDM other than lined lagoons, dust abatement or land application. The most stringent discharge limit for land application will be the maximum normal use concentration of 2200 mg/L. For dust abatement apply DPA-containing waste streams at any rate of up to a maximum annual rate of 990 lbs/acre of road surface or bin lot, which is equivalent to the discharge of 1800 gallons/acre of 2200 mg/L of DPA, 30 times per year, every other day. Ecology will not require an annual analysis of this parameter for the above TDMs, if the permittee complies with all the terms and conditions of this general permit and applies wastewater containing DPA at a maximum rate of 1800 gallons/acre/day, every other day, to a maximum of 30 applications per year. This general permit requires Permittees to maintain records of all drencher water discharges using either the Batch Mix Record form or an equivalent form that records the following information: (1) batch number; (2) date the batch was mixed; (3) person responsible for making the batch; (4) total batch volume; (5) name and amount of all chemicals added to the batch; (6) date spent solution was discharged; (7) disposal site identification; (8) volume of spent solution discharged; (9) disposal area; (10) calculated application rate; and (11) TDM inspection results and comments about any abnormal conditions.

**Ethoxyquin® (CAS# 91-53-2)**

Ethoxyquin® is an antioxidant used to control pear scald. This chemical is typically used at a concentration of approximately 2700 mg/L and should not be used in conjunction with other chemicals. Effects on POTWs and environmental degradation processes are not known. It is slightly toxic to aquatic organisms (LC50 = 18.0 mg/L for Rainbow Trout). Oral rat studies have shown an LD50 = 800 mg/kg, making it slightly toxic to rats as well. Human health risks appear to be moderate, as cases of skin irritation upon contact have been reported. The lowest published lethal dose to humans was 500 mg/kg.

The strictest discharge limit for wastewater (drencher and packing water) containing Ethoxyquin® for both dust abatement and land application will be the maximum normal use concentration of 2700 mg/L, at a max application rate of 1800 gallons/acre/day, every other day, to a maximum 30 applications per year. All drencher wastewater (no matter what chemicals are used) is not allowed to discharge to POTWs, percolation systems, and surface waters. Discharges of wastewater (except drencher wastewater) containing Ethoxyquin® to POTWs will have a max limit of 50 mg/L and
discharges (except drencher wastewater) to percolation systems will have a max limit of 5.0 mg/L. Any wastewater containing Ethoxyquin® is prohibited from discharging to surface waters. Ecology will require an annual analysis of this parameter, for the above TDMs.

**PEAR FLOAT GRAVITY ENHANCERS**

**Potassium Carbonate (CAS# 584-08-7)**

Potassium carbonate is a specific gravity enhancer for pears and is usually used at a starting concentration of 27,000 ppm. It is often used with SOPP in float tank systems. Oral rat toxicity studies for potassium carbonate indicate an LD50 = 1870 mg/kg, making it slightly toxic to rats. With regards to aquatic organisms, potassium carbonate is slightly toxic (LC50 (96hr) = 68 mg/L for rainbow trout and an EC50 (48hr) = 430 mg/L for daphnia magna).

Float tank and rinse wastewater containing potassium carbonate is prohibited from discharging to surface waters. Only rinse wastewater containing potassium carbonate will be allowed to discharge to POTWs. The strictest discharge limit is the maximum normal use concentration of 27,000 mg/L. Untreated wastewaters containing potassium carbonate will most likely be high in pH (11-12) and will therefore need to be reduced to at least a pH of 6.0 to 9.0 either before or after application.

**Potassium Phosphate (CAS# 7320-34-5)**

Potassium phosphate is a specific gravity enhancer for pears and is often used with chlorine in float tank systems. It is typically used at a starting concentration of about 28,800 ppm. Potassium phosphate has an oral rat toxicity of LD50 = > 500 mg/L, making it slightly toxic to rats. No aquatic toxicity information is currently available for potassium phosphate.

Float tank wastewater containing potassium phosphate is prohibited from discharging to any TDM other than lined lagoons and land application. Rinse wastewater containing potassium phosphate will be allowed to discharge to dust abatement, land application, and lined lagoons. The strictest discharge limit for land application and dust abatement is the maximum normal use concentration of 28,800 mg/L.

**Sodium Silicate (CAS# 1344-09-8)**

Sodium silicate is a specific gravity enhancer for pears and is used at a starting concentration of 30,000 ppm. It is considered mildly toxic, with an LC50 = 113 mg/L for daphnia magna. Oral rat toxicity studies indicate an LD50 = 13 mg/kg, making it highly toxic to rats. Sodium silicate has been detrimental to some POTW processes due to its abrasiveness and corrosive nature. However, this same characteristic may have significant road maintenance qualities, making it appropriate for discharges to dust abatement.

Float tank and rinse wastewater containing sodium silicate is prohibited from discharging to any TDM other than a lined lagoon, dust abatement, or land application. The strictest discharge limit for dust abatement and land application will be the maximum normal use concentration of 30,000 mg/L. Untreated wastewaters containing sodium silicate will normally be high in pH (10.0 to 11.0) and will need to be reduced to at least a pH of 9.0 either before or immediately after application.
Sodium Sulfate (CAS# 7757-82-6)

Sodium sulfate is a specific gravity enhancer for pears and is used at a starting concentration of 30,000 ppm. It is practically non-toxic, with an LC50 (48hr) = 1190 mg/L for daphnia magna. The FDA has classified this chemical as an indirect food additive due to being poorly absorbed into the gastrointestinal tract.

Both float tank and rinse wastewater containing sodium sulfate is allowed to discharge to lined lagoons, dust abatement, and land application. Only rinse wastewater containing sodium sulfate is allowed to discharge to POTWs and percolation systems. Both float tank and rinse wastewater containing sodium sulfate is prohibited from discharging into surface waters. The main concern about wastewater containing sodium sulfate is the sulfate component. Even if sodium sulfate is not used, sulfate is a required parameter for discharges to the following TDMs: POTWs (excluding NCCW), land application (excluding NCCW and drencher wastewater), and percolation systems (excluding NCCW). The only time sulfate is a required parameter for discharges to dust abatement is when sodium sulfate is used. Whenever sulfate is a required parameter, the discharge limit is always the same, 250 mg/L, which is the state’s groundwater quality standard. Wastewaters containing sodium sulfate will normally be high in sulfate and may need desulfonation prior to discharge to meet the sulfate effluent limits.

Lignosulfonate (CAS# 8061-51-6)

Lignosulfonate is a specific gravity enhancer used to float pears and stone fruits at the beginning of packing operations. The normal float tank concentration is 12% (120,000 mg/L) lignosulfonate, of which 50% or 60,000 mg/L are solids. The BOD5 to solids ratio is generally 0.3 to 1 resulting in approximately 18,000 mg/L BOD5 in the float tank solution. At these discharge concentrations, lignosulfonate is extremely toxic (LC50 = 2400 mg/L for rainbow trout). However, other process wastewaters downstream of the float tank will typically contain less lignosulfonate and therefore have a reduced potential for impacting the environment. Oral rat toxicity studies indicate an LD50 = 28,500 mg/L. The high BOD5 content of float tank discharges would be potentially detrimental under all TDMs except for dust abatement, since lignosulfonate has a strong affinity to adsorb to soil. The strictest discharge limit for dust abatement will be the normal float tank use concentration of 12% or 120,000 mg/L lignosulfonate. If the permittee complies with all the terms and conditions of this general permit, Ecology will not require analysis of this parameter for the above TDM.

Other lignosulfonate-containing process wastewater discharges (i.e., rinse water) are allowed to be discharged to lined evaporative lagoons, POTWs (which do not use UV disinfection), land application, and dust abatement. Even in rinse water there is a strong potential for effluent limit violations due to lignosulfonate being extremely high in BOD5. Odor control measures may be necessary for discharges to lined lagoons due to the high BOD5 content. In the past, quantities of lignosulfonate wastewater entered POTWs, adversely affecting the operation of the POTWs, either because of the BOD5 exceeding the limits or because of the color interfering with the UV disinfection system and passing through the system untreated. Measures must be taken to ensure that such discharges must not exceed any limit given for any specific TDM or cause any interference or by-pass at a POTW. Such measures can include process and source control methods such as; countercurrent washing systems, pre-rinse bars, collection and return of tank overflow and other runoff to the dump tank, recycling, dry or floatless dump systems, alternative chemicals, or any other new pollutant reduction techniques that
become available. This general permit prohibits the discharge of both float tank water and rinse water containing lignosulfonate to POTWs that use UV disinfection. At such time that scientific evidence would indicate that different limits and/or TDMs would be possible without causing significant potential to violate any state or federal law or standard, this general permit may be modified accordingly.

OTHER CHEMICALS/PROCESSES

**Calcium Chloride (CAS# 10043-52-4)**

Calcium chloride is used to help prevent disorders in fruit that are caused by low calcium levels, such as bitterpit. It is typically used in postharvest drencher solutions at a concentration of approximately 2200 mg/L (equivalent chloride concentration = 1406 mg/L). It can be used with DPA or TBZ. When used in smaller concentrations, it is relatively non-toxic to aquatic organisms (LC50 = 900 mg/L for rainbow trout). Calcium chloride produces heart failure in mice at a concentration of 280 mg/L. Human health risks appear to be moderate in that it is a powerful irritant of the skin and respiratory systems. In Canada, 50 mg/L has been suggested as the drinking water limit for this chemical. In countries where it is used instead of salt for ice melt; there have been reported serious losses of wildlife due to the animals drinking the slush containing concentrated amounts of calcium chloride along roadsides. Calcium chloride is used at concentrations which pose a potential for salt build-up in the soil and eventual leaching to groundwater. This chemical does not biodegrade.

Wastewater containing calcium chloride is prohibited from discharging to any TDM other than lined lagoons, dust abatement, and land application. The best way to control chlorides is through the use of BMPs, including specifying a maximum use concentration and a maximum annual application rate. The maximum use concentration will be the label use rate of 2200 mg/L and the maximum annual application rate for dust abatement and land application will be 1800 gal/acre/day, one (1) time a year. These rates were chosen using a biased model to determine the annual application rate of calcium chloride which could be diluted by dormant seasonal precipitation to coincide with a concentration rate that would be protective of groundwater quality.

One of the main concerns using calcium chloride is its chloride component. Chloride is a secondary groundwater criterion and is set at the Groundwater Quality Standard of 250 mg/L, with the main concern being the aesthetic value of the water. The criterion was set as a drinking water standard at the point where a salty taste could be detected. There is a minimal health risk associated with chloride. Chloride is considered a conservative pollutant in that the only “treatment” it can receive is dilution. For all TDMs besides lined lagoons, permitted facilities are required to sample for chloride in all wastewater except for drencher wastewater and NCCW (even when calcium chloride is not used) at a max rate of 250 mg/L (Groundwater Quality Standard).

**Peroxyacetic Acid (also referred to as Peracetic Acid) (CAS# 79-21-0)**

Peroxyacetic acid is used in postharvest, fruit packing process water to control microbial growth on fruit. It is most often used in dip tanks and packing line spray systems, but can also be used in flume water. For fruit packing purposes, peroxyacetic acid is most often used in a formulation that contains hydrogen peroxide and acetic acid. This formulation is commonly just referred to as peroxyacetic acid or peracetic acid. It is typically used at a concentration between 80-100 mg/L. Agitation or contact
with organics such as apples accelerates the decomposition of peroxyacetic acid. Once decomposition occurs, it degrades rapidly into water, oxygen, and acetic acid.

Due to a lack of ecological and toxicological information, wastewater containing peroxyacetic acid is prohibited from being discharged to any TDM other than lined lagoon, dust abatement, or land application. Under certain circumstances, discharges to a POTW may be allowed, but these discharges must be approved by the POTW and Ecology. Ecology will not require analysis of this parameter for the above TDMs as long as the permittee complies with all the terms and conditions of this general permit. As with all chemicals, spill containment and drain protection devices need to be in place where peroxyacetic acid will be used and/or stored.

**Ultraviolet light (UV)**

Ultraviolet light has been studied as a disinfectant since 1893. It includes light with wavelengths from 150 to 4000 Angstroms, with 2537 Angstroms being the most effective. UV's disinfecting properties are due to its direct reactions with the nucleic acids in an organism's cellular structure. The amount of energy needed to destroy a specific bacterium, fungus, or fungal spore is quite variable. Other factors which limit UV disinfection are: (1) the water medium itself; (2) the amount of turbidity; and (3) the amount of organic matter present. Small-scale projects have shown that UV is easy to install and has the benefit of not producing any toxic residuals or by-products. Given these advantages, the industry should continue to investigate UV technology to determine if advances will make it a viable disinfection option.

**Ozone**

Ozone is a tri-atomic molecule of oxygen (O₃) that is a bluish gas and has been used for disinfecting drinking water since 1893. The effectiveness of ozone is not as dependent on pH and temperature as chlorine, nor does it require extensive contact time. Ozone does not react appreciably with ammonia and produces no known toxic by-products. It has a disinfection potential of, at least, twice that of chlorine. Experiments at the Hood River Experiment Station, Oregon yielded important and positive data about this disinfectant concerning the fruit packing industry. These experiments found that ozone at 0.3 ppm, or chlorine at 54 ppm, in dump (float) tank water controlled Penicillium and Cladosporium to the same levels. An ozone level of 0.5 ppm killed approximately 80% of the spores in an exposure time of three (3) minutes (Spotts RA, "Use of Ozone for Decay Control", Proceedings of the 7th Annual Washington Tree Fruit Postharvest Conference, March 27 and 28, 1991).

**Silicone defoaming agent (organosilicone fluid emulsion)**

This product is used to defoam process water and is typically used up to a maximum of 100 mg/L, which corresponds to the maximum FDA limit of 10.0 mg/L silicone solids. It has a pH between 4 and 5. Human health risks appear to be low as the product used is FDA food grade.

The strictest discharge limit for any application will be the maximum normal use concentration of 100 mg/L. Ecology will not require analysis of this parameter if the permittee complies with all the terms and conditions of this general permit.
Wax (carnauba or shellac) coatings, with/without fungicide additives

Waxes are often applied to give fruit physical protection and an attractive appearance for shipment. Again, these products are spray applied and are assumed to be a minor contributor to overall wastewater discharges and thus not detrimental to any of the TDMs. Human health risk appears to be low, as these are typically food grade additives.

