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VIA: Electronic Mail

September 27, 2012

David Danner
Executive Director and Secretary
Washington Utilities & Transportation Commission
1300 S. Evergreen Park Drive S. W.
P.O. Box 47250
Olympia, Washington 98504-7250

Re: Pipeline Replacement Plans of Avista Utilities - Docket No. UG-120715

Dear Mr. Danner,

On May 18, 2012, the Washington Utilities and Transportation Commission (Commission) filed with the Code Reviser a Preproposal Statement of Inquiry (CR-101) to examine whether companies subject to the Commission's jurisdiction should do more to enhance the safety of their natural gas distribution systems and, if so, to develop appropriate requirements or incentives to accomplish that goal. The Commission issued a notice and is seeking written comments from interested persons on issues related to enhancing pipeline safety. The Commission received comments from interested parties and conducted workshops on June 21, 2012, and July 1, 2012.

On August 24, 2012, The Commission issued a Notice of Request for Pipeline Safety Plans and a Notice of Opportunity to Comment on Proposed Interim Cost Recovery Mechanisms. The Commission stated that they needed additional information before taking further action on pipeline integrity issues. Specifically, the Commission requested that (1) the

natural gas utilities provide pipeline replacement plans; and (2) interested parties provide additional comment on two mechanisms that Staff has proposed for interim recovery of costs incurred to accelerate replacement of higher risk pipe.

The Company appreciates the opportunity to provide in this filing a summary of the plans for its replacement programs for Priority Aldyl A pipe and Isolated Steel pipe. A summary of the plans is provided below, organized under the sections identified in the subject Notice:

A. Pipe of Concern in Avista's Natural Gas System

Protocol for Managing Priority Aldyl A Piping

Avista Utilities (Avista) has undertaken a twenty-year program to systematically remove and replace select portions of the DuPont Aldyl A medium density polyethylene pipe in its natural gas distribution system in the States of Washington, Oregon and Idaho. A report summarizing this program, titled: Proposed Protocol for Managing Select Aldyl A Pipe in Avista Utilities' Natural Gas System, is attached to this plan, as Attachment A[1]. None of the subject pipe is "high pressure main pipe," but rather, consists of distribution mains at maximum operating pressures of 60 psi and pipe diameters ranging from 1¼ to 4 inches. As part of this program, Avista will also re-make connections of Aldyl A service piping, ½ and ¾ inch diameters, where tapped to steel main pipe.

Nature of the Safety Risk - Early vintages of Aldyl A pipe produced for natural gas service from the 1960s through the early 1980s, including much of the same vintage polyethylene pipe manufactured by other companies, is subject to "premature brittle-like cracking." This failure process results from a premature loss of 'ductility' or flexibility in the pipe material, a fundamentally-important property of polyethylene piping. This loss in ductility allows small cracks to form on the inner wall of the pipe that eventually propagate through the pipe wall, resulting in failure. Unfortunately, early polyethylene piping tests presumed that the material

[1] The attachments associated with the "Proposed Protocol for Managing Select Aldyl A Pipe in Avista Utilities' Natural Gas System" report are not included in this filing, however they are available upon request from the Company.

had ductile properties and therefore did not foresee failures resulting from brittle-like behaviors, so the phenomenon was poorly understood for many years. This tendency for brittle-like cracking renders the pipe more susceptible to failure over time than newer-generation polyethylene pipe, and this tendency to fail increases with time.

Aldyl A Pipe in Avista's Natural Gas System – Avista has approximately 12,500 miles of natural gas piping of all types in its service territories in the States of Washington, Oregon and Idaho. Like most other gas utilities in the nation, Avista adopted plastic pipe as an excellent alternative to steel, and consequently, the broad majority of Avista's installed pipe is polyethylene (about 8,500 miles) of various types, ages and brands, including DuPont's Aldyl A. Avista began installing Aldyl A pipe in 1968 and continued its use into the early 1990s. Below, are three generalized classifications of Aldyl A pipe in Avista's system, ranging in diameters from ½" to 4", as reported in Avista's Protocol Report.

