# National Transportation Safety Board

**Office of Railroad, Pipeline and Hazardous Materials Investigations**

***Washington, D.C. 20594***

**Report Date: September 6, 2001**

## ENVIRONMENTAL RESPONSE FACTUAL REPORT

### A. Accident

**Operator:** Olympic Pipe Line Company[1]
**Location:** Bellingham Water Treatment Plant, 3201 Arbor St. Bellingham, Washington
**Time:** 3:30 pm Pacific Daylight Time
**Date:** June 10, 1999
**Ac. No.:** DCA99-MP008

### B. Group Members

[No group formed.]

### C. Summary

About 3:30 p.m. on June 10, 1999, a 16-inch diameter steel pipeline owned and operated by Olympic Pipe Line Company ruptured and subsequently released 236,796-gallons of unleaded regular gasoline into a creek that flowed through Whatcom Falls Park in Bellingham, Washington. Around 1.5-hours after the rupture, gasoline vapors along the Hannah and Whatcom creeks ignited sending massive flames approximately 1.5-miles downstream of the pipeline rupture. Two young boys, both 10 years old, and a young man 18 years old were fatally injured. Eight additional persons had complaints of minor injuries as a result of the incident. A single-family residence and the City of Bellingham's water treatment plant were severely damaged.

[1] Olympic Pipe Line Company consisted of a partnership between Equilon Pipeline LLC (Equilon), Atlantic Richfield, and GATX Terminal Corporation, with Equilon under contract to manage operation of the pipeline for the partnership. Since the accident several ownership and managerial changes have occurred within the Olympic organization with the overall result that British Petroleum (BP) is now the majority owner with responsibility for operation of the pipeline.

## D. Details of the Investigation

The following is a summary of the environmental response efforts to control and remediate the gasoline spill during the emergency response phase.

### 1.0 The Gasoline Release

Around 3:30 pm on June 10, 1999 the 16-inch pipeline, carrying ARCO unleaded gasoline, ruptured and subsequently released 236,796-gallons of product to the environment.[2] By 5:30 pm on June 10, 1999, Olympic Pipe Line (OPL) personnel had determined that the: "Initial worst-case spill estimate was around 6,598-barrels of ARCO-Gasoline unleaded regular. The final loss calculation, made after measuring the remaining product displaced from the line, showed a release of 5,638 BBLS (236,796-gallons) had occurred."

**[See Attachment 2A. – Calculations for Product Loss, OPL-Renton Command; and Attachment 2C. – 23 August 1999 Letter RJ Klassen re: Recap of Displacement Activities at Ferndale Station to Bayview Product Terminal.]**

The rupture occurred immediately adjacent to the City of Bellingham Water Treatment Facility in Whatcom Falls Park. The released product proceeded to flow from the subsurface to the surface and then into the Hannah Creek, a tributary to Whatcom Creek. Once the product reached Hannah Creek, it flowed approximately 1,200-ft. northwest to the confluence of Whatcom Creek[3]. **See: Figure #1,**

Around 5:02 pm, gasoline vapors adjacent to the Hannah and Whatcom Creek ignited. Massive gasoline pool fires extended approximately 1.5-miles from the pipe break at the city water treatment plant, down Hannah Creek, Whatcom Creek and through industrial and residential areas of Bellingham almost to Interstate I-5.

Reportedly, the ensuing fires consumed the vast majority of the gasoline as residual spot fires continued for the next five days near Bellingham's Water Treatment Facility. On June 14, at the direction of the Unified Command, the Bellingham Fire Department extinguished the main source of the fire with foam because of the increasing hazards from the smoke fumes. By this time the extensive fires had burned 25 acres throughout the area.

---

[2] Following pipeline rupture and during restart operations, gasoline continued to be pumped through the pipeline breach.

[3] Whatcom Creek's headwater originates at Lake Whatcom. The creek flow is generally east to west for one mile within Whatcom Fall Park and then extends through residential and business areas in Bellingham before it empties into Bellingham Bay, a part of Puget Sound. The rupture location is approximately three miles inland (east) of Bellingham Bay.