**Bio-Save®**

Bio-Save® fungicides are based on naturally occurring, non-pathogenic, and non-genetically engineered bacterium strains of *Psuedomonas syringae*, CAS# 68583-32-4, which is also their active ingredient. It is generally applied to apples and pears in drencher solutions in order to help control blue mold, gray mold, and mucor rot. When used on apples and pears, it can be used in conjunction with DPA. For use with cherries, it is applied via overhead drip or spray systems and helps control blue mold and gray mold. This application results in minimal discharge, basically only during clean-up. Bio-Save® fungicides have an oral rat toxicity of LD50 = >5000 mg/kg. No information is currently available for aquatic toxicity. Once mixed for application, Bio-Save® fungicides have a shelf life of 24 to 48 hours. It is killed on contact with sanitation cleaners such as bleach and quaternary ammonium compounds.

Evidence suggests Bio-Save® controls fruit infection by out-competing the pathogen for nutrients at the wound site on fruit surfaces. There is no evidence of significant antibiotic production. It has received registration by EPA and is exempted from all residue tolerance levels granted by EPA. According to the Codex Committee on Pesticide Residues, Bio-Save® does not represent a health concern and has no requirement of MRLs (maximum limits for pesticide residues) (an information packet received 10-30-98 from Lucie Grant, Director of Technical Operations, EcoScience, PO Box 3228, Orlando, Florida, 32802. (407) 872-2224). Ecology will not require analysis of this parameter if the permittee complies with all the terms and conditions of this general permit. Ecology will continue to work with the manufacturer to track development and use of these products. Should additional information indicate these types of products pose a significant risk to water quality; this general permit may be modified to include additional monitoring, BMPs, or effluent limits.

**PACKING LINE CHEMICALS**

Packing lines vary between fruit packing houses in the type and quantity of both chemical additives used and wastewater discharged. The fresh fruit packing industry typically uses linear alkyl sulfonate (LAS) based detergent washes to remove natural waxes, dirt, and other orchard residues from the fruit prior to further processing. Additional acidic or basic apple wash additives such as acetic acid, phosphoric acid, sodium hydroxide, trisodium phosphate, sodium carbonate, etc., may be used to remove hard water deposits (calcium/magnesium carbonate) which can result from overhead irrigation.

After washing, apples are rinsed with copious amounts of clean fresh water prior to entering the dehumidifier, waxes, and dryer. Red apples are typically given an application of either a shellac or carnauba-based wax, which may also contain small concentrations of a fungicide to prevent bacterial action. Packing line and cleanup wastewaters primarily contain detergents, disinfectants, and wax removing products in concentrations that appear compatible with all the allowed TDMs.
The type and frequency of packing line chemicals used vary among the packing houses. Each packer uses only those chemicals that are most effective through past experience. The chemicals are typically applied by a spray and are considered to be a minor component of the total wastewater flow discharged from the fresh fruit packing lines. The discharge of wastewater containing packing line chemicals is allowed to any TDM except surface water. Discharges of wastewater containing only LAS-based soaps, waxes, and acidic or basic washes may be discharged to surface water only after having received a minimum of secondary treatment. For this permit secondary treatment is defined as aerated biological treatment followed by filtration or sedimentation and pH adjustment, if needed. There is extensive literature showing LAS-based materials readily undergo primary and ultimate biodegradation under a wide variety of wastewater treatment processes and that LAS does not accumulate in river water or sediments. No additional monitoring of these chemicals beyond that required of all surface water discharges is required, except watching for foaming at the outfall during regular inspections. The discharge limit for each packing line chemical is the normal label use rate. For increased efficiency, High Pressure Low Volume (HPLV) spray-head technology should be considered for use on spray systems.

CONDITIONAL USE OF CHEMICALS NOT SPECIFICALLY LISTED IN THE PERMIT

This general permit allows for the conditional use of products/chemicals not normally allowed if certain procedures are first followed. The products must be approved for a specific use by the EPA and/or the Washington State Department of Agriculture (WSDA). The products must also undergo a risk assessment process that must be approved by Ecology. For more information regarding the conditional use of chemicals, please refer to Special Condition S9 in the permit.

TREATMENT/DISPOSAL METHODS (TDMs)

SELECTION OF TDMS

Ecology has studied the characteristics of wastewater discharges from the fresh fruit packing industry. The TDMs discussed below were designed for the protection of the waters of the state, POTWs, and human health and must not conflict with any stricter existing zoning, land use, and/or local health department regulations. This general permit requires the permittee to identify all of the waste streams to be discharged by the facility. The permittee must then select for each waste stream, the appropriate TDM based upon the chemicals contained in the waste stream (see Table 2).

A fresh fruit packing facility may use any of the following six allowed TDMs, as appropriate:

1. Lined Evaporative Lagoons
2. Dust Abatement
3. Publicly Owned Treatment Works (POTW)
4. Land Application
5. Percolation Systems
6. Surface Waters
### TABLE 2 - SELECTION OF TREATMENT/DISPOSAL METHODS (TDMS)

<table>
<thead>
<tr>
<th>WASTE-WATER SOURCE</th>
<th>CHEMICALS USED</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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</thead>
<tbody>
<tr>
<td><strong>DRENCHER OR DIP TANK</strong></td>
<td>LIGNOSULFONATE WITH OR WITHOUT SOPP</td>
<td><strong>FLOT</strong></td>
<td><strong>YES</strong></td>
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<td></td>
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<td></td>
<td>POTASSIUM CARBONATE WITH OR WITHOUT SOPP</td>
<td><strong>FLOT</strong></td>
<td><strong>YES</strong></td>
<td><strong>YES</strong></td>
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<tr>
<td></td>
<td>POTASSIUM PHOSPHATE WITH OR WITHOUT CHLORINE</td>
<td><strong>FLOT</strong></td>
<td><strong>YES</strong></td>
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<tr>
<td></td>
<td>SODIUM SILICATE WITH OR WITHOUT CHLORINE OR SOPP</td>
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<tr>
<td></td>
<td>SODIUM SULFATE WITH OR WITHOUT CHLORINE OR SOPP</td>
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<td></td>
<td>FLOATLESS DUMPER WITH SOPP</td>
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<tr>
<td></td>
<td>FLOATLESS DUMPER WITH ONLY CHLORINE OR NO FUNGICIDES</td>
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<td><strong>PEAR PACKING</strong></td>
<td>NO PRIORITY POLLUTANTS, DANGEROUS WASTES, OR TOXICS IN TOXIC AMOUNTS</td>
<td><strong>YES</strong></td>
<td><strong>YES</strong></td>
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<td><strong>NCCW</strong></td>
<td>NO PRIORITY POLLUTANTS, DANGEROUS WASTES, OR TOXICS IN TOXIC AMOUNTS</td>
<td><strong>YES</strong></td>
<td><strong>YES</strong></td>
<td><strong>YES</strong></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

1. Wastewater (except drencher wastewater) containing Ethoxyquin® is allowed to discharge to POTWs (w/permission) at a max limit of 50 mg/L and to percolation systems at a max limit of 5.0 mg/L.
2. Pretreatment for wastewater containing Penbotec® does exist, see page 26 for more information.
3. Wastewater containing soap and/or wax must receive at least secondary treatment prior to discharge to surface water.
4. TBZ is allowed to discharge to POTWs (w/permission) at a max limit of 50 mg/L and to percolation systems at a max limit of 10.0 mg/L.
5. Wastewater containing lignosulfonate cannot be discharged to POTWs with UV disinfection.
6. pH adjustment may be needed before discharge.
7. Pretreatment may be needed to meet sulfate limits.
8. Discharge of NCCW to a POTW is allowed only under extraordinary circumstances and requires the approval of both the POTW and Ecology.
TREATMENT/DISPOSAL METHODS (TDMs) SPECIFICATIONS

The following specifications apply to all TDMs.

SAMPLE TYPE AND FREQUENCY

Fruit packers must collect representative composite samples with the exception of measurements for pH, total residual chlorine, and temperature, which must be done on grab samples immediately after collection. Monitoring will be done in any quarter in which there is a discharge. Monitoring frequency will be quarterly for all wastewater discharges except: (1) TBZ and Ethoxyquin® concentrations in drencher wastewater must be done annually; and (2) all non-NCCW discharges to surface waters, must be done monthly. Ecology may establish specific monitoring requirements in addition to those contained in this general permit by administrative order.

INSPECTION OF TDMs

The permittee must make regular inspections of all TDMs at a frequency to ensure their proper operation. For dust abatement, land application, and percolation systems this inspection must take place at the time of discharge. Any abnormalities must be recorded along with a description of any actions taken in order to correct the problem. Examples of such abnormalities include, but are not limited to:

- High liquid levels
- Rapid changes in lagoon liquid levels
- Holes or deterioration in a liner
- Washouts or berm damage
- Overflows
- Abnormal odors, colors, or foaming
- Ponding, runoff, or overland flow
- Abnormal crop growth
- Soil or water quality deterioration
- Sediment build-up, changes in biota, etc.

Discovery of any significant abnormality is cause for taking immediate corrective action and must be reported to Ecology within 48 hours of discovery, along with a description of the corrective action taken or planned.
MINIMUM SETBACKS

TABLE 3 - Minimum Setbacks

<table>
<thead>
<tr>
<th>IMPOUNDMENT TYPE</th>
<th>Minimum Setback Distance (Feet) to:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Surface waters of the state,</td>
</tr>
<tr>
<td></td>
<td>irrigation supply ditches,</td>
</tr>
<tr>
<td></td>
<td>drainage ditches, wetlands, etc.</td>
</tr>
<tr>
<td>Lined lagoons with DPA</td>
<td>250</td>
</tr>
<tr>
<td>Lined lagoons without DPA</td>
<td>50</td>
</tr>
<tr>
<td>APPLICATION SITE</td>
<td>Potable water supply well¹</td>
</tr>
<tr>
<td>Dust abatement, land application, and</td>
<td>250</td>
</tr>
<tr>
<td>percolation systems</td>
<td>100</td>
</tr>
</tbody>
</table>

¹The setbacks to potable water supply wells were determined using BPJ and chapter 173-160-205 WAC, which states that wells must be located at least 100 feet from known or suspected contamination sources. No impoundments or wastewater applications are allowed within Wellhead Protection Areas. Contact the Washington State Department of Health for more information on the Wellhead Protection Program. All impoundments including lined evaporative lagoons, sedimentation ponds, and storage lagoons must meet the requirements specified in this general permit for lined evaporative lagoons.

TDM 1 - LINED EVAPORATIVE LAGOONS

Lined evaporative lagoons (lined lagoons) are imperviously lined, engineered structures that rely largely upon evaporation for water removal. These structures can be in-ground lined lagoons or pre-manufactured, above-ground fiberglass or metal tanks. For the purposes of this general permit, lined lagoons constructed between July 1, 2004 and July 1, 2009 must be constructed with a geomembrane liner that meets or exceeds the performance specifications of a 40 mil High Density Polyethylene (HDPE) geomembrane liner. For lagoons constructed after July 1, 2009, packers must use a 60 mil HDPE geomembrane liner.

Ecology may require in certain situations, the use of a geomembrane liner with higher specifications and/or double-layered liners. For the purposes of this general permit, clay liners are not acceptable. Ecology has determined that clay and amended soil liners are less desirable than geomembrane liners due to extreme dependency on liner compositional characteristics and construction methods; a slight mistake may allow substantial percolation. Geomembrane liners are composed of man-made materials such as thermoplastics (i.e., polyvinyl chloride [PVC]), crystalline thermoplastics (i.e., HDPE), elastomers (i.e., butyl rubber), and thermoplastic elastomers (i.e., Hypalon). These liners are typically non-reactive to chemicals in wastewater, however some types will lose plasticizer (degrade) when exposed to ultraviolet (UV) light. HDPE is very UV resistant, while PVC is significantly less resistant.

BEST MANAGEMENT PRACTICES (BMPS) FOR LINED EVAPORATIVE LAGOONS

Pollutant/parameters are limited by full compliance with the following required BMPs. The permit does not require chemical testing for these discharges to lined lagoons. Packers must:

- Locate, design, and manage all impoundments to control odors and insects.
- Not mix drencher wastewater with any other waste streams that contain chlorine-based chemicals.
- Maintain a minimum of two feet of freeboard at all times.
• Make regular inspections of the lagoon at a frequency sufficient to monitor proper operation.
• Complete weekly inspections while discharging.
• Maintain inspection records describing abnormalities and any actions taken to correct the problem(s). Examples of such abnormalities include, but are not limited to, high liquid levels, rapid changes in liquid levels, holes, washouts, liner deterioration, overflows, etc.
• Take immediate corrective actions and report to Ecology within 48 hours of the discovery of any significant abnormality.
• Completely empty the lagoon and examine the liner at least every five years. If substantial deterioration is found, the liner must be replaced or repaired. Results of the inspection must be reported in the Application for Renewal of Coverage.
• Treat and dispose of any sludge or solid wastes produced during any sedimentation process in accordance with the terms of the Solid Waste Management Plan (SWMP) in the permittee’s Environmental Compliance Plan (ECP). The packer must comply with all state and county health department regulations.
• Ensure that a state licensed engineer manages the design and construction of any impoundment unless Ecology waives this requirement in accordance with chapter 173-240 WAC.
• Obtain a dam safety permit if the above-ground storage capacity exceeds ten acre-feet.
• The lagoon must meet the following requirements:

1. The liner must be constructed of a geomembrane material that is specifically engineered to withstand internal and external pressure gradients, physical contact with wastes, climatic conditions, and stresses of installation and daily operation. The lagoon liner must be a geomembrane liner that meets or exceeds the performance specifications of a 40 mil HDPE geomembrane liner for lagoons constructed between July 1, 2004 and July 1, 2009 or 60 mil HDPE for lagoons constructed after July 1, 2009.
2. Have a continuous liner covering the entire liner bottom and sides of the structure that are likely to be in contact with wastewater.
3. Be placed on a base of sand or similar material thick enough to prevent failure due to settlement, compression, stretching, or uplift.
4. Prevent the movement of wastewater chemicals through its structure to waters of the state, or to contact any adjacent ground or soil.
5. Have a life expectancy which must extend at a minimum, through the entire length of this general permit (five years).
6. Be surrounded by a minimum six foot high fence with a locked gate.

ALTERNATIVES TO GEOMEMBRANE LINED LAGOON

The permittee may alternatively use a warrantable, above ground, pre-manufactured fiberglass, fiberglass-lined, or metal tank in lieu of the geomembrane lined lagoon. In this case, the permittee will be required to comply fully with all the above-listed BMPs and prohibitions, except for items 1-3 listed above.

