BEFORE THE STATE OF WASHINGTON
ENERGY FACILITY SITE EVALUATION COUNCIL

In the Matter of Application No. 96-1, Olympic Pipe Line Company Cross Cascade Pipeline Project	EXHIBIT _____ (TO-T)

PREFILED DIRECT TESTIMONY

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

WITNESS: TONY OPPERMANN

(Project Impacts to Fish and Wildlife Resources West of Snoqualmie Pass)

PRE-FILED TESTIMONY OF TONY OPPERMANN

TOPIC: Cross Cascade Pipeline
SPONSOR: Washington Department of Fish and Wildlife

Name and Business Address:

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Occupation and Position:

I am an area habitat biologist with the Washington Department of Fish and Wildlife (WDFW). I currently work in the Habitat and Lands Program, Region 4 office for King and Snohomish Counties.

Experience and Training:

I have a Bachelor of Science degree in Fisheries Science from the University of Washington, College of Fisheries (1972).

I have been employed by the same agency since December 1974. I have been in my current position since December 1987. I review and issue or deny Hydraulic Project Approval (HPA) permits for the protection of fish resources in the Snohomish River watershed (which includes the Skykomish and Snoqualmie Rivers). I work closely with representatives of other state agencies (DNR, DOE & WSDOT), various departments of King and Snohomish Counties (Public Works, Planning, Roads, etc.) and numerous other local jurisdictions (Cities, Utility Districts, etc.) in both counties. I review and comment on proposed developments ranging in size from backyard footbridges over small urban streams, to construction of highway bridges and bank protection/flood control levees on large rivers. I am responsible for issuing (or denying) HPA permits to assure the protection of fish life, for any construction projects that may "...use, divert, obstruct or change the natural bed or flow..." of any salt or fresh waters of the state. HPA permit requirements include the time period within which work may occur, provisions required for the protection of, and any mitigation that may be required for, unavoidable impacts to fish and fish habitat.

Prior to 1987, I worked for six years as a fish culturist in the Puyallup Fish Hatchery, raising and planting fish for the sport fishery in King, Snohomish, Pierce and other counties. During my first seven years with the Department, I was a Fish Biologist in the Steelhead Data and Management Program. I was responsible for supervising field personnel gathering harvest information from sports and commercial fishers, conducting steelhead spawning surveys and conducting a fry abundance study to determine the relative productivity of several Puget Sound and Olympic Peninsula streams.

Purpose of Testimony:

The purpose of my testimony is to identify the impacts I believe may occur as a result of the construction of the project through the area in which I am familiar, and have responsibility for the protection of the fish resources.

Snoqualmie River (above the Snoqualmie Falls) and South Fork Snoqualmie River:

The proposed pipeline route crosses numerous streams tributary to these rivers. Most of these tributaries provide spawning and rearing habitat for resident cutthroat and rainbow trout as well as other fish and aquatic species such as tailed frogs, salamanders and invertebrates.

Potential Construction and Post Construction Impacts:

There are several alternative methods to install conduits (sewer/water lines, fiber optic cables, natural gas lines, etc.), through rivers or streams. We (Area Habitat Biologists) recommend attaching them to existing bridges, directional drilling or boring underneath streams/ rivers and/or wetlands. Occasionally, aerial suspension over a stream is used, but this is primarily for wire, cable or small water lines. Generally, the last choice is to use trenching, i.e., digging a trench, laying in bedding material, installing the conduit then refilling the trench with suitable, stable fill material. Trenching is usually the last choice because the work must be done in the dry, any fish present must be captured and relocated, water quality is degraded during and for some time following the work, and the stream bed and banks take a long time to fully recover to a healthy pre-project condition.

When boring or trenching, it is vitally important to get the conduit well below the scour depth. There is a pair of gas supply pipes crossing a very small stream southeast of the City of Snohomish, that was installed several years ago. I was told the pipes were buried four to five feet below the stream bed. Recently, a beaver dam about 1200 feet upstream of the crossing collapsed and in a matter of a couple of hours both pipes were exposed and the stream was actually flowing underneath the pipes. A fairly extensive stream restoration project was required to protect the pipes. The site will have to be monitored for three to five years to make sure the recovery is successful.

Another example of a pipeline not being deep enough is a City of Everett water supply line, originally buried five feet below the Pilchuck River. The four foot diameter pipe was recently exposed about half way across the channel (forty to fifty feet). There were no catastrophic flows associated with this event, just channel erosion and downcutting over several years. To protect this pipe, a stream bed control structure was built just below the pipe to encourage deposition of streambed material to cover the exposed portion of the pipe. This site will also need monitoring over time.

Construction in the dry:

To do the work in the dry means the stream or river must be diverted away from the work area for the duration of the construction. Diversions are expensive, time consuming and tricky, not to mention in some cases dangerous. To divert a small stream, a coffer dam is installed or a pond is created upstream of the crossing site and the water is channeled into a culvert, flume or flexible pipe, directed around the work area and released back into the stream channel far enough downstream so as not to back flow into the work area or the trench. Smaller streams may be pumped around the site provided the pump(s) can handle the total flow volume even if it rains during the operation.

Prior to trenching operations, any fish present in the immediate work area must be collected and transported to a safe location (usually upstream).