Pre-1973 Aldyl A (1965-1972 resins)	190 Miles
1973-1984 resins	960 Miles
1985-1990 resins	919 Miles

At Risk Aldyl A Piping – The timely application of Avista's Distribution Integrity Management approach to its recent and ongoing leak analysis, and its failure mode and reliability modeling results, conducted through the course of 2010 and 2011, prompted Avista to formulate a protocol to systematically manage classifications of the Aldyl A pipe in its natural gas system identified to be at risk of approaching unacceptable levels of reliability without prompt attention. These classifications, noted by Avista in its Protocol as "Priority Aldyl A" piping, include Aldyl A gas service connections tapped to steel main pipe (16,000 services – total system) and Pre-1973 & Pre-1984 Aldyl A main pipe (714 miles – total system).

Avista's Aldyl A Protocol is Timely – Avista believes the decision to formulate a program for its Priority Aldyl A pipe is both timely and prudent, and is consistent with results of our leak investigations, Integrity Management principles and the Call to Action of Department of Transportation Secretary LaHood to aggressively address high-risk pipeline infrastructure across the nation. The decision is also consistent with the prior federal bulletins on this subject and with the decisions of other similarly-situated utilities that have implemented similar pipe-

replacement programs. Finally, given the significant amounts of priority Aldyl A pipe on Avista's system, commencing a protocol now provides us greater opportunity to manage these facilities in a prudent and cost-effective manner.

Isolated Steel Identification & Replacement

Avista is currently engaged in an "identification & replacement program" related to isolated segments of steel pipe in its natural gas system. The genesis of this program was an agreement between Avista and the Safety Staff of the UTC, aimed at eliminating the risk associated with sections of isolated steel that were 'cathodically unprotected' or otherwise unknown to Avista (Docket PG-100049). The program objective is to find and document any isolated steel sections, including isolated risers, and to replace every section within a specified time after its identification.

Nature of the Safety Risk – Steel pipe that is cathodically unprotected is subject to corrosion to varying degrees, depending on pipe coating, type and condition, soil type and acidity, ground moisture, the presence of foreign utilities, and other factors. Corrosion causes the loss of metal from the pipe wall, which can result over time in a gas leak. This objective of this program is to remove any steel sections that could be subject to a lack of protection and such corrosion.

B. Scope and Rationale of Avista's Pipe Replacement Programs

Protocol for Managing Priority Aldyl A Piping

Optimizing the Replacement Program – Avista's application of its Distribution Integrity Management Plan demonstrated the relative risk associated with Priority Aldyl A pipe in its system, and pointed to the need for its replacement. But determining the appropriate length of time over which to replace the Priority Aldyl A pipe involved the optimization of several factors, including: 1) the overall urgency from a reliability and safety perspective, both present and forecast; 2) potential consequences; 3) the impact of more intensive leak survey methods to better identify priority facilities in need of replacement and in helping reduce the potential for harmful incidents; 4) the ability to effectively prioritize specific projects to better ensure

facilities in greatest need are addressed earliest; 5) the availability of equipment and labor resources needed to conduct the work, and the ability to coordinate the work with Avista's ongoing construction programs; 6) program efficiency, and 7) the degree of rate pressure placed on customers, both in absolute terms and in relation to other reliability and safety investments required across the natural gas and electric business. Ultimately, Avista must optimize these factors in a way that ensures the management and removal of its Aldyl A pipe is conducted in a way that shields our customers from imprudent risk, while at the same protecting them from the burden of unnecessary costs.

