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PG-131839-RP

*Filed at WUTC via Web Portal*

May 31, 2013

Mr. Steven V. King, Acting Executive Director and Secretary  
Washington Utilities and Transportation Commission  
1300 South Evergreen Park Drive S.W.  
P.O. Box 47250  
Olympia, WA 98504-7250

**Re: Pipeline Replacement Program Plan and  
Special Pipe Replacement Program Cost Recovery Mechanism  
In accordance with Policy Statement in Docket No. UG-120715**

Dear Mr. King:

Enclosed for filing, in accordance with the Policy Statement issued in Docket No. UG-120715 ("Policy Statement"), please find Puget Sound Energy, Inc.'s ("PSE" or the "Company") 2013 Pipeline Replacement Program Plan ("PRPP") and a request for the opportunity to file a Special Pipe Replacement Program Cost Recovery Mechanism ("CRM") by August 1, 2013.

PSE's 2013 PRPP contains the following required elements: (1) a "master" plan for replacing all pipes with an elevated risk of failure; (2) a two-year plan that specifically identifies the pipe replacement program goals for the upcoming two year period; and (3) if applicable, a plan for identifying the location of pipe that presents elevated risk of failure.

At this time PSE is not filing a CRM, but requests that the Commission allow it the opportunity to file its 2013 CRM at a date no later than August 1, 2013. There are several factors that prompt PSE to request that the Commission allow it to file a possible CRM later than June 1, 2013, but by August 1, 2013. The following are some of those factors:

- 1) There are several important dockets pending before the Commission (UE-121697/UG-121705, UE-130137/UG-130138, and UE-121373), the outcome of which may influence whether PSE elects to file a CRM in 2013. It is PSE's practice to consider the impact on customers before it files a possible rate increase. PSE would like to await the final outcome of those pending dockets,



so that it may undertake a more informed consideration of the impact of a CRM on gas customers' rates and bills before filing the CRM.

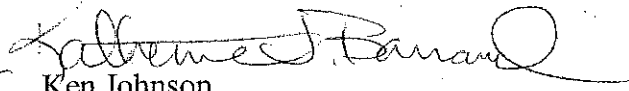
- 2) The filing of the CRM is in accordance with a Policy Statement and is not required by a law, rule, or Commission Order; therefore there is an element of flexibility for both the Commission and the gas companies around the filing date. PSE's request for the opportunity to file a 2013 CRM no more than two months after the time designated in the Policy Statement is fully within a reasonable boundary of flexibility inherent in this (and all) policy statements.
- 3) While the Commission did note that it anticipates a concurrent review process of the PRPP and the CRM, it also noted that the final approval of the CRM is contingent upon the approval of the PRPP.<sup>1</sup> Thus, a CRM filed on August 1 should not delay the review and approval of the PRPP, and may not delay consideration of the CRM, given that approval of the PRPP is a necessary prerequisite to the approval of the CRM.
- 4) The Commission had already contemplated that the CRM would be updated with projected costs in the August-September 2013 time frame:

The company will update the projected costs with actual investment incurred during May through July and revised costs estimates for August through October with its annual Purchased Gas Adjustment tariff filing. Once actual project cost data are available, a company will submit actual cost data through September and an updated estimate for October under the PGA docket for that year.<sup>2</sup>

Since the Commission had already contemplated that gas companies would file updates to the cost estimates in August or September, the Company's request to file a CRM by August 1, 2013, is not a significant departure from the process and timeline the Commission already outlined.

Thank you for your consideration of this request. If you have any questions about the information contained in this filing, please contact Kathie Barnard, Director, Revenue Requirements & Regulatory Compliance, at (425) 462-3716.

Sincerely,

*for*   
Ken Johnson  
Director, State Regulatory Affairs

Enclosures

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<sup>1</sup> Policy Statement at n. 30.

<sup>2</sup> Policy Statement at ¶ 69.



