December 1, 2003

MEMORANDUM

TO: **Council Members**

FROM: **Leann Bleakney, Oregon office**

RE: **Corps of Engineers presentation**

The hydroelectric generators at Bonneville, The Dalles and John Day dams use industrial grade lubricants to keep them functioning properly. There have been instances in which this oil was discharged into the Columbia River. The oil spills trigger responses from the states of Oregon and Washington and the U.S. Environmental Protection Agency to address water quality violations.

Dale Mazar, assistant director of the operations division at the Corps of Engineers Portland District will talk to the council about the Corps of Engineers' work to address these oil leaks at Columbia River dams.

Frequently Asked Questions

Question	Answer
Are there oil-water separators at the Corps' dams on the Columbia River?	There are presently oil-water separators installed at Bonneville and John Day dams. The oil-water separator for the Bonneville Dam first powerhouse was installed in 1996. The oil-water separator for the Bonneville Dam second powerhouse was installed in 1981, at the time of construction of the powerhouse. The John Day system was installed in early 2003. The Corps is in the process of installing an oil-water separator at The Dalles Dam. Work should be completed by late-July 2003. The Portland District does not operate any other dams on the Columbia River.
How does an oil-water separator work and why do you have them at your dams?	It works much like a gravy separator. The hydraulic oil is lighter than the water and will float to the surface. Baffles, or half walls, in the chamber slow the water flow allowing gravity to separate the oil from the water. The water is then drained off at the bottom, leaving the oil undisturbed on the surface. The oil water separators are intended to catch spills in the event of equipment failure, to keep the oil out of the river. As at any large facility, petroleum products are used for many purposes.
How will the oil-water separator at The Dalles work?	All water in the drainage sump will be skimmed (using absorbent booms in the sump) before being routed to two oil-water separators. The water will be monitored for oil as it comes out of the separator. If oil is detected, the water will be sent through two hydrocarbon filters before it is returned to the river. Any oil will be periodically removed, placed in drums and removed from facility. The water from the drainage sump normally does not contain a significant amount of oil. In the event of a small spill of oil into the sump, the oil/ water separators will be able to meet the National Pollution Discharge Elimination Standards (NPDES) set by the EPA. In the event of a larger spill, the oil/water separators will remove the bulk of the oil and the hydrocarbon filters will remove the remaining oil in the water. The hydrocarbon monitor not only tells the system when filtration is necessary, it monitors the outflow to the river to provide documentation that the system is exceeding EPA standards at all times.
How does the oil-water separator at John Day Dam work?	Water and oil collects in the drainage sump below the powerhouse. Surface materials (oil and oily water) are skimmed from the sump and transferred to the oil-water separator. The water is run through coalescing filters before being returned to the river. Separated oil, if any, is removed and placed in drums. The current system is an interim measure (skimmer and oil-water separator) to improve the effectiveness of returning clean water to the river and capturing oil. The Corps will be evaluating the system during the next several months as it decides whether to install a system similar to the one being installed at The Dalles Dam.
The Corps worked on the Bonneville first powerhouse oil-water separator in 2002. What was the "fix" to the problem? When did it take place?	Work was completed in August 2002. To correct the problems associated with the oil-water separator at the Bonneville first powerhouse, the Corps installed two baffles into the existing chamber (baffles are half wall sections that slow the water flow in the chamber to better allow separation to occur). Changes were made in how some of the water flows into the separator so drains that could flow by gravity directly to the oil-water separator were re-piped to allow this rather than relying on pumps to transfer all of the water from the drainage sump. Most of the problems with the unit were aggravated by the method of pumping. Also, a skimming device was installed to aid in the removal of some of the floating