Setting the Initial Replacement Horizon – To help establish the appropriate time horizon for replacement of the Priority Aldyl A piping, Avista used reliability forecast modeling to understand the expected long-term reliability of this pipe, compared with that of steel and latest-generation polyethylene pipe. Reliability curves for gas piping were generated from input data that included pipe inventory information (type, brand, footage, location, soil conditions, etc.), current age of piping, historic and current failure information and repair data. Avista modeled various time horizons for the replacement program, up to a timeline of 30 years, and determined a replacement horizon in the range of twenty years to represent an optimum timeframe for removing and replacing its Priority Aldyl A pipe. Shortening the timeline was found to have increasing cost impacts to customers but with little improvement in the numbers of expected facility failures. Lengthening the timeline past twenty years, however, was found to result in a substantial increase in the number of material failures expected.

Using Prioritization to Mitigate Potential Risk – In addition, by using the Distribution Integrity Management model to prioritize work activities, Avista believes it can manage the forecast Aldyl A material failures in a way that significantly reduces their potential occurrence in areas that could result in harm. Under this approach, Avista believes it can prudently manage the replacement of priority Aldyl A pipe over twenty years with the goal to avoid harmful incidents, and at a reasonable rate impact for our customers.

Managing the Program in Real Time – Importantly, Avista's proposal for a 20-year replacement program represents an optimization based on the information we have available today. Any number of factors could change as the work proceeds over the first few years that could result in a 'new' optimum time horizon. Avista will be collecting new leak survey and other information

each year, and will continue to use its Asset Management models to further refine expected trends and potential for consequences, making program adjustments as appropriate.

Isolated Steel Identification & Replacement

Program Design – Avista's program was developed, prior to the institution of Distribution Integrity Management, as a programmatic approach to eliminate the potential risk associated with sections of isolated steel piping. As such, and since the program is carried out by stipulation with Safety Staff, it has not been subject to the pipeline threat assessment evaluations or risk-assessment methodologies described for Avista's Priority Aldyl A program. The method for identifying sections of isolated steel involves the survey of the natural gas system at systematic points that target all areas of interest in the system. The occurrence and amounts of isolated steel piping associated with each of the survey points determines the actual quantity of isolated steel to be removed. Avista has approximately 144,000 points to survey over the life of the program. To date, more than 39,000 points have been surveyed, resulting in the location of 2,517 isolated segments. Of these isolated segments, 2,075 had localized cathodic protection and 442 were unprotected (337 of the 442 had been replaced by September 24, 2012).

C. Estimated Costs for Avista's Pipe Replacement Programs

Protocol for Managing Priority Aldyl A Piping

Initial Estimates of Program Costs – Avista's analysis and planning effort in support of its Priority Aldyl A protocol was completed in the fall of 2011. Program costs at that time were projected based on the unit costs ($/foot of pipe replaced) derived from Avista's historical pipeline construction projects and its generalized knowledge of natural gas system construction. From that basis, the total program costs (for Priority Aldyl A in Avista's entire system) were estimated to be just over $10 million annually for the years 2013 – 2032 (excluding inflation). Avista will continue to refine its forecast of expected unit costs as it gains experience with the many factors affecting both existing and planned replacements. In addition, annual program

costs will vary with the characteristics of the piping system prioritized for replacement each year, among other factors, and the degree of annual inflation experienced over the life of the program.

Current Year and Expected Program Costs

Avista Priority Aldyl A Program Expected Costs (Washington)

Year	Expected Cost	Percent of Annual Budget
2012	$2,844,111	57%
2013	$4,786,530	58%
2014	$5,892,948	56%
2015	$4,869,061	45%

Isolated Steel Identification & Replacement

Estimates of Program Costs – The program duration is ten years, and the estimated cost for the entire program is $12.4 million. Avista expects annual spending amounts to be greater in the early years of the program as the highest-density areas are surveyed first, and then for costs to decrease correspondingly toward the ten-year horizon. Expected program costs for 2012 are $2.6 million, and annual spending varies with the actual number of isolated steel segments located during the systematic testing each year. Estimated cost for the years 2013 – 2015 is $1.8 million each year, for a total of $5.4 million.