**Pipeline Replacement Program Plan**  
**Puget Sound Energy**  
**2013**

*in accordance with*  
**Policy Statement in Docket No. UG-120715**

## Required Contents: Checklist and Table of Contents

<b>Policy Statement</b>		<b>Section/Page</b>
<p>The pipe replacement program plan should consist of three parts:</p> <p>(1) a “master” plan for replacing all pipes with an elevated risk of failure;</p>	<p>In support of its pipe replacement program plan, each gas company should demonstrate that the type of pipe to be replaced under its program presents an elevated risk of cracking, leakage, breakage or other failure. The gas company should explain why the particular type(s) of pipe presents an elevated risk, such as the physical qualities of the pipe as manufactured (e.g., low ductile plastic pipe), the condition of the pipe as installed (e.g., poor soil conditions) or as maintained (e.g., no cathodic protection), the age of the pipe, etc.</p> <p>The gas company should also provide detailed analysis and explanation demonstrating why the pipe it seeks to replace is appropriate for replacement, compared to other pipe. To the extent practical, the gas company should quantify and explain the degree to which risk of failure is elevated for such pipe, compared to other pipe.</p>	<p><b>Section 1 -</b></p> <p>DuPont ALDYL “HD” Page 3</p> <p>Wrapped Steel Mains Page 7</p> <p>Wrapped Steel Services Page 9</p>
<p>(2) a two-year plan that specifically identifies the pipe replacement program goals for the upcoming two year period;</p>	<p>The first pipe replacement program plan shall be filed by June 1, 2013, covering planned pipe replacement through 2015.</p>	<p><b>Section 2</b></p> <p>DuPont ALDYL “HD” Page 6</p> <p>Wrapped Steel Mains Page 8</p> <p>Wrapped Steel Services Page 9</p>
<p>and (3) if applicable, a plan for identifying the location of pipe that presents elevated risk of failure.</p>	<p>A prudent pipe replacement program should contain a plan for identifying the location of elevated risk pipe; to the extent the gas company does not presently know the location. The plan should include a timetable under which the gas company will know the location of its elevated risk pipe.</p> <p>The Commission will not require a gas company to know the location of all of its elevated risk pipe as a prerequisite for having a pipe replacement program consistent with the policy statement. A pipe replacement program may focus initially on pipe for which the gas company knows the location.</p>	<p><b>Section 3 -</b></p> <p>DuPont ALDYL “HD” Page 6</p> <p>Wrapped Steel Mains Page 8</p> <p>Wrapped Steel Services Page 10</p>
<p>The pipe replacement program plan must be in the public interest</p>		<p><b>Section 4 -</b></p> <p>Page 10</p>

## **Introduction**

On December 31, 2012, the Washington Utilities and Transportation Commission filed a policy statement for the accelerated replacement of natural gas pipeline facilities with elevated risk. This policy statement requires each gas company requesting a special pipe replacement cost recovery mechanism (CRM) to file with the Commission a pipe replacement program plan containing the following elements:

1. *A "master" plan for replacing all pipes with an elevated risk of failure*
2. *A two-year plan that specifically identifies the pipe replacement goals for the upcoming two year period*
3. *A plan for identifying the location of pipe that presents elevated risk of failure*

In accordance with this policy statement, the following is PSE's proposed pipe replacement program plan for pipe that poses an elevated risk of failure. PSE continually analyzes the performance of its distribution system and documents the results of this analysis in the Continuing Surveillance Annual Report. Based on this analysis, PSE's distribution system is performing well. While the system is performing well as a whole, detailed analysis indicates some subsets of materials that have an elevated risk of failure. These subsets include bare steel, larger diameter older vintage plastic pipe (specifically the DuPont Aldyl "HD" plastic pipe), older vintage steel wrapped mains, and older vintage steel wrapped services.

PSE is on target to complete the replacement of bare steel piping by the end of 2014 in accordance with a settlement agreement. The settlement agreement details the target replacement plan and requires PSE to report progress to the WUTC. As a result, no additional information on the bare steel replacement plan is included with this filing. The sections below provide the information required by the policy statement for the DuPont Aldyl "HD" plastic pipe, older vintage steel wrapped mains, and older vintage steel wrapped services.

## **DuPont ALDYL "HD" Plastic Pipe**

### **Section 1 - Master plan for replacing pipe with an elevated risk of failure**

Through the Distribution Integrity Management Program (DIMP), PSE has identified an increased risk of premature, brittle-like cracking of the larger diameter (1 1/4" and larger) Aldyl "HD" plastic pipe. The Aldyl "HD" is a polyethylene (PE) resin that DuPont used to manufacture plastic pipe. PSE installed this pipe in the 1970s and early 1980s.

The brittle-like cracking is due to slow crack growth (SCG) at locations where there is a stress concentration. The failure is referred to as brittle-like cracking because it occurs without any localized plastic deformation. While the failure occurs without plastic deformation, the pipe is not brittle. Even when a failure occurs due to slow crack growth,

the PE pipe is still resistant to crack propagation preventing it from becoming a larger crack.