RATIONALE FOR LINED LAGOONS

The general permit does not normally include requirements for analyzing waste streams discharged to a lined lagoon. Discharge limits are the maximum normal use concentrations and discharge volumes
must not exceed the two-foot freeboard daily minimum monitoring limit. However, sampling must be conducted on any lagoon discharge including, but not limited to, over-topping or leakage. Ecology anticipates that if packers properly implement all the above BMPs, this TDM should adequately protect groundwater.

**TDM 2 - DUST ABATEMENT**

Dust abatement is the application of wastewater to unpaved bin storage lots and unpaved roads (i.e., dirt orchard roads) for the purpose of dust suppression. This TDM is intended primarily for the discharge of drencher wastewater and pear float tank wastewater containing lignosulfonate, sodium sulfate, sodium silicate, or potassium carbonate. Wastewaters containing sodium sulfate may require desulfonation prior to discharge to meet the total sulfate effluent limit. Wastewaters containing sodium silicate and potassium carbonate may require neutralization prior to discharge to meet the pH effluent limit (6.0 to 9.0). The permit only allows dust abatement is only allowed on unpaved roadways or unpaved bin storage lots. Each facility desiring to use this TDM must prepare a Road Management Plan (RMP). Any waste streams containing DPA, lignosulfonate, or chlorine-based chemicals must have separate application sites and RMPs. The permittee’s RMP must not allow for potential or actual contamination of waters of the state, or violate any other federal, state, or local regulation.
APPLICATION RATES AND FREQUENCIES

- Discharges must not exceed those specific numerical limits and application rates given in Tables 4, 5, 6, or 7;

**TABLE 4 - Application Rates, Frequencies, and Allowed Sites for Dust Abatement**

<table>
<thead>
<tr>
<th>WASTE STREAM DESCRIPTION</th>
<th>MAXIMUM APPLICATION RATE</th>
<th>FREQUENCY⁴</th>
<th>ALLOWED SITES</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANY PERMITTED WASTE STREAM EXCEPT DRENCHER WASTEWATER, PEAR FLOAT WASTEWATER, AND WASTEWATER CONTAINING PENBOTEC® OR SCHOLAR®</td>
<td>1800 gallons/acre/day</td>
<td>180 times/year every day</td>
<td>Only unpaved bin lots or unpaved roads</td>
</tr>
<tr>
<td>ANY DRENCHER WASTEWATER Not containing calcium chloride</td>
<td>1800 gallons/acre/day</td>
<td>30 applications/year every other day</td>
<td></td>
</tr>
<tr>
<td>Containing calcium chloride</td>
<td>1800 gallons/acre/year</td>
<td>one (1) application/year</td>
<td></td>
</tr>
<tr>
<td>ANY WASTEWATER CONTAINING PENBOTEC® Penbotec® concentration (mg/L) of:</td>
<td>1800 gallons/acre/year</td>
<td>30 applications/year every other day</td>
<td></td>
</tr>
<tr>
<td>0 to 500</td>
<td>1800 gallons/acre/year</td>
<td>15 applications/year every other day</td>
<td></td>
</tr>
<tr>
<td>500 to 1000</td>
<td>1800 gallons/acre/year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greater than 1000</td>
<td>Discharge not allowed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANY WASTEWATER CONTAINING SCHOLAR® Maximum concentration of 300 mg/L</td>
<td>1800 gallons/acre/day</td>
<td>30 applications/year every other day</td>
<td></td>
</tr>
<tr>
<td>PEAR FLOAT TANK WASTEWATER² (excluding that with potassium phosphate) With an SOPP (or other fungicide) concentration, in mg/L, of:</td>
<td>0 to 1000</td>
<td>4840 gal/acre/day</td>
<td>once per week</td>
</tr>
<tr>
<td></td>
<td>1001 to 2000</td>
<td>2420 gal/acre/day</td>
<td>once per week</td>
</tr>
<tr>
<td></td>
<td>2001 to 3000</td>
<td>1613 gal/acre/day</td>
<td>once per week</td>
</tr>
<tr>
<td></td>
<td>3001 to 4000</td>
<td>1210 gal/acre/day</td>
<td>once per week</td>
</tr>
<tr>
<td></td>
<td>4001 to 5000</td>
<td>968 gal/acre/day</td>
<td>once per week</td>
</tr>
<tr>
<td></td>
<td>5001 to 6000</td>
<td>807 gal/acre/day</td>
<td>once per week</td>
</tr>
<tr>
<td></td>
<td>Greater than 6000</td>
<td>Discharge not allowed</td>
<td></td>
</tr>
</tbody>
</table>

¹ Application rates are valid only if chemical additives concentrations are in compliance with the maximum label use rates specified in Table 6. ² The only pear float tank specific gravity enhancers allowed in wastewater that is discharged to dust abatement are; lignosulfonate, sodium sulfate, sodium silicate, and potassium carbonate. Only rinse wastewater containing potassium phosphate is allowed to be discharged via dust abatement.

² Application rates are valid only if chemical additives concentrations are in compliance with the maximum label use rates specified in Table 6. ² The only pear float tank specific gravity enhancers allowed in wastewater that is discharged to dust abatement are; lignosulfonate, sodium sulfate, sodium silicate, and potassium carbonate. Only rinse wastewater containing potassium phosphate is allowed to be discharged via dust abatement.
TABLE 5 - Effluent Limits and Monitoring for All Wastewater Discharges to Dust Abatement

<table>
<thead>
<tr>
<th>POLLUTANT/PARAMETER AND UNITS</th>
<th>DAILY MAXIMUM LIMIT</th>
<th>SAMPLE FREQUENCY</th>
<th>SAMPLE TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DRENCHER WATER ONLY¹</td>
<td>NCCW ONLY</td>
<td>ALL OTHER ALLOWED WASTEWATER SOURCES</td>
</tr>
<tr>
<td>Analysis is required for all of the following parameters except those marked NR (Not Required)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow (gallons/day)</td>
<td>record value</td>
<td>record value</td>
<td>record value</td>
</tr>
<tr>
<td>pH (standard units)</td>
<td>NR</td>
<td>6.0 – 9.0</td>
<td>6.0 – 9.0</td>
</tr>
<tr>
<td>Total chloride (mg/L)</td>
<td>NR</td>
<td>NR</td>
<td>250</td>
</tr>
<tr>
<td>Total dissolved solids (TDS) (mg/L)</td>
<td>NR</td>
<td>record value</td>
<td>NR</td>
</tr>
<tr>
<td>Analysis is required for all of the following parameters except: (1) those marked NR or (2) if that chemical is not used at the facility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total residual chlorine (mg/L)²</td>
<td>10.0</td>
<td>10.0</td>
<td>10.0</td>
</tr>
<tr>
<td>Total sulfate³ (mg/L)</td>
<td>NR</td>
<td>NR</td>
<td>250</td>
</tr>
<tr>
<td>Captan® (mg/L)</td>
<td>10.0</td>
<td>NR</td>
<td>10.0</td>
</tr>
<tr>
<td>Dichloran® (mg/L)</td>
<td>10.0</td>
<td>NR</td>
<td>10.0</td>
</tr>
<tr>
<td>Ethoxyquin® (mg/L)</td>
<td>2700</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>TBZ (mg/L)</td>
<td>615</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>SOPP (mg/L)</td>
<td>NR</td>
<td>NR</td>
<td>see Table 4</td>
</tr>
<tr>
<td>Penbotec®⁴ (mg/L)</td>
<td>see Table 4</td>
<td>NR</td>
<td>see Table 4</td>
</tr>
<tr>
<td>Scholar® (mg/L)</td>
<td>300</td>
<td>NR</td>
<td>300</td>
</tr>
</tbody>
</table>

¹ Effluent limits and monitoring are valid only if all chemical additive concentrations and application rates are in compliance with those specified in Tables 4 and 6. ² Required test only if any chlorine-based chemicals are used (i.e., sodium hypochlorite, chlorine dioxide). ³ Required test only if sodium sulfate is used. ⁴ Pretreatment for wastewater containing Penbotec® does exist, see page 21 of this fact sheet for more information.

TABLE 6 - Chemical Additive Maximum Use Rates

<table>
<thead>
<tr>
<th>CHEMICAL USE</th>
<th>CHEMICAL ADDITIVE</th>
<th>MAXIMUM USE RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pear float enhancers</td>
<td>lignosulfonate</td>
<td>120,000 mg/L or 12% solids</td>
</tr>
<tr>
<td></td>
<td>sodium sulfate</td>
<td>30,000 mg/L or 3% solids</td>
</tr>
<tr>
<td></td>
<td>sodium silicate</td>
<td>30,000 mg/L or 3% solids</td>
</tr>
<tr>
<td></td>
<td>potassium carbonate</td>
<td>27,000 mg/L</td>
</tr>
<tr>
<td>Drencher additives and other chemicals</td>
<td>DPA</td>
<td>2200 mg/L</td>
</tr>
<tr>
<td></td>
<td>TBZ</td>
<td>615 mg/L</td>
</tr>
<tr>
<td></td>
<td>Ethoxyquin®</td>
<td>2700 mg/L</td>
</tr>
<tr>
<td></td>
<td>calcium chloride</td>
<td>2200 mg/L</td>
</tr>
<tr>
<td></td>
<td>Penbotec®</td>
<td>See Table 4</td>
</tr>
<tr>
<td></td>
<td>Scholar®</td>
<td>300 mg/L</td>
</tr>
<tr>
<td>Pear Fungicide</td>
<td>SOPP</td>
<td>6000 mg/L - see Table 4</td>
</tr>
</tbody>
</table>
TABLE 7 - Required Soil and Groundwater Monitoring for Dust Abatement Discharges Containing Lignosulfonate

<table>
<thead>
<tr>
<th>Application Frequency</th>
<th>Additional Required Monitoring</th>
<th>Testing Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>once every 30 or more days</td>
<td>None</td>
<td>N/A</td>
</tr>
<tr>
<td>once every 14 to 29 days</td>
<td>Test subsoil with dipyridyl for the presence of Fe$^{2+}$ ions at 12-inch depth within the lowest part of the application site where ponding may occur.</td>
<td>Quarterly</td>
</tr>
<tr>
<td>once every 7 to 13 days</td>
<td>Install a down gradient monitoring well to test groundwater for BOD$_5$ and, with dipyridyl, for the presence of Fe$^{2+}$ ions.</td>
<td>Monthly</td>
</tr>
</tbody>
</table>

- Maximum use rate of lignosulfonate is 12% solids or 120,000 mg/L
- Maximum application rate is 4840 gal/acre
- Maximum application frequency is no more than once every 7 days

BEST MANAGEMENT PRACTICES (BMPS) FOR DUST ABATEMENT

Packers must comply with the following BMPs when using dust abatement to dispose of wastewater.

- Do not commingle or apply to the same site any waste stream containing:
  
  1. DPA
  2. Lignosulfonate
  3. Chlorine-based chemicals

- Utilize an application system that provides even distribution of the wastewater over the application area at the specified application rates and frequencies.
- Maintain accurate and ongoing records to verify that the facility uses chemical additives at or below the use rate concentrations specified in Table 6 and to ensure that the application of wastewater to each site complies with the required application rates, BMPs, and other permit conditions.
- Keep the following information for Batch Mix Records:

  1. Batch ID number
  2. Date batch was mixed
  3. Person responsible for mix
  4. Total batch volume (gallons)
  5. Name and amount of all chemicals added to batch
  6. Date spent solution was discharged
  7. Volume of spent solution discharged (gallons)
  8. Application Site Identification (ASI) (used to track application to prevent over application of improper mixing of wastewater
  9. Actual application area (acres)
  10. Application rate (gallons/acre)
  11. Inspection results and comments regarding any abnormal conditions such as ponding, runoff, overland flow, etc. (see page 33, “Inspection of TDMs”)


• Do not commingle process waste streams with sanitary (domestic) sewage
• Do not discharge in excess of the specific numerical limits and application rates given in Tables 4, 5, 6 and 7
• Do not discharge priority pollutants, dangerous wastes, or toxics in toxic amounts
• Do not apply at a rate which results in ponding or runoff
• Do not apply to sites where the groundwater table is located within five (5) feet of the soil surface at time of application
• Do not apply to sites that are frozen, snow-covered, saturated, flooded, or when anaerobic conditions exist
• Provide sufficient self-contained storage capacity for all wastewaters during any time period when application cannot be properly achieved (i.e., when application site is saturated, flooded, or frozen). This self-contained storage must meet the requirements of the lined lagoon TDM
• Treat and dispose of any sludge or solid waste produced during any sedimentation process in accordance with the terms of the Solid Waste Management Plan (SWMP) in the permittee's Environmental Compliance Plan (ECP) and in compliance with all state and county health department regulations
• Do not apply to sites within wellhead protection boundaries

ROAD MANAGEMENT PLAN (RMP)

Prior to any discharge and for each separate dust abatement application site, a packer must develop and retain on-site an RMP. The following waste streams must have separate application sites and RMPs: (1) wastewater containing lignosulfonate; (2) wastewater containing DPA; and (3) wastewater with chlorine-based chemicals. Each RMP must, at a minimum, include:

• A copy of proof of ownership of the application site, or a legally binding written agreement with the legal owner to use the site for wastewater treatment and disposal
• An application site description including, at a minimum:
  1. The location of the application site
  2. A map indicating the site boundaries
  3. A brief description of the geology and topography of the site and its immediately surrounding areas indicating its suitability as an application site
  4. The surface material and composition of the site (i.e., dirt road or gravel bin lot)
  5. The total surface area of the application site

• An operational plan including, at a minimum:
  1. The proposed total maximum daily and annual application rates expressed as gallons/acre/day and gallons/acre/year
  2. The maximum use concentration of the active ingredient(s) (i.e., DPA, Ethoxyquin®, calcium chloride, lignosulfonate, etc.)
  3. The proposed application schedule and operational methodology to be followed throughout the duration of this general permit
RATIONALE FOR DUST ABATEMENT EFFLUENT LIMITS AND APPLICATION RATE LIMITS

Ecology used Best Professional Judgment (BPJ) to determine permit requirements for the following parameters. Packers should control usage of the chemical additives with in-house procedures.