D. Avista's Pipeline Threat Model and Methodology

Protocol for Managing Priority Aldyl A Piping

Understanding the Potential for Occurrence and Consequences of Leaks – As important as setting an appropriate replacement time horizon for prudently managing the reliability of Avista's Aldyl A piping, is the ability to effectively prioritize pipe-replacement activities in a

way that minimizes the potential for hazardous leaks. While the reliability modeling can assist in pointing to portions of Avista's system where we might expect to see the greatest occurrence of material failures, its results do not account for factors such as soil conditions or the proximity to buildings or people. Obviously, a leak occurring in a vacant field will have little, if any, consequence and will likely be detected and repaired during the next leak survey. By contrast, the potential hazard of a leak increases with its proximity to people and structures, so replacing pipe that has a high probability of leaking and is located in populated areas is first priority.

Avista's Priority Aldyl A Mapping Data – Avista has identified the locations of all natural gas pipe in its system, including all classifications of Priority Aldyl A piping. All piping is noted by geographic map location, installation year and pipe diameter, and along with other attributes, this information has been entered into Avista's geographic information system (GIS). Less than 1% of the piping in Avista's overall natural gas system is of "unknown" material. And, as a conservative measure, this unknown piping is assigned the same risk ranking as pre-1973 Priority Aldyl A, until such time it is confirmed to be other than Priority Aldyl A material.

Computing Risks for Each Segment of Aldyl A Pipe – Avista's Distribution Integrity Management approach provides the analytical tools that integrate key knowledge and information needed to effectively prioritize replacement activities based on the potential hazard. In the prioritization process, each segment of Aldyl A pipe in Avista's system is assigned a relative risk ranking, based on its age, material, soil conditions, construction methods, and its maintenance history. This 'risk' information has also been incorporated into the GIS database. The GIS gas system maps contain a "layer" of grid squares (50 feet per side) that overlay all portions of the piping in the system. Each of these squares is known as a "raster" and each raster contains all of the risk-related information that was loaded into the GIS system, as associated with the specific Aldyl A pipe at that precise geographic location.

Establishing the Priority Risk Rankings – In the next step, the software integrates the historic leak information for Aldyl A pipe on Avista's system with the risk data associated with each of the Aldyl A pipe segments, and predicts the geographic areas (by raster) where Aldyl A pipe failures are expected to be greatest. In the last step, the software integrates the results for expected failures with information for each risk raster that identifies the potential consequence of a leak on that segment (i.e. the proximity of that raster to buildings and people, and the

population density/sensitivity of those structures). The end result is a color-coding of the rasters that provides a visual picture of where on the gas system that both the potential likelihood of a leak, and the potential consequence of a leak, is greatest. This approach provides Avista with a comprehensive and objective means of identifying Aldyl A pipe that has the highest priority for replacement. From this risk analysis, Avista is then able determine how best to aggregate highest risk rasters on the system into an efficient replacement project (such as the town of Odessa) in order to provide the greatest risk reduction possible for a given effort.

E. Factors Influencing Avista's Pipe Replacement Programs

Protocol for Managing Priority Aldyl A Piping

Contract Resources – The federal mandate for Distribution Integrity Management Planning is driving an increase in major projects for distribution pipeline replacement across the natural gas industry. This, coupled with the recent boom in shale extraction and large-scale oil and gas field projects, has limited the availability of qualified workers. Local contractors supporting distribution pipeline companies, like Avista, are losing qualified workers to these boom projects, including operators, fitters and inspectors. Avista experienced this impact in April when its contractor lost several qualified workers to the projects in South Dakota, just as we were preparing to start work in Davenport. Longer-term commitments with contractors may be required in order to implement the volume of anticipated pipe replacement projects. In addition, contractors will lose qualified employees in the winter months unless the commitment is made to provide year-round employment. It will be in Avista's interest to ensure these contract crews remain trained and qualified, and have the incentive to continue providing support for our major gas-replacement programs.