As part of its DIMP, PSE analyzes many aspects of system performance including leak trends and reports on these trends in the Continuing Surveillance Annual Report. A copy of the Continuing Surveillance Annual Report for 2012 is attached. This report highlights some important trends that provide insight into the cause of failures and the elevated risk of failures from the larger diameter DuPont pipe.

While leak repairs on DuPont pipe are less frequent than on steel pipe, the leaks repaired on older vintage PE main are more than twice as likely to be Grade "A" or "BA" leaks requiring immediate or next day repair than leaks repaired on older STW main or bare steel main. Specifically, the original grade of repaired leaks on older PE main are hazardous approximately 65% of the time compared to 30% and 20% on older STW main and bare steel main respectively. This trend provides insight into the elevated risk from leaks on older vintage PE mains.

The Continuing Surveillance Annual Report also highlights that brittle-like cracking on PE pipe is primarily due to rock impingement but also occurs where the pipe has been squeezed. The model used to prioritize replacement of DuPont Aldyl "HD" pipe assigns risk weightings to historical failures that may predict future failures including fusion failures, brittle-like cracking, and reports of rock in the vicinity of PE pipe.

PSE's experience with the larger diameter Aldyl "HD" material is similar to industry experience with many of the older PE materials. This is highlighted by many of the Safety Recommendations reports issued by the National Transportation Safety Board (NTSB) on April 30, 1998. These recommendations were based on findings from NTSB's investigation of PE pipe following several natural gas distribution accidents that involved plastic piping that cracked in a "brittle-like" manner. The following summarizes many of the issues identified in NTSB's investigation that correlate to PSE's experience with the DuPont Aldyl "HD" material:

- Nationally, brittle-like failures represent a frequent failure mode for older plastic piping.
- The procedure used to rate PE materials from the 1960s through the early 1980s may have overrated the materials long term strength and resistance to brittle-like cracking.
- The test methods used at the time did not reveal the susceptibility of many early PE materials to brittle-like cracking.
- Plastic pipe was assumed to perform in a ductile manner; therefore, plastic pipe design focused primarily on stress due to operating pressure. As a result, not much consideration was given to stress due to external loading as it was assumed that these stresses would be reduced by localized yielding.



- Experts in gas distribution plastic piping indicate that some of the PE pipe manufactured from the 1960s through the early 1980s has demonstrated poor resistance to brittle-like cracking. This occurs in some early vintage PE materials that have a lower slow crack growth resistance than other PE materials. Newer test methods more accurately predict the pipe's resistance to slow crack growth.

In addition to the Aldyl "HD", DuPont also manufactured a medium density PE pipe marketed under the name Aldyl "A". While PSE only purchased and installed the Aldyl "HD" pipe, information on both Aldyl "A" and Aldyl "HD" pipe is included in this filing to highlight the similarities and differences in the risks of these two materials. Similar to PSE's experience with Aldyl "HD", the Aldyl "A" pipe has been found to be susceptible to brittle-like cracking.

The Aldyl "A" pipe manufactured from 1970 through early 1972 had a manufacturing issue that resulted in a brittle inside surface also referred to as low ductile inner wall. This characteristic resulted in premature failures. In early 1972, DuPont US changed the manufacturing process to address the low ductile inner wall phenomena.

While only early 1970s vintage Aldyl "A" pipe had the LDIW inner surface, both Aldyl "HD" and later vintage Aldyl "A" have exhibited brittle failure characteristics in pipes 1 ¼" and larger in diameter. The smaller diameter piping is more flexible and not as susceptible to the brittle-like cracking experienced in larger diameters.

Both Aldyl "HD" and Aldyl "A" were made with state-of-the-art PE resins at the time of manufacture and met applicable industry standards and complied with federal regulations. However, by today's standards they both have low resistance to slow crack growth and are susceptible to SCG field failures. This is particularly true when these pipes are subjected to secondary loads, such as rock impingement and squeeze-off.