	oil.
Was the Bonneville problem completely fixed?	No. There are two objectives that we are trying to meet: Less than 10 ppm oil in the discharge and no visible sheen in the water. The discharge has been tested and meets EPA requirement (less than 10 ppm), however, we still have a visible sheen when releasing water from the separator. This is verification that additional work is needed. The Corps is evaluating an option to replace the pumps used to transfer water from the drainage sump to the oil-water separator. The existing pump agitates the water and oil mixture. Additionally, the Corps would like to relocate the discharge pipe, install filters and add a real-time monitoring system.
Has the Bonneville Dam second powerhouse oil-water separator discharged oil in the Columbia River?	No, there is no evidence that it has. The Corps recently verified that the oil-water separator is operating as designed by obtaining samples from the outfall lines, the area where the clean water is returned to the river. They were tested, and no traces of oil contamination were detected. Samples also were provided to the states of Oregon and Washington for their own independent analyses.
Does the Corps need any permits to operate the oil-water separators?	The Corps believes - based on a review of Federal law - a permit is needed only when there is a constant and continual discharge of pollutants into the river from a point source such as the outfall from the separator. That is only occurring with the oil-water separator at the Bonneville first powerhouse, where a very small amount of oil continues to be discharged from the unit. The Corps applied for a National Pollutant Discharge Elimination System (NPDES) permit in Sept. 2002 for the oil-water separator in use at the Bonneville Dam first powerhouse. The Oregon DEQ inspected the site and oil-water separator, and went over permit requirements in February 2003. Further coordination has occurred since then, but we are still awaiting the permit.
What are oils used for at your dams?	As at any large facility, petroleum products are used for many purposes. Primarily, they are used as lubricants and for hydraulic systems. Primarily at Bonneville Dam hydraulic oil is used to operate the turbines. At the first powerhouse, we use Shell Turbo T68, and at the second powerhouse we use Mobil DTE Heavy 100. Both oils are specifically designed to readily separate from water if the two become mixed. At John Day, we use Mobil DTE Heavy 100. At The Dalles, we use Texaco Regal R&O 68.
How much oil does Bonneville Dam use?	At any one time, about 160,000 gallons of oils and lubricants are contained in the 21 turbines and generators housed in two powerhouses on either side of the river.
How much oil does The Dalles Dam use?	At any one time, about 190,000 gallons of oils and lubricants are contained in the 22 turbines and generators.
How much oil does the John Day Dam use?	At any one time, about 190,000 gallons of oils and lubricants are contained in the 16 turbines and generators.
Is oil getting into the river?	The oil-water separator at the Bonneville first powerhouse is the only place where we have a visible release of oil, though testing confirms the amount is within EPA limits. We continue to evaluate our equipment to understand all the possible sources of oil loss. Our objective is to keep oil from getting into the river.
How much are we talking about here?	The discharge from the oil-water separator for the Bonneville first powerhouse is less than 10 ppm. This is the only place where we have a visible release of oil. We have experienced some equipment failures where larger amounts of oil were discharged into the river, but these occurences are rare. With the