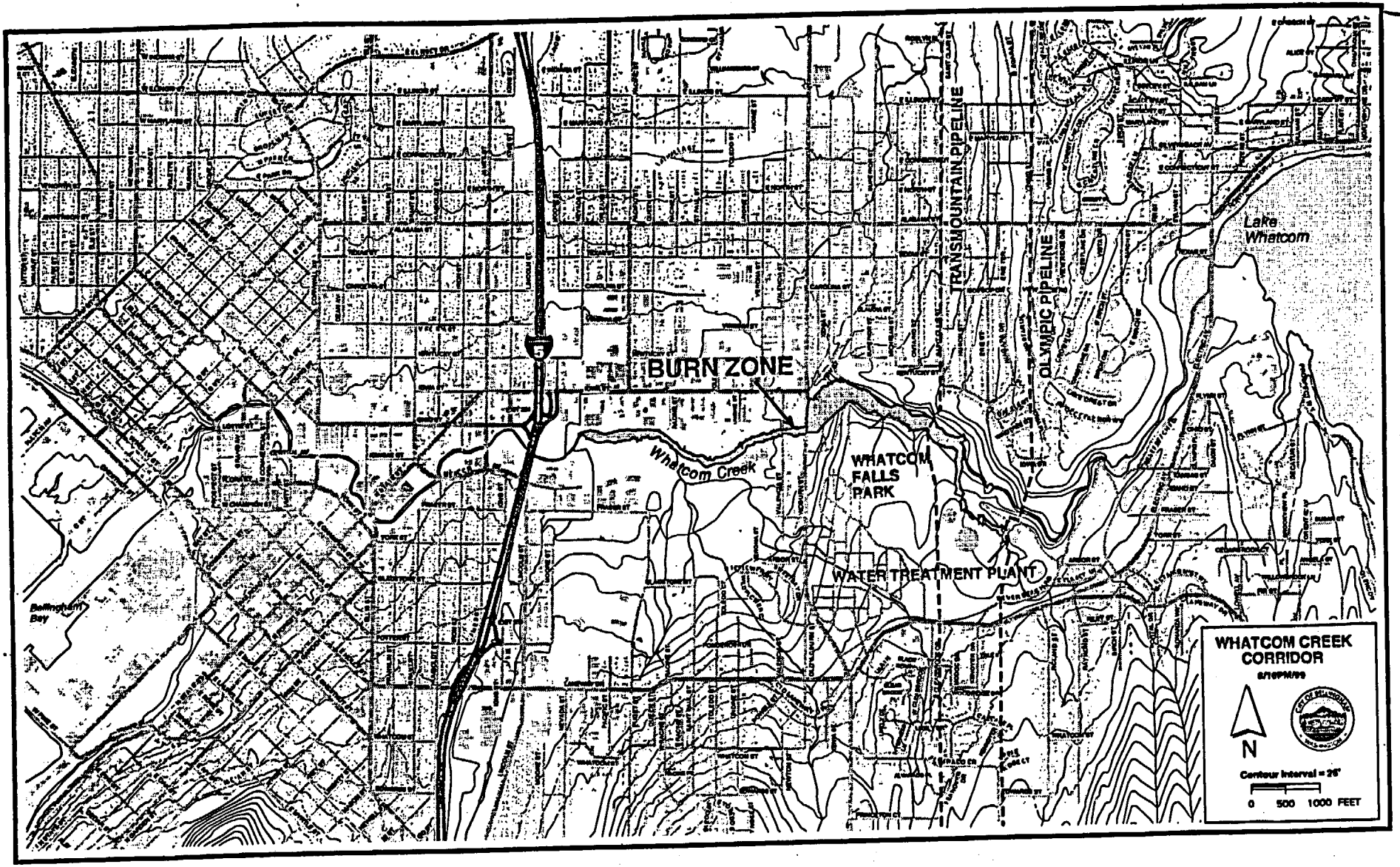


Figure #1. Whatcom Creek Corridor

## 2.0 Command and Control Efforts, June 10 to July 2, 1999

During the first several days, emergency response efforts were focused on evacuation of citizens, site control, search and rescue, air monitoring, health safety, and fire extinguishment. The National Incident Management System/Incident Command System (NIMS) based-ICS[4] was initially established by the Bellingham Fire Department and maintained throughout the emergency phase, from June 10 through July 2, 1999. The Bellingham Fire Department under the ICS led the fire, search and rescue efforts.

On June 10, U.S. Environmental Protection Agency (EPA) Region 10, Seattle, Washington established the Unified Command in support of the Bellingham Fire Department and Washington State Police. The Unified Command included EPA, Washington State Department of Ecology (DOE), Washington State Police, City of Bellingham, the Lummi Tribe and OPL. The Unified Command managed the incident response involving the Federal, State and local agencies including the Joint Information Center, and prepared daily Incident Action Plans (IAPs), which directed daily operational activities, and Pollution Reports, which provided updates on the operations.