1. **BOD$_5$:** The permit does not require monitoring for BOD$_5$ for wastewater discharges to dust abatement. Other than those containing lignosulfonate, most discharges to dust abatement typically have BOD$_5$ concentrations of less than 500 mg/L. This, combined with the maximum daily application rate of 1800 gallons/acre, results in BOD$_5$ loadings of less than 7.5 lbs/acre/day, which should protect groundwater. Ecology determined that BOD$_5$ from pear float solutions containing lignosulfonate is best controlled using proper solution preparation, application rates, and BMPs. Lignosulfonate solutions must not exceed the normal use rate of 12% (120,000 mg/L), of which 50% or 60,000 mg/L are solids. With a BOD$_5$ to solids ratio of 0.3 to 1, this results in a maximum BOD$_5$ limit of 18,000 mg/L.

The permit requires that packers do not exceed the following two application rates: a maximum annual rate of 67.6 tons of lignosulfonate solids/acre, and a maximum daily rate of 1.3 tons of lignosulfonate solids/acre. Ecology determined that this limit will protect the groundwater based on the following manufacturers' recommendations: (1) suggested maximum application rate of 50 tons of lignosulfonate solids/acre; and (2) dust abatement application rate 1.3 tons of lignosulfonate solids/acre. This dust abatement daily application rate of 1.3 tons solids/acre, when using the normal use concentration of 6% solids (60,000 mg/L), calculates to approximately 1.0 gallons/square yard or 4840 gallons/acre. This is in line with the manufactures' recommendation for dust abatement application of 0.25 gallon per square yard of a 25% solids solution. Ecology chose application frequency intervals that should allow enough time for biological degradation to occur. Ecology chose application intervals (see Table 4, Pear Float Tank) that would result in application rates approximating the one time application of 60 tons of solids per acre that was reported to pose no threat of groundwater contamination (ITT Rayonier Inc., *Environmental Effects of Applying Lignosulfonate to Roads*, Rayonier Chemical Products Update, May 1989). Additional required soil and groundwater monitoring for the higher frequencies are specified in Table 8.

### TABLE 8 – Dust Abatement Application Frequencies and Monitoring for Wastewater Containing Lignosulfonate

<table>
<thead>
<tr>
<th>IF THE ANNUAL APPLICATION RATE IS (TONS OF SOLIDS/ACRE)</th>
<th>WHICH IS EQUIVALENT TO</th>
<th>ADDITIONAL REQUIRED MONITORING</th>
<th>AT THIS MONITORING FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 TO 15.6</td>
<td>Applying 4840 gal/acre of 12% lignosulfonate wastewater once every 30 days</td>
<td>None</td>
<td>N/A</td>
</tr>
<tr>
<td>&gt; 15.6 to 33.8</td>
<td>Applying 4840 gal/acre of 12% lignosulfonate wastewater once every 14 days</td>
<td>Test subsoil with dipyridyl at 12-inch depth within the lowest part of the application site where ponding may occur for the presence of Fe$^{2+}$ ions.</td>
<td>Quarterly</td>
</tr>
<tr>
<td>&gt; 33.8 to 67.6</td>
<td>Applying 4840 gal/acre of 12% lignosulfonate wastewater once every 7 days</td>
<td>Install a down gradient monitoring well to test groundwater for BOD$_5$ and with dipyridyl for the presence of Fe$^{2+}$ ions.</td>
<td>Monthly</td>
</tr>
</tbody>
</table>
Packers must determine which of the preceding three annual application rates it will use to apply any lignosulfonate wastewater to the dust abatement site at the facility. They must record the application rate and results of all required soil and groundwater monitoring. Ecology must approve any groundwater monitoring site prior to any installation of a groundwater monitoring well. Both maximum limits will remain in force for the life of this general permit unless scientific evidence becomes available indicating that Ecology may allow a different limit. Ecology may then modify this general permit accordingly.

2. **Captan® or Dichloran®**: The permit includes a discharge limit equal to the dangerous waste regulations calculated maximum concentration of 10.0 mg/L for application of these chemicals for dust abatement.

3. **Scholar®**: The discharge limit for wastewater containing Scholar® applied for dust abatement is equal to its maximum normal use concentration of 300 mg/L. The maximum application rate is 1800 gallons/acre/day, every other day, with a maximum of 30 applications per year to a single application site. If used, Ecology will require quarterly analysis of this parameter for discharges to dust abatement.

4. **Penbotec®**: Wastewater containing Penbotec® is prohibited from discharging to any TDM other than a lined lagoon, dust abatement, or land application. This general permit will allow Penbotec® to have two different discharge limits. When used at a maximum concentration of 500 mg/L, its discharge limit will be 500 mg/L, with an application rate limit of 1800 gallons/acre/day, every other day, with a maximum of 30 applications per year to a single application site. When used at a concentration exceeding 500 mg/L, but under the maximum concentration of 1000 mg/L, its discharge limit will be 1000 mg/L, with an application rate limit of 1800 gallons/acre/day, every other day, with a maximum of 15 applications per year to a single application site. If used, Ecology will require quarterly analysis of this parameter for each of the above mentioned TDMs.

5. **DPA**: The discharge limit will be equal to the maximum normal use concentration of 2200 mg/L. BPJ suggests a maximum daily application rate of 1800 gallons/acre, every other day, with a maximum of 30 applications per year to a single site. This is equivalent to an annual application rate of 990 lbs of DPA/acre. The maximum annual and daily rates were derived using data collected by Gray & Osborne, Inc. during a soil column study in late 1993. These maximum rates and frequencies will remain in force for the life of this general permit unless scientific evidence becomes available indicating that a different limit may be allowed. This general permit may then be modified accordingly.

This general permit will not require an analysis of this parameter, for this TDM, if the permittee complies with all the terms and conditions of this general permit and applies this wastewater at an application rate of no more than 1800 gallons/acre/day, every other day, with a maximum of 30 applications per year. The permittee must maintain records of all drencher water discharges using either the **Batch Mix Record** form or an equivalent. See page 40 of this fact sheet for further details concerning Batch Mix Records.

6. **Ethoxyquin®**: The permit includes a discharge limit equal to the maximum normal use concentration of 2700 mg/L, every other day, with a maximum of 30 applications per year to a
7. **pH:** Ecology placed the technology-based effluent limits for pH in the permit. Packers must maintain pH in the range of 6.0 to 9.0.

8. **Sodium Silicate:** The permit includes a discharge limit equal to the maximum normal use concentration of 30,000 mg/L. Analysis of this parameter will not be required for this TDM if the permittee complies with all the terms and conditions of this general permit. Any application rate (not concentration) that does not produce runoff or ponding will be permitted. However, these waste streams will need to be reduced to an acceptable pH range (6.0 to 9.0) prior to application.

9. **Potassium Carbonate:** The permit includes a discharge limit equal to the maximum normal use concentration of 27,000 mg/L. Analysis of this parameter will not be required for this TDM if the permittee complies with all the terms and conditions of this general permit. Any application rate (not concentration) which does not produce runoff or ponding will be permitted. These waste streams may need to be neutralized to an acceptable pH range (6.0 to 9.0) prior to application.

10. **SOPP:** The discharge limit will be equal to the dangerous waste regulations calculated maximum concentration of 6000 mg/L. The formula for calculating application rates for SOPP concentrations greater than 1000 mg/l is:

    \[
    \text{APPLICATION RATE} = \frac{4840 \text{ gal/ac}}{\text{Actual SOPP concentration}} \times 1000 \text{ mg/l}
    \]

11. **TBZ:** The discharge limit will be the maximum normal drencher use concentration of 615 mg/L, every other day, 30 applications per year to a single application site. If the permittee complies with all the terms and conditions of this general permit, the only required analysis for TBZ-containing drencher wastewater will be an annual verification of the chemical additive concentrations. The permittee must record, for each batch, the same information as required for drencher wastewater containing DPA.

12. **Total chloride:** The discharge limit will be 250 mg/L, the state's groundwater quality standard, for wastewater which does not contain calcium chloride. For wastewater discharges containing calcium chloride, analysis of this parameter will not be required for this TDM, if the permittee complies with all the terms and conditions of this general permit. This includes the use of calcium chloride at concentrations no greater than the label rate of 2200 mg/L and a one-time maximum annual application rate of 1800 gallons/acre. See the discussion of calcium chloride in the “Chemicals Used” section of this fact sheet for more details on the derivation of these use and application limits.
13. **Total Residual Chlorine (TRC):** The discharge limit will be equal to the dangerous waste regulations calculated maximum concentration of 10.0 mg/L. This parameter does not need to be sampled for under this TDM if no chlorine-based chemicals are used.

**TDM 3 - POTW (PUBLICLY OWNED TREATMENT WORKS)**

A POTW is a municipal or regional wastewater treatment plant.

Wastewater discharged to a POTW must comply with special BMPs and prohibitions that Ecology expects will protect all POTWs. Slug loads of pollutants may potentially disrupt or upset municipal treatment systems. Ecology has documented past instances of POTW upsets directly attributable to the fresh fruit packing industry.

The effluent limits, monitoring, and BMPs contained in this general permit may be modified by any stricter conditions imposed by a POTW. Compliance with the terms of this general permit does not relieve the permittee from the responsibility to comply with any contract or agreement with the POTW or for responsibility for any contamination, pass-through, or upset of a POTW related to the discharge of any facility wastewater.

In addition to other BMPs, dischargers to a POTW must:

- Obtain written certification from the receiving POTW accepting the facility’s wastewater. The certification is contained in the Application for Coverage
- Comply fully with all applicable pretreatment standards including, but not limited to, the following:
  1. General Pretreatment Regulations 40 CFR part 403
  2. Any stricter local municipal sewer use ordinance
  3. Any stricter local health district regulations
- Not discharge in excess of those specific numerical limits given in Table 9 of this fact sheet
- Not discharge priority pollutants, dangerous wastes, toxics in toxic amounts, or any other wastewater which is prohibited, toxic, or otherwise detrimental to sewage treatment facilities or processes
### TABLE 9 - Effluent Limits and Monitoring for All Discharges to POTWs

<table>
<thead>
<tr>
<th>POLLUTANT/PARAMETER AND UNITS</th>
<th>DAILY MAXIMUM LIMIT</th>
<th>ALLOWED WASTEWATER EXCEPT NCCW</th>
<th>NCCW ONLY¹</th>
<th>SAMPLE FREQUENCY</th>
<th>SAMPLE TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis is required for all of the following parameters except those marked NR (Not Required)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow (gallons/day)</td>
<td>record value</td>
<td>record value</td>
<td>1/discharge event</td>
<td>Measurement</td>
<td></td>
</tr>
<tr>
<td>BOD₅ (mg/L)</td>
<td>500</td>
<td>NR</td>
<td>Quarterly</td>
<td>Composite</td>
<td></td>
</tr>
<tr>
<td>pH (standard units)</td>
<td>6.0 – 9.0</td>
<td>NR</td>
<td>Quarterly</td>
<td>Composite</td>
<td></td>
</tr>
<tr>
<td>Total chloride (mg/L)</td>
<td>250</td>
<td>NR</td>
<td>Quarterly</td>
<td>Composite</td>
<td></td>
</tr>
<tr>
<td>Total sulfate (mg/L)</td>
<td>250</td>
<td>NR</td>
<td>Quarterly</td>
<td>Composite</td>
<td></td>
</tr>
<tr>
<td>Total suspended solids (TSS) (mg/L)</td>
<td>500</td>
<td>NR</td>
<td>Quarterly</td>
<td>Composite</td>
<td></td>
</tr>
</tbody>
</table>

Analysis is required for all of the following parameters except: (1) those marked NR or (2) if that chemical is not used at the facility

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Limit</th>
<th>Frequency</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total residual chlorine² (mg/L)</td>
<td>0.5</td>
<td>Quarterly</td>
<td>Grab</td>
</tr>
<tr>
<td>Ethoxyquin® (mg/L)</td>
<td>50</td>
<td>Quarterly</td>
<td>Composite</td>
</tr>
<tr>
<td>SOPP (mg/L)</td>
<td>50</td>
<td>Quarterly</td>
<td>Composite</td>
</tr>
<tr>
<td>TBZ (mg/L)</td>
<td>50</td>
<td>Quarterly</td>
<td>Composite</td>
</tr>
</tbody>
</table>

¹ Discharge of NCCW to a POTW is allowed only under extraordinary circumstances and requires the approval of both Ecology and the POTW. ² Required test only if any chlorine-based chemicals are used (i.e., sodium hypochlorite)

### RATIONALE FOR POTW DISCHARGE POLLUTANT LIMITATIONS

Ecology used Best Professional Judgment (BPJ) to determine permit requirements for the following parameters. Packers should control usage of the chemical additives with in-house procedures.

1. **BOD₅**: The permit includes a discharge limit of 500 mg/L for dischargers to POTWs. This represents a limit approximately twice as great as typical average domestic sewage (250 mg/L BOD₅). Domestic sewage BOD₅ concentrations have reached 500 mg/L with no substantial disruption of POTW activities. This limit should adequately protect POTWs from slug load disruption.

2. **Ethoxyquin®**: The discharge limit will be 50 mg/L, which takes into consideration the toxicity of Ethoxyquin®.

3. **pH**: Ecology placed the technology-based effluent limits for pH in the permit. Packers must maintain pH in the range of 6.0 to 9.0.

4. **SOPP**: The discharge limit will be 50 mg/L, which takes into consideration its toxicity.

5. **TBZ**: The discharge limit will be 50 mg/L, which takes into specific consideration the toxicity of TBZ.

6. **Total chloride**: The discharge limit will be 250 mg/L, the state's groundwater quality standard.

7. **Total Residual Chlorine (TRC)**: The discharge limit will be 0.50 mg/L, which takes into specific consideration the toxicity of chlorine.
8. **Total sulfate:** The discharge limit will be 250 mg/L, the state's groundwater quality standard, which takes into specific consideration the protection of the waters of the state and that no substantial treatment would occur in the POTW.

9. **Total Suspended Solids (TSS):** The permit includes a discharge limit of 500 mg/L. This represents a limit approximately twice as great as typical average domestic sewage (250 mg/L of TSS). Domestic sewage TSS concentrations have reached this quantity with no substantial disruption of POTW activities. This limit should adequately protect POTWs from slug load disruption.

10. **Potassium Carbonate:** The permit allows packers to discharge rinse wastewater containing potassium carbonate to POTWs. Wastewater containing potassium carbonate may need to be neutralized to an acceptable pH range (6.0 to 9.0) prior to discharge.