PSE plans to replace the larger diameter Aldyl "HD" pipe that poses an elevated risk of failure. PSE will continue to monitor the performance of the larger diameter Aldyl "HD" pipe to determine the appropriate timeframe for completing the replacement of this pipe. Based on historical performance, PSE currently plans to replace this pipe within 20 years beginning in 2013. PSE plans to increase the amount of pipe replaced each year in the first few years of the program and replace fewer miles per year in the last few years of the program. The plan is to replace approximately 100 miles of pipe in years one through five, 150 miles in years six through ten, 100 miles in years eleven through fifteen, and 50 miles in years sixteen through twenty. Based on this plan, PSE expects to spend approximately \$150 million in the first five years of the program, \$225 million in years six through ten, \$150 million in years eleven through fifteen, and \$75 million in years sixteen through twenty. These expenditures are in 2013 dollars and do not include AFUDC.

PSE will continue to monitor the performance of the Aldyl "HD" material and report on the trends in the Continuing Surveillance Annual Report. This targeted schedule may be modified to either further accelerate the pipe replacement or decelerate the replacement if

these trends indicate it is appropriate to adjust the replacement schedule. If any material changes are made to this plan, PSE will submit them to the Commission as required by the Commission's Policy Statement.

**Section 2: Two-year plan that specifically identifies the pipe replacement goals for the upcoming two year period**

Appendix A lists the Aldyl "HD" projects that are planned for completion in the current CRM year, 2013, as well as the current prioritization for projects in the CRM years 2014 and 2015. Adjustments to the specific projects may be made for a variety of reasons including new risk knowledge, permitting issues, customer issues, and public improvement opportunities. New projects will be substituted for any projects that are delayed with a goal to keep on track with the target replacement schedule discussed in the Master Plan.

**Section 3: A plan for identifying the location of pipe that presents elevated risk of failure**

PSE purchased and installed Aldyl "HD" pipe in the 1970s and early 1980s. During this timeframe, PSE primarily purchased and installed both Aldyl "HD" and Phillips M8000.

PSE's construction records indicate the location of the pipe as well as the material, size, and date the pipe was installed. The construction records did not capture the pipe manufacturer. As a result, PSE has developed and begun implementing a plan to identify the manufacturer of larger diameter PE pipe installed in the 1970s and early 1980s.

PSE estimates approximately 400 miles of Aldyl "HD" remain in service of which PSE has already identified 166 miles. This identification is based on post construction reports of pipe manufacturer. PSE plans to identify the remaining Aldyl "HD" pipe for all the candidate locations by the end of 2016. This is being accomplished by identifying PE pipe manufacturer when the pipe is exposed through normal operation and maintenance activities as well as targeted excavations of candidate pipe installations.

PSE had previously captured information on pipe manufacturer on the Exposed Pipe Condition Report and has recently implemented a new PE Pipe Report to continue capturing this information. This information is being recorded in a database and analyzed to identify locations where the pipe manufacturer is already known and areas that require targeted excavation to determine the manufacturer.

Targeted excavations shall be performed in accordance with the criteria specified below until Aldyl "HD" is identified. Once Aldyl "HD" is identified on any job, the targeted excavations are complete and the location will go on the list for planned replacement. Additional excavations may be performed as required to gather information to scope the

replacement job. If Aldyl “HD” is not identified on the initial targeted excavation, additional excavations will be performed until Aldyl “HD” is identified or all targeted excavations are complete per the following criteria:

- One positive non-Aldyl “HD” identification is required for each pipe size installed under the same job
- More than one positive identification of non-Aldyl “HD” is required for jobs that are greater than 1,000 feet in length
- PE services not off of candidate mains shall have at least one positive identification of non-Aldyl “HD”

These criteria will be evaluated and adjusted if necessary based on manufacturer data gathered through the ongoing replacement of the Aldyl “HD” and PE Pipe Reports.

Based on the information gathered to date as well as the current criteria for manufacturer identification, PSE expects to perform approximately 5,000 targeted excavations. The targeted excavations are being planned and prioritized considering many factors including risk and accessibility. Risk focuses on areas with higher consequence and accessibility focuses on completing work prior to paving activities and subsequent paving moratoriums. Additional planning considerations focus on maximizing efficiencies and productivity, minimizing costs, and minimizing impacts to municipalities and the general public.

Based on the existing information, PSE plans to complete the identification of the larger diameter Aldyl “HD” locations by the end of 2016. While PSE’s methodology prioritizes performing targeted excavations in the vicinity of paving improvements, existing paving moratoriums or significant changes in the number of targeted excavations required could result in a change to this schedule. PSE will submit any material changes to this plan as required by the Commission’s Policy Statement.