**[See Attachment #1: Federal On-Scene Coordinator's Report for the Whatcom Creek – Olympic Pipeline Incident, Bellingham, WA, June 10 – December 31, 1999.]**

A Natural Resource Damage Assessment (NRDA) team, consisting of representatives from the National Oceanographic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), United State Fish and Wildlife Service (USFWS), the City of Bellingham and Washington State Department of Ecology initially met on June 12, 1999 to begin planning the damage assessment of the Whatcom Falls Park. Later an emergency plan would be developed for the restoration of the 25 burned acres on Whatcom and Hannah Creeks.

## 3.0 Olympic Pipe Line Environmental Emergency Response

Under the Olympic Spill Response (OSR) plan, OPL established a command center at its Renton office to handle notifications and initial response activities. Meanwhile, OPL Spill Team members flew to the City of Bellingham Command Center in Bellingham where they were integrated into the Unified Command with Federal, State and local response agencies. The initial OPL response resources included a helicopter, spill trailer with equipment taken from the OPL Renton and Allen Stations, the Equilon Region Response Team, and several spill and consulting contractors.

**[See Attachment # 2: Assessment of Whatcom Creek Incident Emergency**

---

[4] National Interagency Incident Management System (NIIMS)-based ICS. Under the National Contingency Plan, 40 CFR 300, National Response Team has developed the guidance document, the *Technical Assistance Document: Incident Command System/Unified Command – Managing Responses to Oil Discharges and Hazardous Substance Releases.*

**Response Activities - March 22, 2001 letter from Mr. Bobby J. Talley, District Manager – OPL.]**

**Initial Spill Response**. —Shortly before 5:00 pm, OPL personnel began notifying public response agencies. Public emergency agencies responders initially focused on control of the site, containment of the fire, and search and rescue duties. The primary concern was the need to initially isolate the site with security resources and when the site was considered safe, perform search and rescue.[5]

During the initial response on June 10, efforts were underway to track downstream impacts and secure the mouth of the creek at the harbor with boom. In order to protect the harbor and Bellingham Bay from product that might make its way down the creek, OPL contracted Clean Sound, a spill response contractor. OPL requested Clean Sound to deploy boom at the mouth of Whatcom Creek where the creek enters the harbor and Bellingham Bay. Clean Sound immediately installed boom using a 42-ft response vessel at the harbor. During these activities, Clean Sound coordinated with Coast Guard officials at the harbor and later provided at the command center assistance on response, clean up and disposal.

OPL environmental response activities initially included boom deployment at the mouth of Whatcom Creek in Bellingham Bay along with mop-up of remaining product residues in the creeks using sorbents and vacuum trucks. Olympic field personnel moved trailers with sorbent materials and boom to Bellingham and its Allen Station. Pockets of product remaining in Whatcom Creek near Iowa St., and in the vaults at the City Water Treatment Plant were removed by vacuum truck the morning of June 11, 1999. Also on June 11, 1999, OPL's emergency response team, Equiva Services, was mobilized from Houston, Texas to Bellingham, Washington.

Under the direction of the Unified Command as the principle decision making-body, OPL implemented an emergency restoration plan for habitat restoration of the 25 burned acres on Whatcom and Hannah Creeks. The Joint Restoration Committee comprised of City of Bellingham, WDNR, WDOE, and WF&G, National Marine Fisheries Service, NOAA, US Fish and Wildlife, US EPA, Lummi Nation and Nooksack Tribe also reviewed the OPL emergency restoration plan. The initial restoration of the creeks was completed in time for the August salmon run.

**Emergency Streambed Restoration and Source Cleanup**. —OPL hired a crew of 75 local laborers, who were hazardous materials trained, to conduct the stream bank and bed remediation operation. Initially silt fences were installed and crews with float pumps washed down the stream banks. Additionally, crews and heavy equipment were used to agitate creek bed sediments to release gasoline trapped in the sediments under the creeks.

**[See Attachment # 7:** ***A Focus on Response Management: Gasoline***

[5] After several days, OPL took over security and site control responsibilities when the emergency conditions were abated and transitioned from emergency response to a cleanup effort.

***Pipeline Rupture and Explosion at Whatcom Creek (Presentation),*** **Thor Cutler and Anthony Barber, US EPA – Region 10, Seattle, WA.]**

Over several weeks, crews agitated the sediments by walking and jostling rocks with shovels and slam bars, which released the gasoline just beneath the sediments. After the crews conducted four manual passes up and down portions of Whatcom Creek[6], they used two powered track-hoes and a spider hoe to work the sediments and boulders to a depth of up to two feet below the creek bottom. During these daily operations, the creek flow was reduced at the Whatcom Lake gates and following the daily sediment reworking, the creek level was raised 1-2 feet to flush Whatcom Creek for about 12 hours each night. After the completion of the mechanical agitation of the streambed, the bed was restored to a complex of pool and riffle habitat types with woody debris incorporated in some of the pools.