**TDM 4 - LAND APPLICATION**

Land application uses an engineered system for applying wastewater to a vegetated land surface. The applied wastewater is treated by chemical, biological, and physical processes as it flows through the plant-soil matrix. The system consists of the vegetated land application site, a distribution system such as sprinklers for evenly distributing the wastewater, and a lined lagoon (or other Ecology-approved, storage system) for storing wastewater during periods when it cannot be land applied (i.e., frozen ground). It is comparable to the slow rate land treatment process as described in the *EPA Process Design Manual and Supplement for the Land Treatment of Municipal Wastewater* (EPA 625/1-81-013 and –013a). The above design manual and other relevant Ecology-approved documents, (i.e., *Guidelines for Preparation of Engineering Reports for Industrial Wastewater Land Application Systems*, Department of Ecology Publication #93-36) provide appropriate guidance for designing land application systems.

Sprinkler (sprayfield) systems are generally the most appropriate land application systems for wastewaters from the fruit packing industry. Other methods may be used, if they provide adequate distribution of the wastewater. A successful land application scheme will achieve a level of wastewater treatment that will not result in violations of groundwater or surface water quality standards. Ecology has determined that land application satisfies the AKART requirement only after satisfactorily complying with all of the BMPs and prohibitions listed below.

- **Do not** commingle or apply to the same site any waste stream containing the following:
  1. DPA
  2. Lignosulfonate
  3. Chlorine-based chemicals

- Utilize an application system which provides even distribution of the wastewater over the application area at the specified application rates and frequencies.
- Apply DPA-containing waste streams only to non-irrigated non-crop lands at any rate up to a maximum annual rate of 990 lbs/acre (the discharge of 1800 gallons/acre of 2200 mg/l of DPA, 30 times per year). The use of non-irrigated non-crop lands prevents the DPA from washing down into the ground before degradation by the UV light from the sun.
• Apply DPA-containing waste streams only to unirrigated non-crop lands and at any rate up to a maximum daily rate of 1800 gallons/acre.
• Maintain accurate and ongoing records for batch applications to verify that chemical additives are being used at or below the use rate concentrations specified in Table 12 of the permit and to ensure that the application of wastewater to each site is in compliance with the required application rates, BMPs, and other permit conditions.
• Keep the following information for all Batch Mix Records:

  1. Batch ID Number
  2. Date batch was mixed
  3. Person responsible for mix
  4. Total batch volume (gallons)
  5. Name and amount of all chemicals added to batch
  6. Date spent solution was discharged
  7. Disposal Site Identification (used to track application to prevent over application or improper mixing of wastewater)
  8. Volume of spent solution discharged (gallons)
  9. Disposal area (acres)
 10. Application rate (gallons/acre)
 11. Inspection results and comments regarding any abnormal conditions such as ponding, runoff, overland flow, etc. (see Section 5. Inspections)

• Do not commingle process waste streams with sanitary (domestic) sewage.
• Do not discharge priority pollutants, dangerous wastes, or toxics in toxic amounts.
• Do not apply at a rate which results in ponding or runoff.
• Do not apply wastewater at rates with will exceed the published agronomic rates for the crop being applied to.
• If needed, properly install, operate, and maintain a lined sedimentation pond or other Ecology-approved device designed to pretreat the wastewater in order to prevent violations of the TSS effluent limit and prevent plugging of the wastewater distribution system.
• Do not apply wastewater at sites where the groundwater table is located within ten (10) feet.
• Do not apply to sites which are frozen, snow-covered, saturated, flooded, etc.
• Provide sufficient self-contained storage capacity for all wastewaters during any time period when application cannot be properly achieved (i.e., when application site is saturated, flooded, or frozen). This self-contained storage must meet the requirements of the lined lagoon TDM.
• Treat and dispose of any sludge or solid waste produced during any sedimentation process in accordance with the terms of the SWMP in the permittee's ECP and in compliance with all state and county health department regulations.
• Do not apply to sites within wellhead protection boundaries.
• Prohibit livestock from grazing on the application site.
• Maintain onsite, a copy of proof of ownership of the application site, or a written agreement with the legal owner to use the site for wastewater treatment/disposal.
• Do not discharge in excess of those specific limits and application rates given in Tables 10, 11, and 12.
### TABLE 10 - Application Rates, Frequencies, and Allowed Sites for Land Application

<table>
<thead>
<tr>
<th>WASTE STREAM DESCRIPTION</th>
<th>MAXIMUM APPLICATION RATE</th>
<th>FREQUENCY</th>
<th>ALLOWED SITES</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANY DRENCHER WASTEWATER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not containing calcium chloride</td>
<td>1800 gal/acre/day</td>
<td>30 applications/year every other day</td>
<td></td>
</tr>
<tr>
<td>Containing calcium chloride</td>
<td>1800 gal/acre/year</td>
<td>1 application per year</td>
<td></td>
</tr>
<tr>
<td>PEAR FLOAT TANK WASTEWATER(^2) (excluding that with lignosulfonate) with an SOPP (or other fungicide) concentration, in mg/L of:</td>
<td></td>
<td></td>
<td>Only un-irrigated, non-crop land</td>
</tr>
<tr>
<td>0 to 1000</td>
<td>4840 gal/ac/day</td>
<td>once per week</td>
<td></td>
</tr>
<tr>
<td>1001 to 2000</td>
<td>2420 gal/ac/day</td>
<td>once per week</td>
<td></td>
</tr>
<tr>
<td>2001 to 3000</td>
<td>1613 gal/ac/day</td>
<td>once per week</td>
<td></td>
</tr>
<tr>
<td>3001 to 4000</td>
<td>1210 gal/ac/day</td>
<td>once per week</td>
<td></td>
</tr>
<tr>
<td>4001 to 5000</td>
<td>968 gal/ac/day</td>
<td>once per week</td>
<td></td>
</tr>
<tr>
<td>5001 to 6000</td>
<td>807 gal/ac/day</td>
<td>once per week</td>
<td></td>
</tr>
<tr>
<td>greater than 6000</td>
<td></td>
<td></td>
<td>Discharge Not Allowed</td>
</tr>
<tr>
<td>ANY WASTEWATER CONTAINING PENBOTEC(^\circ)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Penbotec(^\circ) concentration (mg/L) of:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 500</td>
<td>1800 gallons/acre/day</td>
<td>30 applications/year every other day</td>
<td></td>
</tr>
<tr>
<td>500 to 1000</td>
<td>1800 gallons/acre/day</td>
<td>15 applications/year every other day</td>
<td></td>
</tr>
<tr>
<td>greater than 1000</td>
<td></td>
<td></td>
<td>Discharge Not Allowed</td>
</tr>
<tr>
<td>ANY WASTEWATER CONTAINING SCHOLAR(^\circ)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Used at a maximum concentration of: 300 mg/L</td>
<td>1800 gallons/acre/day</td>
<td>30 applications/year every other day</td>
<td></td>
</tr>
<tr>
<td>greater than 600</td>
<td></td>
<td></td>
<td>Discharge Not Allowed</td>
</tr>
<tr>
<td>ANY OTHER PERMITTED WASTE STREAM (see table 2) with BOD(_5) or TSS levels, in mg/L, of:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 200</td>
<td>6000 gal/acre/day</td>
<td>every other day</td>
<td>any suitable land application site</td>
</tr>
<tr>
<td>201 to 400</td>
<td>3000 gal/acre/day</td>
<td>every other day</td>
<td></td>
</tr>
<tr>
<td>401 to 600</td>
<td>2000 gal/acre/day</td>
<td>every other day</td>
<td></td>
</tr>
<tr>
<td>greater than 600</td>
<td></td>
<td></td>
<td>Discharge Not Allowed</td>
</tr>
</tbody>
</table>

\(^1\) Application rates are valid only if chemical additives concentrations are in compliance with the maximum use rates specified in Table 12. Discharge of wastewater containing concentrations greater than those specified in Table 12 is not allowed. \(^2\) The only pear float chemicals allowed in wastewater discharged to land application are sodium sulfate, sodium silicate, potassium carbonate, and potassium phosphate. Only rinse wastewater containing lignosulfonate is allowed to be discharged via land application.
### TABLE 11 - Effluent Limits and Monitoring for All Discharges to Land Application

<table>
<thead>
<tr>
<th>POLLUTANT/PARAMETER AND UNITS</th>
<th>DAILY MAXIMUM LIMIT</th>
<th>SAMPLE FREQUENCY</th>
<th>SAMPLE TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DRENCHER WATER ONLY¹</td>
<td>NCCW ONLY</td>
<td>ALL OTHER ALLOWED WASTEWATER SOURCES</td>
</tr>
<tr>
<td>Analysis is required for all the following parameters except those marked NR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow (gallons/day)</td>
<td>record value</td>
<td>record value</td>
<td>record value</td>
</tr>
<tr>
<td>BOD₅ (mg/L)</td>
<td>NR</td>
<td>NR</td>
<td>see Table 10</td>
</tr>
<tr>
<td>pH (standard units)</td>
<td>NR</td>
<td>6.0 – 9.0</td>
<td>6.0 – 9.0</td>
</tr>
<tr>
<td>Total chloride (mg/L)</td>
<td>NR</td>
<td>NR</td>
<td>250</td>
</tr>
<tr>
<td>Total sulfate (mg/L)</td>
<td>NR</td>
<td>NR</td>
<td>250</td>
</tr>
<tr>
<td>TDS (mg/L)</td>
<td>NR</td>
<td>record value</td>
<td>500</td>
</tr>
<tr>
<td>TSS (mg/L)</td>
<td>NR</td>
<td>NR</td>
<td>see Table 10</td>
</tr>
</tbody>
</table>

Analysis is required for the following parameters except (1) those marked NR or (2) if that chemical is not used at the facility:

- Total residual chlorine (mg/L)²
- Captan® (mg/L)
- Dichloran® (mg/L)
- Ethoxyquin® (mg/L)
- TBZ (mg/L)
- SOPP (mg/L)
- Penbotec®³ (mg/L)
- Scholar® (mg/L)

¹ Effluent limits and monitoring valid only if all chemical additive concentrations and application rates are in compliance with those specified in Tables 10 and 12. ² Required test only if any chlorine-based chemicals are used (i.e., sodium hypochlorite). ³ Pretreatment for wastewater containing Penbotec® does exist, see page 21 for more information.

### TABLE 12 - Chemical Additive Maximum Use Rates

<table>
<thead>
<tr>
<th>CHEMICAL USE</th>
<th>CHEMICAL ADDITIVE</th>
<th>MAXIMUM USE RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pear float enhancers</td>
<td>sodium sulfate</td>
<td>30,000 mg/L or 3% solids</td>
</tr>
<tr>
<td></td>
<td>sodium silicate</td>
<td>30,000 mg/L or 3% solids</td>
</tr>
<tr>
<td></td>
<td>potassium carbonate</td>
<td>27,000 mg/L</td>
</tr>
<tr>
<td></td>
<td>potassium phosphate</td>
<td>28,800 mg/L</td>
</tr>
<tr>
<td>Drencher additives and other chemicals</td>
<td>DPA</td>
<td>2200 mg/L</td>
</tr>
<tr>
<td></td>
<td>TBZ</td>
<td>615 mg/L</td>
</tr>
<tr>
<td></td>
<td>Ethoxyquin®</td>
<td>2700 mg/L</td>
</tr>
<tr>
<td></td>
<td>calcium chloride</td>
<td>2200 mg/L</td>
</tr>
<tr>
<td></td>
<td>Penbotec®</td>
<td>See Table 10</td>
</tr>
<tr>
<td></td>
<td>Scholar®</td>
<td>300 mg/L</td>
</tr>
<tr>
<td>Pear Fungicide</td>
<td>SOPP</td>
<td>6000 mg/L – see Table 10</td>
</tr>
</tbody>
</table>
RATIONALE FOR LAND APPLICATION EFFLUENT LIMITS AND APPLICATION RATE LIMITATIONS

Ecology used BPJ to determine permit requirements for the following parameters and waste streams. Packers should control usage of the chemical additives within house procedures.

1. **Permitted waste streams, excluding DPA-containing waste streams:** The permit allows packers to discharge daily and annual volume not to exceed the published agronomic flow rate for the crop species or orchard land receiving the application.

2. **DPA-containing waste streams:** The permit only allows packers to apply DPA-containing waste streams to non-irrigated non-crop lands, as suggested by the Washington State Department of Agriculture (WDOA). The permit includes a discharge limit equal to the maximum normal use concentration of 2200 mg/L. It also includes a maximum daily application rate of 1800 gallons/acre/day, every other day, with a maximum of 30 applications per year to a single site. This is equivalent to an annual application rate of 990 lbs of DPA/acre. The maximum annual and daily rates were derived using data collected by Gray & Osborne, Inc. during a soil column study in late 1993. These maximum rates and frequencies must remain in force for the life of this general permit unless scientific evidence becomes available indicating that a different limit may be allowed.

Ecology will not require an analysis of this parameter for this TDM, if the permittee complies with all the terms and conditions of this general permit and applies this wastewater at an application rate of 1800 gallons/acre/day, every other day, 30 times per year. The permittee must maintain records of all drencher water discharges using either the Batch Mix Record form or an equivalent. See page 40 of this fact sheet for further details.

3. **BOD₅:** The permit controls BOD₅ through the use of a tiered maximum daily application rate schedule based upon the actual BOD₅ concentration in the wastewater. Based upon experience with fruit juice processor wastewater discharges to sprayfields, Ecology determined that 10 lbs/acre/day of soluble BOD₅ is a reasonable maximum loading rate. Using this loading rate and the following formula, Ecology calculated a tiered application rate schedule.

Volumetric Application Rate (V) = Mass Loading Rate (M) / Concentration (C)

\[ V = \frac{M}{C} \]

Where:
- \( V \) = Maximum Daily Volumetric Application Rate in gallons/acre/day
- \( M \) = Target BOD₅ Mass Loading Rate of 10 lbs/acre/day
- \( C \) = Measured BOD₅ concentration in the wastewater in mg/L

Example: For wastewater with a BOD₅ of 200 mg/L

Maximum Daily Application Rate = \( \frac{(10 \text{ lbs/ac/day}) \times (453.6 \text{ grgm/lb}) \times (1000 \text{ mg/grgm}) \times (0.264 \text{ gal/L})}{(200 \text{ mg/L})} \)

= 5987.5 gallons/acre/day

\( \approx 6000 \text{ gal/ac/day} \)
Assuming 200 days of application per year, the maximum annual application rate will be 1,200,000 gallons/acre/year, which is equivalent to 44.2 inches/year. This is within the range of published agronomic irrigation rates for orchards and pasture.

3. **Captan® or Dichloran®**: The permit includes a discharge limit equal to the dangerous waste regulations calculated maximum concentration of 10.0 mg/L.