Trenching a larger stream or river is usually done in two stages by building a coffer dam to isolate half of the river, installing the conduit, then doing the same from the opposite bank and making the connection in the middle. The material used to fill a trench must be large or solid enough that erosion, high flows or channel changes will not erode or wash out leaving the conduit exposed. Regardless of whether the stream is large or small, trenching is a physical intrusion into the stream bed and banks. There is no way to avoid leaving loose sand, soil, rock or debris in a trench operation. When water is finally released to flow back into the channel, some of this material is stirred up and transported downstream as suspended sediments.

After a trenching operation a stream takes a long time to return to its pre-project condition. The stream bank is necessarily exposed during trenching and is therefore no longer as stable, unless heavily rip-rapped (which is definitely not preferred). The riparian vegetation is eliminated which may reduce shading, stream bank stability and nutrient input that are all extremely important in maintaining a healthy aquatic environment. Streamside shrubs may be reestablished in a relatively short time, but larger trees that provide summer shade to help maintain cool water temperatures and that eventually fall in the water to provide fish habitat, may take several years to grow to a size that will be of benefit to the stream.

For the above reasons, trenching should only be considered as a last resort. Bridge attachments are best because of the low impact to habitat. Boring or jacking methods can also avoid some habitat impacts, but they are more difficult techniques, requiring detailed planning, special expertise and appropriate mitigation and restoration.

Tunneling or boring underneath a stream is not a fool proof operation. I personally know of at least three occasions where problems have occurred with boring procedures. One is on Smokehouse Creek (tributary to Lake Washington via North Creek), where the stream bed collapsed into the boring pit. In this case an extension of the time period for the work had been allowed (into the time coho salmon were migrating upstream to spawn) after the proponent had convinced WDFW that it would only be a couple of extra days and that they would be extra careful. The boring was not done deep enough, and the stream bed collapsed into the boring tunnel and pits. As a result there was a possible loss of some spawning habitat and surely a loss of fish rearing habitat in the immediate area of the trench for at least one season. Full restoration of the damaged channel was required adding substantial cost to the project.

A second occurrence was on Lake Stevens Creek (a tributary to Lake Stevens). In this case, the contractor thought he was boring under a pipe arch culvert. In fact, the culvert was a bottomless arch culvert, the boring was again not deep enough and the stream fell into the boring tunnel and pits. The stream provides spawning and rearing for kokanee salmon and cutthroat trout. Fish were likely washed into the trench but the water was so muddy that they would not have been seen.

A third incident was similar, except that the culvert the contractor was boring under was a solid concrete culvert under a roadway. In this case the pipe was broken at a joint and could not be seen. As in the first two cases, the stream poured into the boring tunnel and pits, the stream had to be diverted around the break and repairs quickly made. This is a stream that contains coho salmon and cutthroat trout.

Potential Causes for Pipeline Damage or Failure:

There are many streams proposed for crossing by the Olympic Cross Cascade Pipeline proposal in the area between Snoqualmie falls and the Cascade Crest (John Wayne) Trail tunnel. Most of the streams east of North Bend are very steep gradient tributaries to the South Fork Snoqualmie River. Some of these are in “rain on snow” zones. This means they are at an elevation where they will get snow during colder periods but are also apt to get rained on if the temperatures go up slightly. When this occurs, the rain falling on a build up of snow causes rapid thawing of the snow and small drainages often turn into raging torrents. The term “debris torrent” is used to describe the phenomenon when timber slash or an accumulation of trees and other debris is picked up by abnormally high water flows and is carried down the stream channel. There is an excellent example of what a debris torrent can do in Hall Creek, a tributary to the South Fork Snoqualmie River. A steel railroad trestle about 150 feet high over the creek was knocked out by such an event. Steel “I” beams 15 or 20 feet above the side of the stream (about 40 feet above the stream bed) were bent, four supports set in large concrete blocks were knocked out, and a 170 foot section of the railroad track was taken with it. This is a stream that a person can usually walk across in knee boots. I don’t know if this streams bed was deepened any, but this type of event in any stream without a bedrock bottom could easily be scoured out several feet deep.

Headcutting is another problem occurring on some of these tributaries. This is a natural process that takes place when a stream starts to meander. A headcut may start as the result of a slope failure (landslide), a stream channel aggrading (filling up with sediments and/or debris) or some other event causing it to seek another path. It will start to develop a new channel by eroding away the existing banks (meandering) upstream. This can be easily seen on any aerial photo or map of any lower elevation stream. Headcutting or meandering of a stream can cause a channel to move a short distance or several hundred feet. Headcutting is usually a slow process, but can occur very rapidly given the right combination of stream flows and soil conditions.

<u>Potential Impacts of a Pipeline Crack or Failure:</u>

As noted above, many of the streams along this pipeline route are very steep. A very small spill of any fluid substance would be virtually impossible to control, contain or recover. High velocity stream flows due to steep gradients would cause rapid downstream transport of any spilled material and rapid mixing with the river below. Recovery of spilled material would be impossible because of the dilution that would result from mixing the stream and river flows. The remote location of most of the proposed stream crossing sites would likely result in delayed detection and could be difficult to access with spill clean-up equipment.

I would expect a thorough geotechnical study would need to be conducted along the route, especially in the vicinity of the steep slopes. It seems that a facility such as the proposed pipeline could be (should be) located along the I-90 ROW. Tinkham Road also parallels I-90 for some miles in this area, is a lower elevation and has flatter terrain than the Cascade Trail route.

END OF DIRECT TESTIMONY

I declare under penalty of perjury that the above testimony is true and correct to the best of my knowledge.

EXECUTED this ______ day of February, 1999.

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TONY OPPERMANNN