	exception of two incidents in 1997 (one at Bonneville Dam - 300 gallons when a pipe failed in one of the turbines and one at John Day Dam - 200 gallons), the releases have ranged from a few tablespoons to several gallons. In most cases there were no recoverable quantities of oil to be cleaned up. With each spill, crews determine the appropriate actions to take to capture and control the oil. When possible, oil that is found in the river is contained and soaked up using oil-absorbent containment booms. All releases into the Columbia River are reported to the National Response Center and state emergency management agencies, as required by law. We also contact the state environmental quality agencies as a courtesy.
What is the flow of the Columbia River at Bonneville Dam?	The volume of water flowing pass Bonneville Dam varies throughout the year depending on current and seasonal weather conditions. However, on average, the river ranges between 70,000 cubic feet per second (cfs) and 440,000 cfs. One cubic foot of water is equal to 7.5 gallons.
Is there a disagreement over what constitutes a reportable spill of oil?	Yes. The Corps' interpretation of Federal law is that only if and when the oil is released into the river does a report need to be filed. Washington Department of Ecology seems to interpret Federal law such that all spills of oil are reportable, even if the spill is contained in the powerhouse. (Letter to Wash. Dept. of Ecology)
What happens when oil is spilled or released inside the powerhouse?	With the amount of oil used at powerhouses the size of those at Bonneville, The Dalles and John Day dams inadvertent oil releases will occasionally happen - either by oil spilling on the floor or from machinery, evaporation or through direct contact with an oily surface. When oil is discharged inside a powerhouse, crews work quickly to fully clean up the oil with absorbent materials and rags. Sometimes, this oil gets into the drains before crews can tend to it. To deal with this possibility, drains in the areas where oil might be discharged are connected to the oil-water separators. These separators act to separate the oil-water mixture into separate components - oil and water. The clean water is then returned to the river and the oil remains in the unit until it is removed and sent to an approved disposal facility. Oil-water separators are designed to keep oil out of the river.
What are the various sources of oil?	The oil can come from several sources: road surface runoff, oil spilled inside the powerhouse and entering the drains, and evaporated oil that has accumulated inside the powerhouse.
Why does the dam have sumps, and what are they used for?	Most of a dam's structure, such as the powerhouse, are actually located below river level. For instance, the portion of the second powerhouse at Bonneville Dam below the river surface is equivalent in height to a 14-story building. There is a certain amount of leakage and drainage of water that enters the structures as a result of the constant water pressure of the river at that depth. This water is drained to the lowest levels of the dam, and contained in a "sump," until it is pumped back up to the river and released. These sumps are normally clean, and contain just the leakage and drainage water.
What is an unwatering sump?	It is a chamber in the lower levels of the dam used to collect large volumes of water drained from turbine units and fish ladders during maintenance operations. Water is channeled to the sump during maintenance operations when facilities that are normally submerged must be drained for human access.
What is being done to keep these spills from happening?	Part of out preventative maintenance program is to routinely inspect and service the sumps and related equipment. Also, the Corps regularly reviews its procedures for handling oil and responding to spills. These reviews have led to improvements in operations, spill prevention, and also spill response. As a result of these recent incidents, the Corps again is looking at these procedures. In addition, the Corps' Hazardous, Toxic & Radioactive Waste Center of Expertise has been tasked with providing additional analysis and advice on the management and control

	of discharges from Federal facilities.
Is there a threat of an oil release from the second powerhouse oil-water separator?	No, there is no evidence of a threat. The separator is working as designed. The total amount of oil water mixture has never exceeded 25 percent of the total 100,000 gallon capacity. Samples of the water discharge taken from the second powerhouse oil-water separator's outfall verify that no oil is being discharged to the river.
What is the Corps' procedure for handling oil spills?	The Corps follows all applicable Federal laws and has specific plans for each dam to follow. In the case of an on-the-ground spill, crews will use absorbent materials and rags to remove the oil. For in-river situations, crews determine whether the oil in the river can be contained and removed. Most small spills dissipate quickly and naturally through evaporation. For discharges that make it to the river, the Corps notifies the National Response Center and state emergency management. As a courtesy, we also notify the state water quality agencies.
Who do you contact in the event of an oil spill?	There is a specific telephone list for each dam. In all cases, the National Response Center is notified as well as the emergency management agency in the state where the facility is located. As a courtesy, we also notify the state water quality agencies.
Are the oil-water separators, or for that matter the entire powerhouse, subject to Washington or Oregon state law?	The Corps of Engineers' legal staff is currently reviewing applicable Federal laws to determine the scope and range of state regulatory authority over oil spills at Federal dams.
Has the Corps ever used dispersants to combat oil at the Columbia River dams?	The use of dispersants is not a common practice for the Corps. That said, there have been some isolated incidents where dispersants and enzymes have been used in the past to clean up oil. As these incidents were identified, corrective action was taken to prevent recurrences. The agency does not purchase dispersants for use at its powerplants.
How many reported oil discharges have occurred at Bonneville, The Dalles and John Day dams?	During the past five years, the following discharges have been reported to the National Response Center: • June 4, 2002 - JD - less than 10 gallons • Feb. 23, 2002 - TD - 25 gallons • Feb. 5, 2002 - Bonn - 5 gallons • Dec. 11, 2001 - Bonn - less than 1 gallon • Sept. 14, 2001 - TD - less than 10 gallons • Aug. 10, 2001 - TD - 35 gallons • March 9, 2001 - Bonn - 4 gallons • Feb. 15, 2001 - Bonn - less than 1 gallon • Nov. 9, 1999 - Bonn - 5 gallons • Sept. 4, 1999 - Bonn - Unknown amount • Feb. 8, 1999 - Bonn - less than 1 gallon • May 14, 1998 - Bonn - Unknown amount