4. **Scholar®**: The discharge limit for wastewater containing Scholar® is equal to its maximum normal use concentration of 300 mg/L. The maximum application rate is 1800 gallons/acre/day, every other day, with a maximum of 30 applications per year to a single application site. If used, Ecology will require quarterly analysis of this parameter for each of the above mentioned TDMs.

5. **Penbotec®**: Within the designated TDMs, this general permit will allow Penbotec® to have two different discharge limits. When used at a maximum concentration of 500 mg/L, its discharge limit will be 500 mg/L, with an application rate of 1800 gallons/acre/day, every other day, with a maximum of 30 applications per year to a single application site. When used at a concentration exceeding 500 mg/L its discharge limit will be 1000 mg/L, with an application rate of 1800 gallons/acre/day, every other day, with a maximum of 15 applications per year to a single application site. If used, Ecology will require quarterly analysis of this parameter for each of the above mentioned TDMs.

6. **Ethoxyquin®**: The discharge limit will be equal to the maximum normal use concentration of 2700 mg/L, every other day, with a maximum of 30 applications per year to a single application site. If the permittee complies with all the terms and conditions of this general permit, the only required analysis for Ethoxyquin®-containing drencher wastewater will be an annual verification of the chemical additive concentrations. The permittee must record, for each batch, the same information as required for drencher wastewater containing DPA.

7. **pH**: Ecology placed the technology-based effluent limits for pH in the permit. Packers must maintain pH in the range of 6.0 to 9.0.

8. **Sodium Silicate**: The discharge limit will be equal to the maximum normal use concentration of 30,000 mg/L. Analysis of this parameter will not be required for this TDM, if the permittee complies with all the terms and conditions of this general permit.

9. **Potassium Carbonate**: The discharge limit will be equal to the maximum normal use concentration of 27,000 mg/L. Analysis of this parameter will not be required for this TDM, if the permittee complies with all the terms and conditions of this general permit. Any application rate (not concentration) that does not produce runoff or ponding will be permitted. However, these waste streams may need to be adjusted to an acceptable pH range (6.0 to 9.0) prior to application.

10. **Potassium Phosphate**: The discharge limit will be equal to the maximum normal use concentration of 28,800 mg/L. Analysis of this parameter will not be required for this TDM, if the permittee complies with all the terms and conditions of this general permit. Any application rate (not concentration) that does not produce runoff or ponding will be permitted.
However, these waste streams may need to be adjusted to an acceptable pH range (6.0 to 9.0) prior to application.

7. **SOPP**: The discharge limit will be equal to the dangerous waste regulations calculated maximum concentration of 1,000 mg/L. The formula for calculating application rates for SOPP concentrations greater than 1000 mg/l is:

\[
\text{APPLICATION RATE} = 4840 \text{ gal/ac} \times \frac{\text{Actual SOPP concentration}}{1000 \text{ mg/l}}
\]

8. **TBZ**: The discharge limit will be equal to the maximum normal drencher use concentration of 615 mg/L, every other day, with a maximum of 30 applications per year to a single application site. If the permittee complies with all the terms and conditions of this general permit, the only required analysis for TBZ-containing drencher wastewater will be an annual verification of the chemical additive concentrations. The permittee must record, for each batch, the same information as required for drencher wastewater containing DPA.

9. **Total chloride**: The discharge limit will be 250 mg/L, the state's groundwater quality standard, for wastewater which does not contain calcium chloride. For wastewater discharges containing calcium chloride, analysis of this parameter will not be required for this TDM, if the permittee complies with all the terms and conditions of this general permit. This includes the use of calcium chloride at concentrations no greater than the label rate of 2200 mg/L and at maximum annual application rate of 1800 gallons per acre. See the discussion of calcium chloride in the “Chemicals Used” section of this fact sheet for more details on the derivation of these use and application limits.

10. **Total Dissolved Solids (TDS)**: The permit includes a discharge limit of 500 mg/L, which takes into specific consideration the lack of degradation in soil and the protection of the waters of the state. Packers must measure TDS in the wastewater on a quarterly basis when discharging via land application.

11. **Total Residual Chlorine (TRC)**: The discharge limit is equal to the dangerous waste regulations calculated maximum concentration of 10.0 mg/L.

12. **Total sulfate**: The discharge limit will be 250 mg/L, which takes into specific consideration the probable lack of degradation in soil and the protection of the waters of the state.

13. **Total Suspended Solids (TSS)**: The permit includes limits for TSS at the same tiered application rates as for BOD$_5$. Ecology believes the same justification applies for TSS as for BOD$_5$. See the description in the BOD$_5$ section.
TDM 5 - PERCOLATION SYSTEMS

A percolation system is an engineered system for aerobic treatment of wastewater as it percolates through the soil matrix. The system is designed to account for hydraulic and nutrient loading rates, wet and dry cycles, even wastewater distribution, and other relevant design parameters. It is analogous to the rapid infiltration land treatment process in the *EPA Process Design Manual and Supplement for the Land Treatment of Municipal Wastewater* (EPA 625/1-81-013 and –013a). This design manual or other Ecology approved documents provide appropriate guidance for designing land application systems.

Ecology will strictly review plans to discharge wastewaters to percolation systems before permitting. Ecology is required by law to protect the state's groundwater; therefore Ecology may require groundwater monitoring and an individual permit at percolation sites, if it suspects the potential for contamination.

For this TDM, the permittee must:

- Utilize an application system that provides even distribution of the wastewater over the application area.
- Properly install, operate, and maintain groundwater monitoring wells and apply for an individual permit if Ecology suspects or detects any groundwater contamination.
- If needed, properly install, operate and maintain a lined sedimentation pond or other Ecology-approved treatment, designed to pretreat the wastewater to prevent violation of the TSS effluent limit and prevent plugging of the percolation system.
- Ensure that any sludge or solid waste produced during any sedimentation process be treated and disposed of in accordance with the terms of the Solid Waste Management Plan (SWMP) in the permittee's Environmental Compliance Plan (ECP). Treatment and disposal must comply with all state and county health department regulations.
- **Not** discharge priority pollutants, dangerous wastes, or toxics in toxic amounts.
- **Not** apply to sites where the groundwater table is located within ten (10) feet from the soil surface.
- **Not** build impoundments or apply to sites less than fifty (50) feet from surface waters of the state, wetlands, or irrigation supply ditches.
- **Not** build impoundments or apply to sites less than one-hundred (100) feet from potable water wells.
- **Not** apply to sites within wellhead protection boundaries.
- **Not** discharge in excess of those specific numerical limits given in Table 13.
TABLE 13 - Effluent Limits and Monitoring for All Discharges to Percolation Systems

<table>
<thead>
<tr>
<th>POLLUTANT/PARAMETER AND UNITS</th>
<th>DAILY MAXIMUM LIMIT</th>
<th>ALLOWED WASTEWATER EXCEPT NCCW</th>
<th>NCCW ONLY</th>
<th>SAMPLE FREQUENCY</th>
<th>SAMPLE TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis is required for all of the following parameters except those marked NR (Not Required)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow (gallons/day)</td>
<td>record value</td>
<td>record value</td>
<td>1/discharge event</td>
<td>Measurement</td>
<td></td>
</tr>
<tr>
<td>BOD₅ (mg/L)</td>
<td>100</td>
<td>NR</td>
<td>Quarterly</td>
<td>Composite</td>
<td></td>
</tr>
<tr>
<td>pH (standard units)</td>
<td>6.0 – 9.0</td>
<td>6.0 – 9.0</td>
<td>Quarterly</td>
<td>Grab</td>
<td></td>
</tr>
<tr>
<td>Total chloride (mg/L)</td>
<td>250</td>
<td>NR</td>
<td>Quarterly</td>
<td>Composite</td>
<td></td>
</tr>
<tr>
<td>Total sulfate (mg/L)</td>
<td>250</td>
<td>NR</td>
<td>Quarterly</td>
<td>Composite</td>
<td></td>
</tr>
<tr>
<td>TDS (mg/L)</td>
<td>500</td>
<td>record value</td>
<td>Quarterly</td>
<td>Composite</td>
<td></td>
</tr>
<tr>
<td>TSS (mg/L)</td>
<td>100</td>
<td>NR</td>
<td>Quarterly</td>
<td>Composite</td>
<td></td>
</tr>
</tbody>
</table>

Analysis is required for all of the following parameters except: (1) those marked NR or (2) if that chemical is not used at the facility

<table>
<thead>
<tr>
<th>Pollutant/Parameter and Units</th>
<th>Daily Maximum Limit</th>
<th>NCCW Only</th>
<th>Sample Frequency</th>
<th>Sample Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total residual chlorine¹ (mg/L)</td>
<td>5.0</td>
<td>5.0</td>
<td>Quarterly</td>
<td>Grab</td>
</tr>
<tr>
<td>Ethoxyquin® (mg/L)</td>
<td>5.0</td>
<td>NR</td>
<td>Quarterly</td>
<td>Composite</td>
</tr>
<tr>
<td>SOPP (mg/L)</td>
<td>6.0</td>
<td>NR</td>
<td>Quarterly</td>
<td>Composite</td>
</tr>
<tr>
<td>TBZ (mg/L)</td>
<td>10.0</td>
<td>NR</td>
<td>Quarterly</td>
<td>Composite</td>
</tr>
</tbody>
</table>

¹ Required test only if any chlorine-based chemicals are used (i.e., sodium hypochlorite, chlorine dioxide)

RATIONALE FOR PERCOLATION SYSTEMS EFFLUENT LIMITS AND APPLICATION RATE LIMITATIONS

Ecology used BPJ to determine permit requirements for the following parameters. Packers should control usage of the chemical additives with in-house procedures.

1. **BOD₅**: The permit includes a discharge limit of 100 mg/L. This represents a 50% reduction (safety margin) of the most conservative limit as indicated in *Guidelines for Preparation of Engineering Reports for Industrial Wastewater Land Application Systems*, Department of Ecology Publication #93-36).

2. **Ethoxyquin®**: The discharge limit will be equal to 5.0 mg/L, which takes into specific consideration both the toxicity of Ethoxyquin® and the protection of the waters of the state.

3. **pH**: Ecology placed the technology-based effluent limits for pH in the permit. Packers must maintain pH in the range of 6.0 to 9.0.

4. **SOPP**: The discharge limit will be equal to 6.0 mg/L, which takes into special consideration both the toxicity of SOPP and the protection of the waters of the state.

5. **TBZ**: The discharge limit will be 10.0 mg/L, which takes into specific consideration both the toxicity of TBZ and the protection of the waters of the state.

6. **Total chloride**: The discharge limit will be 250 mg/L, which takes into specific consideration the protection of the waters of the state.
7. **Total Dissolved Solids (TDS):** The discharge limit will be 500 mg/L for non-NCCW discharges, which takes into specific consideration the protection of the waters of the state.

8. **Total Residual Chlorine (TRC):** The discharge limit will be 5.0 mg/L, which takes into specific consideration both the protection of the waters of the state and its degradation characteristics.

9. **Total sulfate:** The discharge limit will be 250 mg/L, which takes into special consideration the protection of the waters of the state.

10. **Total Suspended Solids (TSS):** The permit includes a discharge limit equal to 100 mg/L. This represents a 50% reduction (safety margin) of the most conservative limit as indicated in *Guidelines for Preparation of Engineering Reports for Industrial Wastewater Land Application Systems*, Department of Ecology Publication #93-36). This is intended to compensate for the higher probability of leaching and thus groundwater contamination, than from land application.

11. **Potassium Carbonate:** The discharge limit will be equal to the maximum normal use concentration of 27,000 mg/L. Analysis of this parameter will not be required for this TDM, if the permittee complies with all the terms and conditions of this general permit. Any application rate (not concentration) which does not produce runoff or ponding will be permitted. However, these waste streams may need to be adjusted to an acceptable pH range (6.0 to 9.0) prior to application.

**TDM 6 - SURFACE WATERS**

Discharges to surface waters include, but are not limited to, lakes, rivers, ponds, streams, inland waters, irrigation canals and return drains, salt waters, wetlands, stormwater or other collection systems that discharge to a surface water, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

**SETTING EFFLUENT LIMITS**

Federal and state regulations require that Ecology set either technology-based or water quality-based effluent limits in a NPDES permit. Ecology derives technology-based limits from federal regulations based on treatment methods available to treat specific pollutants or develops them on a case-by-case basis (40 CFR 125.3, and chapter 173-220 WAC). Water quality-based limits are based upon compliance with the Surface Water Quality Standards (chapter 173-201A WAC), Groundwater Standards (chapter 173-200 WAC), Sediment Quality Standards (chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992). Ecology must choose the more stringent of these two limits for each of the parameters of concern.

Numerical water quality criteria are published in the Water Quality Standards for Surface Waters (chapter 173-201A WAC). They specify the levels of pollutants allowed in receiving water to protect aquatic life and recreation in and on the water. Ecology uses numerical criteria along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limits, the discharge must meet the water quality-based limits.
Chapter 173-201A WAC was designed to protect existing water quality and preserve the beneficial uses of Washington surface waters. Waste discharge permits must include conditions that ensure the discharge will meet established surface water quality standards (chapter 173-201A-510 WAC).

Fruit packing wastewater discharges must, at a minimum, comply with chapter 173-201A WAC. Industry discharges to state surface waters must not contain or have concentrations of deleterious materials. If no numerical limit for any non-conventional pollutant can be found in chapter 173-201A WAC, there will not be allowed any detectable effluent concentration of that contaminant. Ecology has determined that the major discharge contaminant problems facing the state's surface waters from the fresh fruit packing industry typically relate to BOD₅, temperature, pH, TSS, aesthetic values, and/or toxic and deleterious materials.

**MIXING ZONE**

This general permit does not authorize a mixing or dilution zone to the facilities covered under this permit for any discharges to surface waters.

**ANTIDEGRADATION OF SURFACE WATERS**

The purpose of Washington's Antidegradation Policy (chapter 173-201A-300 WAC) is to:

- Restore and maintain the highest possible quality of the surface waters of Washington.
- Describe situations under which water quality may be lowered from its current condition.
- Apply to human activities that are likely to have an impact on the water quality of surface water.
- Ensure that all human activities likely to contribute to a lowering of water quality, at a minimum, apply all known, available, and reasonable methods of prevention, control, and treatment (AKART).
- Apply three Tiers of protection (described below) for surface waters of the state.

