Exhibit No. ___T (DL-1T)
Dockets UE-120436, et al.
Witness: David Lykken

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **AVISTA CORPORATION, d/b/a AVISTA UTILITIES,** **Respondent.**	**DOCKETS UE-120436/UG-120437** ***(consolidated)***
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **AVISTA CORPORATION d/b/a AVISTA UTILITIES,** **Respondent.**	**DOCKETS UE-110876/UG-110877** ***(consolidated)***

TESTIMONY OF

David Lykken

STAFF OF
WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION

Re: Aldyl A Pipeline Replacement Program

September 19, 2012

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I. INTRODUCTION

Q. Please state your name and business address.

A. My name is David Lykken. My business address is 1300 S. Evergreen Park Drive S.W., P.O. Box 47250, Olympia, WA 98504.

Q. By whom are you employed and in what capacity?

A. I am employed by the Washington Utilities and Transportation Commission as the Pipeline Safety Director.

Q. How long have you been employed by the Commission?

A. I have been employed with the Commission for approximately 12 .5 years.

Q Would you please state your educational and professional background?

A. I began my employment as a Pipeline Safety Engineer at the Commission in 2000. I was the Commission's Chief Pipeline Safety Engineer from 2004 to 2009, when I began my current position as Pipeline Safety Director.

Prior to my employment at the Commission, I was employed by Washington Natural Gas Company for 18 years and Puget Sound Energy for two years. In these positions, I gained extensive technical knowledge and experience in natural gas pipeline construction practices, operations, and maintenance, as well as safety regulation. While employed by these companies, I held management level positions as a Construction Coordinator and Operations Supervisor, responsible for

coordinating job planning and projects, and ensuring compliance with company policies and procedures, as well as pipeline safety regulations.

II. SCOPE AND SUMMARY OF TESTIMONY

Q. What is the scope of your testimony in this case?

A. I address Avista's Aldyl A pipeline replacement program, with particular focus on the Company's Distribution Integrity Management Program DIMP).

Q. Please summarize your testimony.

A. The Aldyl A pipe at issue in this case is polyethylene pipe manufactured by DuPont before 1984. This pipe is susceptible to premature "brittle-like" cracking and subsequent "slow crack growth", which eventually leads to gas leaks. There have been a number of serious pipeline incidents associated with plastic pipe materials identified as being susceptible to brittle-like crack failures. Brittle-like cracking can be caused by high localized stress intensification that may result from geometrical discontinuities, excessive bending, improper installation, or dents and gouges.

Other factors that can lead to premature brittle-like cracking are the pipe's environment and service conditions under which the piping is used. These conditions include inadequate support and backfill during installation, and rock impingement. The vulnerability of this material to premature cracking represents a serious hazard to public safety.

Over the next 20 years, Avista proposes to replace all DuPont Aldyl A mains that are 1¼ inch to four inches in diameter, as well as all "steel to plastic" service connections. Avista defends this program on the basis of its Distribution Integrity Management Plan (DIMP).

Based on my understanding of the nature of this pipe, and my review of Avista's DIMP, I conclude that this pipe ranks as a priority safety risk for Avista's gas pipeline system, and the Company should replace it

III. DISCUSSION OF ALDYL-A PIPE

A. Background

Q. Please describe the Aldyl A pipe at issue in this case.

A. "Aldyl A" is the name given to certain types of polyethylene pipe manufactured by DuPont. As Avista describes in Exhibit No. ___ (DFK-3), DuPont manufactured this pipe using various formulas over time. The Aldyl A pipe at issue in this case is the pipe DuPont manufactured before 1973 (Pre-1973 Aldyl A) and before 1984 (Pre-1984 Aldyl A).

DuPont manufactured this pipe in various diameters. The pipe at issue here are 1¼ inch diameter to four inch diameter main pipe. Pipe with diameters above or below this range do not present the problems of pipe within this range.

Q. How much of this pipe does Avista have in its system?

A. According to Avista, the Company has approximately 8,500 miles of Aldyl A pipe in its system, 46 percent of which is located in Washington. The Company also has 16,000 service tees that connect to Aldyl A pipe, 46 percent of which are in Washington.

Q. What are the problems with this pipe?

A. According to Avista, there are four problems: 1) Overtightening of caps on plastic service connections; 2) Rock Contact and squeeze-off; 3) Plastic services tapped from steel mains; and 4) Settlement of the main pipe. Exhibit No. ___ (DFK-3) at 18.

Q. What is Avista doing about these problems?

A. Avista analyzed these problems in the context of its DIMP. The result is that this Aldyl A pipe presents the second most significant safety risk on the Company's system, after third party damage. As a consequence, Avista is treating this as a priority item, and is proceeding to replace the pipe over a 20-year period.

B. The Distribution Integrity Management Plan

Q. What is a Distribution Integrity Management Plan?

A. A Distribution Integrity Management Plan, or DIMP, is a plan under which a gas pipeline company must evaluate the safety risks on its system and then make a plan to address each of the risks in some manner.

In 2009, the federal Pipeline and Hazardous Materials Safety Administration (PHMSA) published the final rule establishing integrity management requirements for gas distribution pipeline systems in 2009, effective February 12, 2010. PHMSA gave pipeline operators until August 2, 2011, to write and implement their programs. The rules are found in 49 C.F.R. Part 192, Subpart P, beginning at § 192.1001.