**Source Area Cleanup.** -- Once the petroleum hydrocarbon levels were reduced through the emergency streambed remediation activities, a short-term restoration plan was developed to further enhance the habitat of both Whatcom and Hannah Creeks.

Over 1200 feet of the creek bed and banks were removed by excavator along the upper portion of Hannah Creek where the creek bed and banks were saturated with gasoline up to five feet into the creek face. In these areas, the creek was dammed and bypassed through a pump and an eight-inch PVC pipe to Whatcom creek. Following its excavation, the creek was backfilled with glacial gravel tills and trees, jute mats, gravels and boulders were placed to groom the creek. Water was eventually rerouted back into the creek prior to the winter flood level rain season.

Areas of contamination were delineated using surface soil samples, monitoring wells, and direct push sampling instruments. Excavation steps removed the majority of unburned gasoline. Soils were sampled and trucked to Tacoma, WA. where they were incinerated. Contaminated soils near the pipeline break were excavated and soils were incinerated off site. Over 9,500 cubic yards of contaminated soils were removed of which 2000 yards were removed from the Hannah creek and 7,500 yards were removed from the pipeline rupture area and water pump vault area.

The quarter mile of Hanna Creek below the area that was excavated was treated by agitation. During the hand agitation process, the uncontaminated inflow was also diverted by pipe into the Whatcom Creek to promote volatization of the streambed. However, ground water inflow kept the sediments wet, preventing significant volatilization of the streambed. After hand agitation had removed any visible sheen, the bypass water was restored to promote flushing of residual contamination. Several seeps flowing into the creek were sampled and identified as contaminated with gasoline. Further remediation was not pursued because it would have involved removing significant riparian vegetation and may not have been successful in accelerating remediation beyond that achieved through natural attenuation.

Gasoline seeps also became apparent north of the source area and skimmer operations were set up to manage the releases to Whatcom Creek. Subsurface probes outlined a gasoline

[6] Some parts of Whatcom Creek could not have been treated because of poor access.

pocket that flowed from the rupture area through bedrock to Whatcom Creek. As a result, a ground water interception and treatment system was used to address gasoline seeps that formed along the Whatcom Creek bank. A 450-feet horizontal boring was installed for an interception trench 25 feet below grade between the subsurface gasoline source area at the Dakin-Yew pump station vault and Whatcom Creek. This trench successfully intercepted the gasoline moving north through the shallow bedrock prior to entering Whatcom Creek where seeps had been observed in the first days of the incident. Finally, a pump and gasoline/water separation system was installed which drew down the ground water and intercepted the gasoline that migrated toward Whatcom Creek.

To address additional residual gasoline in surrounding areas that were not excavated, a vapor extraction system was designed and installed with a catalytic oxidation system. The system was completed under the emergency restoration plan, bypassing any potential permit delays related to construction, and began operation on December 15,1999. Future efforts will include the operation and maintenance of the systems for several years until the site is remedied. It is anticipated that a long-term creek restoration plan will be developed to include the operation and maintenance of the vapor extraction and ground water interception systems.

As of October 7, 1999, a total of 16,717 gallons of gasoline were recovered. Bellingham's drinking water capacity was restored and initial restoration of the creeks was completed in time for the August salmon runs. Emergency source area remediation activities were completed in January 2000. The EPA OSCs concluded that: "The Whatcom Creek Incident was an excellent example of the ICS being utilized as an effective management tool for a large, multi-jurisdictional emergency response and subsequent cleanup activities."

**Oil Spill Preparedness**

OPL responded to the release under its Oil Spill Response Plan (Facility Response Plan) Rev. 11/98. Following the accident and a subsequent spill from Olympic Pipeline on August 29, 1999, the Washington Department of Ecology conducted a review of the Olympic Pipeline Oil Spill Response Plan and found deficiencies in the notification procedures. As a result, the Washington Department of Ecology issued an Administrative Order requiring that the spill plan be amended to comply with Chapter 90.56 Revised Code of Washington. Olympic Pipeline complied with the requirements and amended its existing plan.

RSPA also conducted a Minimum Adequacy Review under 49 CFR Part 194, Response Plans for Onshore Oil Pipelines. In its July 19, 1999 correspondence, RSPA identified eight areas where sufficient information was not provided by the OPL Spill Response Plan, i.e. Plan Information Summary, Notifications,[7] Spill Detection and Mitigation Procedures, Response Management, Response Equipment and Transportation, Response Documentation and Worst Case Discharge, Response Plan Maintenance and Area Contingency Plan and Concept of Operation. On January 25, 2000, OPL submitted the newly revised Oil Spill Plan to RSPA and

[7] RSPA commented that the Facility Response Plan notification provisions were not complete, consistent or accurate.

all revisions were accepted.