Tier I ensures existing and designated uses are maintained and protected and applies to all waters and all sources of pollutions. Tier II ensures that waters of a higher quality than the criteria assigned are not degraded unless such lowering of water quality is necessary and in the overriding public interest. Tier II applies only to a specific list of polluting activities. Tier III prevents the degradation of waters formally listed as "outstanding resource waters," and applies to all sources of pollution.

AntidegradationTier 2 requires Ecology to prohibit new or expanded actions expected to cause a measurable change in water quality unless it determines that the lowering of water quality is necessary and in the overriding public interest. New or expanded facilities covered under individual NPDES permits must conduct a Tier II analysis when their discharge has the potential to cause a measurable change in the physical, chemical, or biological quality of a waterbody. Individual activities covered under general permits or programs do not require a Tier II analysis.

The water quality standards of chapter 173-201A-320 (6) WAC describe how Ecology should conduct an antidegradation Tier II analysis when it reissues NPDES general permits. This section of the rule requires Ecology to:
• Use the information we collect as a result of the permit cycle to revise future permits or program requirements.
• Review and refine management and control programs in cycles not to exceed five years or the period of permit reissuance.
• Include a plan that describes how Ecology will obtain and use information to ensure full compliance with water quality standards. Ecology must develop and document the plan in advance of permit or program approval.

Prior to discharging wastewater from their sites existing unpermitted facilities and new facilities must:

• Apply for coverage (or modification of coverage) prior to discharging wastewater from the site.
• Complete an engineering report if it plans to construct a wastewater treatment system.
• Comply with SEPA.
• Complete public notice requirements.

The antidegradation regulations for general permits state that individual actions covered under a general permit do not need to go through independent Tier II reviews.

Currently 58 fruit packers discharge to surface water, 50 of which only discharge non-contact cooling water (NCCW). Ecology believes that all the facilities discharging to surface water and currently under coverage of the general permit are satisfying the antidegradation requirements for surface waters of the state of Washington. This general permit incorporates technology requirements that represent AKART to minimize the impact of the discharges on receiving waters.

Ecology wrote the fruit packer general permit assuming that if facilities comply with all the terms and conditions they will meet water quality standards and will meet the state’s antidegradation requirements because they will not cause a measureable change in the quality of the receiving water. Ecology includes the basis for these assumptions in the rationale for setting the effluent limits for discharges to surface waters (see below). The parameters of concern in wastewater discharges to surface water from the fresh fruit packing industry with regards to antidegradation include BOD₅, TSS, pH, total residual chlorine (TRC), chloride, and temperature. The fruit packer general permit restricts dischargers to surface water to those facilities that do not use toxic products in the process other than chlorine-based chemicals. Ecology based the total residual chlorine limit in the general permit on the freshwater standard for chlorine. Should later evidence indicate that facilities do not meet the antidegradation requirements for surface waters, Ecology may modify this general permit to provide more stringent effluent limits, BMPs, or other permit conditions. As with any permit modification, the process will include an opportunity for industry and public review and input. Ecology will review the data collected at the next permit reissuance to ensure these facilities meet water quality standards and antidegradation requirements.

303-D LISTED SURFACE WATERS

The permit does not allow packers to discharge to surface waters if the effluent exceeds a water quality criterion and/or if the receiving water is on the current 303-(d) list for that criterion. Any facility that discharges a pollutant which is on the 303-(d) list for that water body must either select an alternative TDM or participate in the Total Maximum Daily Load (TMDL) process for that water body and meet
any Waste Load Allocation (WLA) assigned by the TMDL. If the facility is unable to meet the WLA under this general permit, the facility must apply for coverage under an individual NPDES permit.

**ALLOWED DISCHARGES TO SURFACE WATERS**

The discharge of fruit packing wastewaters directly into surface waters is only authorized for the following waste streams:

- Wastewater containing no chemical additives at all or only chlorine-based chemicals (i.e., chlorine dioxide and sodium hypochlorite).
- Secondary treated wastewater containing linear alkyl sulfonate (LAS) based soaps, acidic or basic washes, food grade waxes, or chlorine-based chemicals.
- NCCW system wastewater containing no priority pollutants, dangerous wastes, or toxics in toxic amounts.

**BEST MANAGEMENT PRACTICES FOR DISCHARGES TO SURFACE WATERS**

Ecology has determined that discharges to surface water must comply with all of the BMPs and prohibitions listed below. The permittee must:

- Comply with chapter 173-201A WAC.
- Properly install, operate, and maintain a lined sedimentation device or other Ecology-approved measure in order to provide, at a minimum, one (1) full hour of detention time for the sedimentation of process wastewaters except NCCW-only waste streams.
- Ensure that any sludge or solid waste produced during any sedimentation process be treated and disposed of in accordance with the terms of the SWMP in the permittee's ECP. Packers must treat and dispose of sludge and solid waste in compliance with all state and county health department regulations.
- For any discharges containing process water, record and submit all monthly monitoring data on a Discharge Monitoring Report (DMR) form.
- Monitor quarterly and submit on the applicable Yearly Facility Report (YFR) all NCCW-only discharges.
- Do not discharge in excess of those specific numerical limits given in this general permit.
- Do not discharge priority pollutants, dangerous wastes, or toxics in toxic amounts.
TABLE 14 - Effluent Limits and Monitoring for All Discharges to Surface Waters

<table>
<thead>
<tr>
<th>POLLUTANT/PARAMETER AND UNITS</th>
<th>DAILY MAXIMUM</th>
<th>SAMPLE FREQUENCY</th>
<th>SAMPLE TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ALLOWED WASTEWATER EXCEPT NCCW</td>
<td>NCCW ONLY</td>
</tr>
<tr>
<td><strong>Analysis is required for all of the following parameters</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow (gallons/day)</td>
<td>record value</td>
<td>1/discharge event</td>
<td>1/discharge event</td>
</tr>
<tr>
<td>BOD₅ (mg/L)</td>
<td>30</td>
<td>Monthly</td>
<td>Quarterly</td>
</tr>
<tr>
<td>pH (standard units)</td>
<td>6 – 9</td>
<td>Monthly</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Temperature (Celsius)</td>
<td>record value</td>
<td>Monthly</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Total chloride (mg/L)</td>
<td>230</td>
<td>Monthly</td>
<td>Quarterly</td>
</tr>
<tr>
<td>TSS (mg/L)</td>
<td>30</td>
<td>Monthly</td>
<td>Quarterly</td>
</tr>
<tr>
<td><strong>Analysis is required for the following parameter only if chlorine-based chemicals are used:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total residual chlorine (mg/L)</td>
<td>Permit limit</td>
<td>0.019 mg/L</td>
<td>Monthly</td>
</tr>
<tr>
<td></td>
<td>Enforcement (QL) limit¹</td>
<td>0.050 mg/L</td>
<td></td>
</tr>
</tbody>
</table>

¹The established QL (Quantitation Level) will serve as the enforceable limit for this parameter when using the required DPD/colorimeter test method, 40 CFR Part 136. A measured value between 0.019 and 0.05 mg/L may not be a violation due to the uncertainty of the accuracy of test results at this low concentration. Results less than 0.05 mg/L must be reported as “less than 0.05 mg/L.”

**RATIONALE FOR SURFACE WATER POLLUTANT LIMITATIONS**

Ecology used BPJ to determine permit requirements for the following parameters.

1. **BOD₅:** Ecology used secondary treatment standards for municipal wastewater as the basis to limit this parameter to a maximum of 30 mg/L. Municipal permits must meet this limit on a monthly average basis and generally Ecology determines that this limit protects the dissolved oxygen levels in surface waters. To determine if this will satisfy antidegradation, Ecology modeled the analysis of DO sag for the 1999 fact sheet using a biased scenario of a large process water discharge (200,000 gpd or 0.3 cfs) into a small stream at low flow conditions (3.0 cfs). A discharge with a BOD₅ at the maximum effluent limit concentration of 30 mg/L would be diluted to 3 mg/L. The Streeter-Phelps analysis showed the critical DO for this biased scenario was 8.06 mg/L, which exceeds the minimum criteria of 8.0 mg/L. Ecology believes that this limit should generally protect background DO levels. See the 1999 fact sheet for additional details on this analysis.

2. **pH:** Ecology placed the technology-based effluent limits for pH in the permit. Packers must maintain pH in the range of 6.0 to 9.0 which is the water quality criteria level as specified for surface waters in chapter 173-201A WAC.

3. **Soaps and Waxes:** Ecology determined that the level of wax and LAS-based soaps likely to be present in fruit packing wastewater will receive adequate treatment in systems that provide secondary wastewater treatment and meet the BOD₅ limit. LAS-based soaps are widely used and readily biodegradable. The permit only requires the discharger to regularly inspect for foaming at the outfall.
4. **Total Chloride:** The permit restricts total chloride to a maximum of 230 mg/L, which is the freshwater criterion for this parameter. If a packer meets this limit they will meet the freshwater quality criterion which protects water quality.

5. **Total Residual Chlorine:** The permit restricts total residual chlorine to a maximum of 0.019 mg/L, which is the acute freshwater criteria listed in chapter 173-201A WAC.

Due to the lack of a reasonably priced field test kit which can detect total residual chlorine to this level, the established quantitation level of 0.05 mg/L (analytical detection limit), when using the required DPD/colorimeter test method, 40 CFR Part 136, will serve as the enforceable limit for this parameter. A measured value between 0.019 and 0.05 mg/L may not be a violation due to the uncertainty of the test results at this concentration, and must be reported as “less than 0.05 mg/L”. This limit should be protective of background water quality.

6. **TSS:** Ecology used secondary treatment standards for municipal wastewater as the basis to limit this parameter to a maximum of 30 mg/L. Given that the particle size of the TSS associated with fresh fruit packing wastewater is generally large in size, Ecology believes that typical fruit packing wastewater with a TSS of 30 mg/l would not exceed the water quality standard of no more than 5 NTU. This meets the water quality standards for turbidity.

7. **Temperature:** The previous permit required quarterly temperature monitoring of all surface water discharges. Ecology did not specify a temperature effluent limit due to the site specific nature of such a limit. The new permit will continue quarterly temperature monitoring without specifying an effluent limit. Ecology has determined that the current discharges protect background water quality for temperature given the above mentioned BMPs and the relative effluent to receiving water volumes. Any facility which has a surface water discharge to a water body that is on the most recent approved 303(d) list for temperature must participate in the TMDL process for that water body. If the implementation of the TMDL & WLA cannot be completed under this general permit’s requirements, the facility must select an alternative TDM or apply for coverage under an individual NPDES permit.

**NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH**

The EPA has published 91 numeric water quality criteria for the protection of human health that are applicable to dischargers in Washington State (40 CFR 131.36). These criteria are designed to protect human health from exposure to pollutants linked to cancer and other diseases, based on consuming fish and shellfish and drinking contaminated surface waters. Ecology determined that surface water discharges from the fruit packing industry are unlikely to contain chemicals regulated for human health. We conclude this because the permit only allows surface water discharges from facilities that generate the following types of wastewater:

- Containing no chemical additives at all.
- Containing only chlorine-based chemicals (i.e., sodium hypochlorite).
- Treated with secondary treatment which removes the LAS based soaps, acid or basic washes, food grade waxes, or chlorine-based chemicals.
- NCCW containing no priority pollutants, dangerous wastes, or toxics in toxic amounts.
NARRATIVE CRITERIA AND WET TESTING

The narrative and numerical criteria given in chapter 173-201A WAC protect the specific designated uses of all fresh waters in the state of Washington. In addition to numerical criteria, narrative criteria help keep toxic, radioactive, and deleterious materials at concentration levels which cannot adversely affect the designated uses of waters of the state.

NCCW containing chemical additives and wastewater containing chlorine-based chemicals are the only potentially toxic discharges allowed to be discharged into surface waters of the state. Residual chlorine is controlled through the total residual chlorine effluent limits and monitoring. The EPA NPDES Permit Writers Manual (EPA-833-B-96-003) specifies that narrative toxicity criteria should be confirmed using Whole Effluent Toxicity (WET) testing. WET testing will be done on the surface water discharges of NCCW with chemical additives to verify they are not toxic.

Currently there are approximately 21 facilities with surface water discharges of NCCW containing chemical additives. WET testing completed by these facilities showed no significant acute toxicity in 100% effluent. Several facilities showed some chronic toxicity however, these were all relatively small discharges to large receiving waters, such as the Columbia River, resulting in dilution factors well over 1000.

Each facility with a surface water discharge of NCCW containing chemical additives must within one year of receiving coverage under this general permit, submit to Ecology, the results of a rapid screening WET test for acute toxicity, as specified in Table 15. A rapid screening WET test must also be completed within 3 months of any change in chemical additives. Any permittee that fails a WET test must select an alternate Treatment/Disposal Method (TDM) in order to continue to discharge NCCW containing chemical additives. If a permittee fails a WET test, but still wishes to discharge NCCW with chemical additives to a surface water, one of the following options must be completed:

- Select an alternate water treatment regime and repeat the WET test.
- Apply for coverage under an individual NPDES permit.

If a facility with an individual permit meets the requirements of chapter 173-205 WAC for attainment of the WET performance standard it may reapply for coverage under this general permit.

TABLE 15 - WET Testing Requirements

<table>
<thead>
<tr>
<th>Test Name</th>
<th>Test Method</th>
<th>Test Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daphnid 24-hour static test</td>
<td>EPA-821-R-02-012</td>
<td>Ceriodaphnia dubia, Daphnia pulex, or Daphnia magna</td>
</tr>
</tbody>
</table>

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

Ecology requires monitoring, recording, and reporting (chapter 173-220-210 WAC and 40 CFR 122.41) to verify that the treatment process is functioning correctly and that the discharge complies with the permit’s effluent limits.
LAB ACCREDITATION

The permittee must ensure that the monitoring data received by Ecology is prepared by a laboratory registered or accredited under the provisions of chapter 173-50 WAC, Accreditation of Environmental Laboratories. However, the on-site parameters of flow, temperature, pH, and total residual chlorine are exempt from this requirement. Crops and soils data are process control parameters which do not require preparation by an accredited laboratory. However, the permittee must obtain this data from a reputable agricultural test lab that is an active participant in a nationally recognized agricultural laboratory proficiency testing program.

ENVIRONMENTAL COMPLIANCE PLAN (ECP)

In accordance with state and federal regulations, each facility receiving coverage under this general permit must develop and retain on-site, an Environmental Compliance Plan (ECP) with the following four sections:

1. **Treatment/Disposal Method Operating Plan** – In accordance with state and federal regulations, the permittee is required to take all reasonable steps to properly operate and maintain the treatment system (40 CFR 122.41(e) and chapter 173-226-080 WAC).