The PHMSA rules do not mandate how the gas pipeline must respond to a particular risk. Rather, the purpose of the DIMP is to identify the risk and then the pipeline company can design steps to address the risk. The objective of a DIMP is to help manage the integrity of a gas distribution system to protect lives and the environment.

Q. What are the required elements of a DIMP?

A. The required elements of a DIMP are:

- Knowledge
- Identify Threats
- Evaluate and Rank Risks
- Identify and Implement Measures to Address Risks
- Measure Performance, Monitor Results, and Evaluate Effectiveness
- Periodically Evaluate and Improve Program
- Report Results

Collectively, these elements establish a program that should help a gas utility reasonably manage the integrity of its distribution pipeline system on a going-forward basis.

Q. Does Avista have a DIMP?

A. Yes. In fact, Avista was part of PHMSA's DIMP Pilot program. Avista was one of six natural gas companies chosen to participate. As a result, Avista began working on its DIMP about two years before the PHMSA DIMP rules went into effect. This is helpful because creating the DIMP is a very complex process.

Q. Please describe some of these complexities.

A. For example, Avista "scrubbed" through 5 years of leak data, re-examining how each leak failure was categorized based on Avista's current leak failure categories. In addition, Avista reviewed its existing records for incident and leak history, corrosion control records, continuing surveillance records, patrolling records, maintenance history, exposed pipe reports and excavation damage experience. Avista then developed a data collection matrix to list additional information needed to fill in the gaps.

Collecting data is a continuous process as new facilities are constructed or older facilities are reconstructed, not to mention ongoing operations and maintenance. All relevant information is collected and maintained within the DIMP.

To identify existing threats to the distribution pipeline, Avista evaluates several categories of threats that could threaten the integrity of the pipeline. To identify potential threats which are not currently evident based on failures, leak or incident data Avista used environmental data and Subject Matter Experts.

To evaluate and rank identified threats, Avista uses sophisticated software to build risk models in which each risk is assigned a ranking score. Avista maps its system using 50 foot square grids, and the model evaluates each risk with respect to each grid. This generates a total score for each risk, and results in a risk rating of high, medium or low.

Q. Has Avista's DIMP Program been audited?

A. Yes. Avista has been audited twice, first as part of the PHMSA pilot program and again as a joint Washington, Oregon and Idaho DIMP Inspection conducted July 10–11, 2012, at Avista headquarters in Spokane, Washington. Based on that audit, Staff believes Avista's DIMP is in compliance with both federal and state rules.

Q. What are the three most significant safety risks Avista's DIMP identifies?

A. The three most significant safety risks on Avista's system in Washington are, in order: 1) Excavation Damage; 2) material f, defined as (a) Aldyl A SCG/LDIW Pipe/Bending Stress and (b) Aldyl A Services Tees; and 3) welds/joints defined as (a) Weld/joints-steel welds, (b) Weld/joints-mechanical joints and (c) weld/joints – PE joints.

Q. What does Aldyl A "SCG/LDIW" mean?

A. The term LDIW stands for "Low Ductile Inner Wall" pipe manufactured by DuPont prior to 1973, and SCG stands for "Slow Crack Growth", otherwise known as "brittle-like cracking", which is a part-through crack initiation in the pipe wall

followed by stable crack growth at stress levels much lower than the stress required for yielding.

Q. In brief, how did Avista come up with this ranking?

A. Avista established a base line level of performance of the pipe and evaluated changes from the base line. If the change is within five percent of the base line, that means the risk is "stable"; above five percent the risk is "increasing"; and below five percent, the risk is "decreasing". Avista's analysis showed the risk associated with Aldyl A pipe was increasing, which placed it in a category meriting accelerated action.

Q. Does the existence of these risks Avista identified in its DIMP mean the Company's system is unsafe?

A. No. There are safety risks inherent in all pipeline systems that use underground piping. However, while the existence of safety risks does not mean the system is unsafe, risks should be addressed to the extent it is feasible to do so. The goal of the DIMP process is to rationally itemize and begin (or continue) to address each of the risks in some way.

For example, Avista's primary safety risk, by far, is third party damage to the pipeline. This is not surprising, and it is fair to say that third party damage is likely the primary safety risk for all gas distribution companies with an extensive amount of gas plant located in public right of way.

Q. How does Avista plan to manage the highest risk factor; excavation damage?

A. In brief, Staff understands Avista is creating a new group within the company that will likely have one supervisor and at least two inspectors. I also note that recent changes in the state's "Call Before You Dig" law are designed to mitigate this risk, as well.

Q. How is Avista addressing the second highest risk factor, material failures in Aldyl A pipe?

A. Avista is embarking on a 20 year, $200 million program to replace this pipe system-wide.

Q. Is this replacement program appropriate?

A. Yes. As I testified earlier, the rules mandating the DIMP do not prescribe the steps the gas pipeline must take to address a particular problem. Given the nature of pre-1984 Aldyl A pipe and the risks it presents to Avista and its customers, Avista should replace this pipe.

Given Avista's cold winter temperatures frozen ground in much of its territory, leak surveys are only feasible during warmer times of the year. The Company cannot do leak surveys during that much of the winter, and leaking gas can migrate under frozen ground. A gas leak in an Avista Aldyl A main, followed by the gas migrating under frozen ground, is what led to the explosion in Odessa in December 2008. Two persons suffered significant injuries in that explosion, and significant property damage occurred.

Q. Does this conclude your testimony?

A. Yes.