Access and Permitting Challenges - Avista has gained valuable experience managing through various challenges during its recent pipe-replacement projects. The access-related challenges we expect to manage during the course of our pipe-replacement projects are as follows:

- Local Road-Cut Moratoria – can limit areas available for replacement due to time limits on pavement cutting, and significantly increase costs.
- Franchise Agreement - requirements, including timely notice, and right-of-way access, can significantly restrict the ability to perform work in a manner that diverges from an original project plan.
- Agency Public Works - review and approval process adds time to the project lifecycle and can impact the work schedule.
- Encroachment Permits – procurement adds time to the project lifecycle and can impact the planned work schedule.
- State Stormwater Pollution Prevention Plans – compliance adds time to the project lifecycle and can affect the anticipated work schedule.
- Local Work Restrictions – sometimes related to 'community events' or school zones, for example, can impact the ability to complete a project within a seasonal work cycle.
- Municipal Activity Restrictions - on volume of equipment, project noise and crew intensity will limit expected production. Avista's upcoming replacement project in the community of Talent, Oregon, will be constrained by the limitation that only two crews can be working in town at any given time, impacting project efficiencies and extending project lifecycles.
- Municipal Public Works – the availability of field utility locating can be a limitation.
- Pavement Cut Restoration - some requirements are onerous and very costly, particularly in Oregon, where cutting a 2-foot wide section of paving can require replacement of the full traffic lane. The result is pavement restoration costs that are 4-5 times the amounts necessary, quickly depleting project funds.
- Inspection Process/Protocol – a smooth process is critical to efficient field production.

Other Challenges – It's important, as mentioned above, to attempt to keep Avista's qualified contract crews in service year round. And the range of Avista's service territory, extending from North Idaho through Washington and into Southern Oregon, provides flexibility for year-round construction work in some areas. The challenge, however, is to schedule as much year-round work as possible, yet to do it in a manner that is congruent with the process for identifying high-

priority projects. Another challenge can be the aggregation of high-risk rasters into an efficient replacement project. The greater the density of high-risk rasters in a particular project, the greater will be the degree of risk reduction for a given project duration and cost.

F. Interim Safety Measures

Protocol for Managing Priority Aldyl A Piping

Annual Leak Surveys – Avista has implemented annual leak survey on all Priority Aldyl A mains in its entire service territory, and, has recently decided to increase the frequency of leak survey on Aldyl A services tapped to steel main pipe. In addition, as previously mentioned, Avista has assigned high-risk ratings to all of the limited segments of pipe of unknown material in its system.

Continuing Evaluation and Assessment – Finally, and importantly, Avista is continuing to gather and evaluate information such as leak survey results, material failure reports and exposed pipe reports in a continuing effort to refine the program. In particular, Avista wants to know if new data continues to support the initial replacement time horizon of twenty years and the decision not to replace Aldyl A service footage, or if changes in the protocol need to be made over time to prudently manage the risks associated with these facilities.

G. Annual Information / Progress Reports

Isolated Steel Program – Avista currently provides an update to the UTC Safety Staff on the progress of its Isolated Steel program during each of the regularly-scheduled quarterly update meetings held between Staff and the Company. For the Isolated Steel program, Avista proposes the current reporting format be continued.

Priority Aldyl A Program – In the interest of meeting the call for an annual informational report, Avista proposes it make an informational presentation to Staff each year on the status of its

Priority Aldyl A replacement Program, to be held during one of the regular quarterly update meetings. In the presentation Avista proposes to provide the following:

1) footage of Priority Aldyl A main pipe replaced, and the number of Aldyl A services tapped to steel main pipe remediated in the prior year;

2) a summary of the program costs for the prior year;

3) targets for main pipe to be replaced and services to be remediated in the coming year, including estimates of the expected cost;

4) a review of anticipated priority replacement projects for each of the coming three years, including estimated main footage to be replaced and service tees to be remediated, and

5) a review and discussion of any significant findings.

Avista appreciates the opportunity to submit a summary of it pipe replacement programs, and welcomes questions regarding this information to be directed to Larry La Bolle at 509-495-4710 or by email at larry.labolle@avistacorp.com.

Sincerely,

Kelly Norwood
Vice President, State & Federal Regulation
Avista Utilities