2. **Solid Waste Management Plan (SWMP)** – Ecology has determined that the permittee has a potential to pollute waters of the state through inappropriate disposal of solid waste or through the release of leachate of solid waste. This general permit requires, under the authority of chapter 90.48.080 RCW that the permittee develop and implement a SWMP designed to prevent solid waste from polluting waters of the state.

3. **Spill Prevention Plan (SPP)** – Ecology has determined that the fruit packing industry stores a quantity of chemicals that have the potential to pollute waters of the state if accidentally released. Ecology can require the permittee to develop BMPs to prevent this accidental release [section 402(a) (1) of the Federal Water Pollution Control Act (FWPCA) and chapter 90.48.080 RCW]. This general permit requires facilities to develop or update and implement the SPP for preventing the accidental release of pollutants into waters of the state and for minimizing damages if such a spill occurs.

4. **Stormwater Pollution Prevention Plan (SWPPP)** – Ecology has determined that the permittee has a potential to pollute waters of the state from stormwater. This general permit requires, under authority of the FCWA 402(p) and chapter 90.48.080 RCW that the permittee develop or update and implement a SWPPP designed to prevent stormwater from polluting waters of the state.

ECONOMIC IMPACT ANALYSIS

Ecology has determined that the changes made in this general permit will not result in a significant change in the economic impact on the industry from the previous permit. However, those facilities that choose to build new lined lagoons or replace/upgrade their lagoon liners after July 1, 2009 will most likely see an economic impact. This impact can however, be offset by lower maintenance costs and longer liner life.
PERMIT MODIFICATIONS

Ecology may modify this permit to impose numerical limits, if necessary to comply with water quality standards for surface waters, with sediment quality standards, or with water quality standards for groundwater, after obtaining new information from sources such as inspections, effluent monitoring, Ecology approved engineering reports, outfall studies, and effluent mixing studies. Ecology may also modify this permit to comply with new or amended state or federal regulations.

WHEN FACILITIES MUST COMPLY

Existing facilities must comply with all terms and conditions of this general permit upon receiving coverage and lasting through the expiration date of this general permit. New facilities must comply with all the terms and conditions of this general permit prior to the commencement of discharge operations and lasting through the expiration date of this general permit.

WHEN COVERAGE IS EFFECTIVE

Unless Ecology either desires to respond in writing to any facility's Application for Coverage or obtains relevant written public comment, coverage under this general permit of such a facility will commence on the later of the following:

- The thirty-first (31st) day following receipt by Ecology of a completed and approved Application for Coverage
- The thirty-first (31st) day following the end of a thirty (30) day public comment period
- The effective date of this general permit

If Ecology desires to respond in writing to any facility's Application for Coverage or obtains relevant written public comment, coverage under this general permit of such a facility will not commence until Ecology is satisfied with the results obtained from written correspondence with the individual facility and/or the public commenter.

PESTICIDES

Ecology has established and will enforce limits and conditions expressed in this general permit for the discharge of waste streams containing various pesticides registered for use by the EPA and the Washington State Department of Agriculture. These agencies will enforce the use, storage, and disposal requirements expressed on pesticide labels. The permittee must comply with both the pesticide label requirements and this general permit’s conditions. This general permit does not supersede or preempt federal or state label requirements or any other applicable laws and regulations. General permit Condition G24 reminds the permittee of this fact.

HAULED DISCHARGES

If any discharges are hauled off-site, the packer bears the primary responsibility for assuring that those discharges are disposed of in strict compliance with all appropriate TDMs, limits, BMPs, and any other terms or conditions of this general permit. The packer is solely responsible for assuring that any hauler
is made aware of all appropriate requirements of this general permit regarding any discharge which the hauler will be disposing. The packer’s responsibilities concerning appropriate treatment/disposal of any discharge will exist in all situations, even when the hauler/disposer is a contracted agent. The contracted agent will be secondarily responsible for assuring that any discharges hauled to off-site locations are disposed of in strict compliance with any appropriate TDM, limit, BMP, or any other term or condition of this general permit.

Specifically when a contracted agent is used, the permittee must retain on-site a written contract, properly dated and signed by both parties (permittee and contracted agent) prior to hauling any discharge. The written contract must include, at a minimum, the following:

1. The name, address, and telephone number of the contracted agent
2. The dates, or time period, for which the contract will be valid
3. The final discharge location of any hauled discharges
4. The nature and volume of the discharges to be hauled
5. A statement that both parties are fully aware and agree to fully comply with their responsibilities as given above
6. Dates and signatures of both parties

GENERAL CONDITIONS
Ecology bases the General Conditions on state and federal laws and regulations.

RECOMMENDATION FOR PERMIT ISSUANCE
This general permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. Ecology proposes that this general permit be issued for five years.
REFERENCES AND DATABASES USED


Agricultural Chemical Usage, Postharvest Applications, Apples and Pears, (USDA, National Agricultural Statistics Service, March 2003, Ag Ch1.).


EPA Re-registration Eligibility Decision (RED) for Captan, (United State Environmental Protection Agency-738-F99-015, September 1999).

EPA Re-registration Eligibility Decision (RED) for Diphenylamine, (United States Environmental Protection Agency-738-R97-010, April 1998).

EPA Re-registration Eligibility Decision (RED) for Thiabendazole, (United States Environmental Protection Agency-738-R-02-xxx, October 2002).


Statement of Basis for the NPDES General Permit to Discharge Non-contact Cooling Water Into the Waters of the State of New Jersey, (State of New Jersey, Department of Environmental Protection and Energy, NPDES Permit No. NJ0070203).

DATABASES

EXTOXNET (Extension Toxicology Network) Pesticide Information Profiles

Toxnet Literature Review, Toxicology Data Network.

Aquatic Toxicity Information Retrieval Database

PAN (Pesticide Action Network) Pesticide Database

Environmental Fate Data Base

PICOL (Pesticide Information Center OnLine) Database
APPENDIX A -- PUBLIC INVOLVEMENT INFORMATION

Ecology determined to reissue this general permit for the fresh fruit packing industry. The original permit and fact sheet were written by Greg Bohn in 1994. The 1999 and 2004 re-issues were written by Steven Huber. This 2009 version was written by Cory Hixon.

Ecology published a Public Notice of Draft (PNOD) on March 4, 2009 in the State Register and the legal sections of the Yakima Herald-Republic and the Wenatchee World and again in the legal sections of the Yakima Herald-Republic and the Wenatchee World on March 11, 2009. Interested persons were invited to submit written comments regarding the draft permit.

Two (2) public hearings on the draft Fresh Fruit Packing General Permit were held in the in the city of Yakima at the Department of Ecology Central Regional Office on March 12, 2009 at 3:00 p.m. The second hearing was held in Wenatchee at the Washington State Apple Commission Building on March 13, 2009 at 3:00 p.m. Interested persons were invited to give testimonials at the public hearings. A one hour workshop preceded each hearing.

APPENDIX B -- RESPONSE TO COMMENTS

The Public Notice of Draft was published in the State Register and the legal sections of the Yakima Herald-Republic and Wenatchee World on March 4, 2009. It was again published in the legal sections of the Yakima Herald-Republic and Wenatchee World on March 11, 2009. Public Hearings were held on March 12, 2009 in Yakima, WA and March 13, 2009 in Wenatchee, WA. The comment period ended April 13, 2009.

Three testimonials were given during the public hearings. These testimonials are summarized below along with Ecology’s response.

TESTIMONIAL 1

Given at the Yakima Public Hearing, March 12, 2009 from Deborah Carter, Technical Issues Manager, Northwest Horticultural Council

“I represent the growers and shippers of Idaho, Oregon, and Washington, we have submitted a hard copy of two letters to the Department of Ecology, just put in Cory’s hands. One letter from Northwest Horticultural Council represents the growers and shippers, the other from Yakima Valley Growers and Shippers Association, representing a variety of members. Both letters are in support of the general permit and we appreciate the opportunity to work with Ecology. We feel we have a good working relationship with Ecology and we would like to continue that relationship and these letters are in that regard.”

Ecology’s Response to Testimonial 1

Ecology appreciates the support given from Northwest Horticultural Council in regards to this general permit renewal. Ecology also looks forward to continuing this good working relationship in the future.
TESTIMONIAL 2

Given at the Wenatchee Public Hearing, March 13, 2009 from Charles Pomianek, Executive Director, Wenatchee Valley Traffic Association

“Our members are the growers, shippers, packers, and marketing firms of tree fruit in north central Washington. We would like to go on record in fully supporting the new five year fruit packing general wastewater permit, as delivered and we would also like to be on record thanking the Department of Ecology for the work and cooperation through the rewrite process over the last couple of years. We believe this permit will help protect the waters and environment in the State of Washington and still provide an opportunity for our members to continue to provide their product throughout the nation and around the world.”

Ecology’s Response to Testimonial 2

Ecology appreciates the support given from the Wenatchee Valley Traffic Association in regards to this general permit renewal. Ecology would also like to thank the Wenatchee Valley Traffic Association for their work and cooperation as well.

TESTIMONIAL 3

Given at the Wenatchee Public Hearing, March 13, 2009 from Laura Mrachek, Washington State Horticultural Association and Cascade Analytical

“We would like to go on record in support of the 2009 version of the Washington State Fresh Fruit Packing General Discharge Permit and to thank the Department of Ecology for working with the industry on the issue of onsite pH and total residual chlorine monitoring requirements and how that can be successfully done in a timely manner. We really appreciate all of the effort that everybody put into the process in support of Ecology and the industry in an effort to encourage environmental accountability. Thanks.”

Ecology’s Response to Testimonial 3

Ecology appreciates Cascade Analytical’s input and knowledge on the issue of onsite pH and total residual chlorine monitoring. Ecology also appreciates the support given from Cascade Analytical and the Washington State Horticultural Association in regards to the general permit renewal.

Four (4) written comments were submitted to Ecology during the comment period. These comments are below along with Ecology’s response.
Ecology's Response to Written Comment 1

Ecology appreciates the support given from the Yakima Valley Growers-Shippers Association in regards to this general permit renewal. Ecology would also like to thank the Yakima Valley Growers-Shippers Association for their work and cooperation.
WRITTEN COMMENT 2

NORTHWEST HORTICULTURAL COUNCIL
106 So. 18th Street, Suite 105
YAKIMA, WASHINGTON 98901 USA
(509) 453-3193 FAX (509) 457-7615
www.nwhort.org

March 11, 2009

Mr. Cory Hixon
Fresh Fruit General Permit Manager
Washington State Department of Ecology
15 W. Yakima Avenue
Yakima, WA 98902

Re: Fresh Fruit Packing General Permit Hearings
    Thursday, March 12, 2009, Yakima, Washington
    Friday, March 13, 2009, Wenatchee, Washington

Dear Mr. Hixon:

The Northwest Horticultural Council represents the growers and shippers of the Pacific Northwest regarding certain state technical issues related to the deciduous tree fruit industry. Regional growers supply 65% of the U.S. fresh apple market, 66% of the U.S. fresh pear market and 65% of the fresh cherry market. Approximately 30% of these crops is exported. The USDA Non-citrus Fruits and Nuts 2007 Summary reports an estimated $2.5 billion dollar value of apples, pears and cherry crops for the region. We offer this letter in support of the 2009 Fresh Fruit Packing General Permit on behalf of this industry.

Since the permit’s inception the tree fruit industry has worked closely with the Department of Ecology to fashion a document that not only addresses environmental concerns but is also doable and effective for the fruit packers of Washington. It is imperative that we protect the land and water from which we make our living and support our regional economies. We believe that the permit is constructed with this need in mind.

Our industry supports the adoption of this permit and looks forward to continuing our collaborative working relationship.

Sincerely yours,

NORTHWEST HORTICULTURAL COUNCIL

Deborah Carter
Technical Issues Manager

Cc: Wenatchee Valley Traffic Association
    Yakima Valley Growers-Shipper Association
    Wastewater Committee
    Washington State Horticultural Association

Ecology’s Response to Written Comment 2

Ecology appreciates the support given from Northwest Horticultural Council in regards to this general permit renewal. Ecology also looks forward to continuing this good working relationship in the future. Ecology would also like to thank Northwest Horticultural Council for their help and cooperation.
WRITTEN COMMENT 3

CITY OF YAKIMA
WASTEWATER DIVISION
2220 East Viola
Yakima, Washington 98901
Phone: 575-6077 • Fax (509) 575-6116

April 13, 2009

Cory Hixon
Washington State Department of Ecology
Water Quality Program
15 W. Yakima Ave., Suite. 200
Yakima, WA 98902

RE: GENERAL PERMIT FOR THE FRESH FRUIT PACKING INDUSTRY

Dear Mr. Hixon,

This letter contains written comments from the City of Yakima Wastewater Division regarding the draft industrial wastewater discharge permit and for the Fresh Fruit Packing Industry.

Permit Comment
§ G27. Response to Significant Violations...What is the definition of a ‘Significant Violation’.

Also, § G27 C. indicates immediate notification to Ecology. Is the POTW immediately notified by the Fruit Pecker or will Ecology notify the POTW of any significant violations, i.e. spills/sludge loads, bypasses, pH violations, etc...

The City of Yakima appreciates the opportunity to provide comments on the Draft General Permit for the Fresh Fruit Packing Industry.

Sincerely,

Arlene Carter
Pretreatment Supervisor
Wastewater Division

Cc: Cindy Huwe, Water Quality Program

Ecology’s Response to Written Comment 3

Ecology uses its best professional judgment in order to determine how significant a violation is. This allows for more flexibility regarding violations on an individual basis.

With regards to discharge violations to POTWs, the permittee should be notifying both the POTW and Ecology. If the permittee fails to notify the POTW, but notifies Ecology, Ecology will immediately contact the POTW and vice versa.
WRITTEN COMMENT 4

Submitted to Ecology via email on March 31, 2009 from Raymond Lam, Silk Road Environmental

I was reviewing the permit and curious why there were no requirements to monitor chloroform or chlorophenolics in the permit when the fact sheet indicates sodium hypochlorite will be used as an additive. Thanks.

Ecology’s Response to Written Comment 4

Sodium Hypochlorite is a commonly used chlorine-based disinfectant in the fresh fruit packing industry and is typically used at low concentrations. As stated in the fact sheet of the Fresh Fruit Packing General Permit, chlorine can form highly toxic chloramines upon contact with ammonia and/or nitrogenous compounds. However, fruit packing wastewaters generally lack significant amounts of ammonia and/or nitrogenous compounds.