**[See Attachment # 6 : July 19, 1999 letter from J. E. Taylor, Research and Special Programs Administration to S. M. Conlan re: Review of OPL Facility Response Plan. See Attachment #9. Washington Department of Ecology Administrative Order No. 99SPPRHQ-54.]**

- **Drills/training.** The following Tabletop and Equipment Deployment Drills were conducted to test the readiness of response personnel and equipment.

  - May 7, 1997
  - September 9, 1998
  - April 7, 1999

Spill Management Team Tabletop and Deployment Drills were conducted annually to review the response plan preparedness. In its evaluation of the May 1997 tabletop drill, the Washington Department of Ecology strongly encouraged Olympic Pipeline personnel to get additional training in the Incident Command System prior to the upcoming worst case spill drill in 1998. Olympic complied with the request, and Washington Department of Ecology evaluation of the company was that it performed well in the 1998 Area Exercise.

The Area Exercise was conducted at the ARCO Cherry Point Refinery in Whatcom County in September 1998 under the direction of the U.S. Department of Transportation, Research and Special Programs Administration, Office of Pipeline Safety. This PREP Area Exercise was conducted as part of a continuing series of spill response training exercises aimed at improving the effectiveness of the OPL Spill Management Team. The focus of the drill included exercising the Northwest Area Contingency Plan, OPL Oil Spill Response Plan, use of the NIIMS ICS as well as the ability of OPL to work with Federal, state and local spill response agencies and form a Unified Command. The response exercise involved a hypothetical 5,500 barrel spill of Diesel Fuel into the Nooksack River and Bellingham Bay.

**[See Attachment # 3: WDOE Ecology Spill Drill Evaluation Checklist: OPL Spill Management Team Table Top and Deployment Exercise: April 7, 1999; Attachment # 4: OPL September 9, 1998 Oil Spill Drill Evaluation Report by Environmental Compliance Option; Attachment # 5: OPL May 7, 1997 Oil Spill Response Exercise Report by Meyers and Associates; and Attachment # 8: February 12, 2001 letter from L. Pilkey-Jarvis, WDOE re: Lessons Learned.**

Tom Lasseigne

## Attachments

1) **Attachment #1: Federal On-Scene Coordinator's Report for the Wahatcom Creek – Olympic Pipeline Incident, Bellingham, WA, June 10 – December 31, 1999.**

2) **Attachment # 2: Assessment of Whatcom Creek Incident Emergency Response Activities - March 22, 2001 letter from Mr. Bobby J. Talley, District Manager – OPL.**

    A. **Calculations for Product Loss, OPL-Renton Command**
    B. **Special Patrol Report, Hillcrest Aviation**
    C. **23 August 1999 Letter RJ Klassen re: Recap of Displacement Activities at Ferndale Station to Bayview Product Terminal**
    D. **Materials Safety Data Sheet: ARCO Unleaded Gasoline**
    E. **Resources Summary: June 10 thru 13, 1999**
    F. **Olympic Spill Response Plan: Table of Contents, Resources, Strategies and Summary of Socioeconomic Resources**
    G. **Incident Command System: Organizational Chart**
    H. **Final Disposal Tracking Inventory**

3) **Attachment # 3: WDOE Ecology Spill Drill Evaluation Checklist: OPL Spill Management Team Table Top and Deployment Exercise: April 7, 1999.**

4) **Attachment # 4: OPL September 9, 1998 Oil Spill Drill Evaluation Report by Environmental Compliance Option, January 1999.**

5) **Attachment # 5: OPL May 7, 1997 Oil Spill Response Exercise Report by Meyers and Associates.**
6) **Attachment # 6: July 19, 1999 letter from J. E. Taylor, Research and Special Programs Administration to S. M. Conlan re: Review of OPL Facility Response Plan.**

7) **Attachment # 7: Presentation: *A Focus on Response Management: Gasoline Pipeline Rupture and Explosion at Whatcom Creek*, Thor Cutler and Anthony Barber, US EPA – Region 10, Seattle, WA.**

8) **Attachment # 8: February 12, 2001 letter from L. Pilkey-Jarvis, WDOE re: Lessons Learned.**

9) **Attachment #9. State of Washington Department of Ecology Administrative Order No. 99SPPRHQ-54, December 2, 1999.**