## **Wrapped Steel Mains**

### **Section 1 - Master plan for replacing pipe with an elevated risk of failure**

PSE has identified, through its Distribution Integrity Management Program (DIMP), an increased risk of leakage on some of the older steel wrapped mains. This risk is due to a combination of factors including corrosion, existing third party damage to the pipe coating, welds, and equipment including vintage valves. The majority of the wrapped steel mains are performing very well and we expect they will continue to reliably provide gas service for years to come. However, ongoing reviews of the distribution system continue to identify areas that have had leaks repaired, are experiencing new leaks, and have reports of corrosion and/or damaged pipe coating. These segments of main and the

associated service piping have an elevated risk of failure as indicated by the system performance data.

PSE plans to replace the wrapped steel mains and associated service pipe that is identified as having an elevated risk. As previously discussed, the majority of the wrapped steel mains are performing very well and we expect they will continue to reliably provide gas service for years to come. As a result, PSE's plan does not include replacing all steel wrapped pipes but only that pipe that presents an elevated risk of failure based on the system performance data.

The plan for replacing steel wrapped mains is driven by risk knowledge. Based on current risk knowledge, PSE expects to replace approximately 20 miles of steel wrapped main over the next 5 years. Based on this plan, PSE expects to spend approximately \$30 million replacing steel wrapped mains and associated services over the next 5 years. These expenditures are in 2013 dollars and do not include AFUDC.

PSE will continue to monitor the performance of the wrapped steel mains and report on the trends in the Continuing Surveillance Annual Report. Based on these trends, the replacement plan may be modified to either further accelerate main replacements or decelerate main replacements if these trends indicate it is appropriate to adjust the schedule. If any material changes are made to this plan, PSE will submit them to the Commission as required by the Commission's Policy Statement.

**Section 2: Two-year plan that specifically identifies the pipe replacement goals for the upcoming two year period**

Appendix B lists the wrapped steel main projects that are planned for completion in the current CRM year, 2013, as well as the current prioritization for projects in the CRM years 2014 and 2015. Adjustments to the specific projects may be made for a variety of reasons including new risk knowledge, permitting issues, customer issues, and public improvement opportunities. New projects will be substituted for any projects that are delayed with a goal to replace mains to with an elevated risk of failure.

**Section 3: A plan for identifying the location of pipe that presents elevated risk of failure**

The location of steel wrapped pipe that presents an elevated risk of failure is continually monitored by reviewing system information including corrosion leak repairs, active leak data, and exposed pipe condition reports. This system performance data will continue to be monitored to identify any new areas that present an elevated risk of failure.

## **Wrapped Steel Services**

### **Section 1 - Master plan for replacing pipe with an elevated risk of failure**

PSE has developed and implemented a program to assess the risks on wrapped steel services installed prior to 1972. Since this program began, more than 10,000 of the original population of approximately 100,000 services have been remediated. The majority of the remaining wrapped steel services are performing very well and we expect they will continue to reliably provide gas service for years to come. However, ongoing review of the risk factors indicates an elevated risk of failure for some of the services. These risk factors include services in casing where the gas carrying pipe within the casing may not be adequately protected from corrosion and services where a combination of risk factors such as inactive risers or buried meters increase the total risk.

PSE plans to replace the pre-1972 wrapped steel services with an elevated risk. As previously discussed, the majority of the wrapped steel services are performing very well and are expected to continue to reliably provide gas service for years to come. As a result, PSE's plan does not include replacing all steel wrapped services but only those that present an elevated risk of failure based on the risk knowledge. Based on current risk knowledge, PSE is targeting to replace approximately 1,100 services over the next 5 years. Based on this plan, PSE expects to spend approximately \$10 million replacing steel wrapped services over the next 5 years. These expenditures are in 2013 dollars and do not include AFUDC.

PSE will continue to monitor the performance of the pre-1972 wrapped steel services and report on the trends in the Continuing Surveillance Annual Report. This targeted schedule may be modified to either further accelerate service replacements or decelerate service replacements if these trends indicate it is appropriate to adjust the schedule. If any material changes are made to this plan, PSE will submit them to the Commission as required by the Commission's Policy Statement.

### **Section 2: Two-year plan that specifically identifies the pipe replacement goals for the upcoming two year period**

Appendix C lists the wrapped steel service projects that are planned for completion in the current CRM year, 2013. Adjustments to the specific services that will be replaced may be made for a variety of reasons including new risk knowledge, permitting issues, customer issues, and public improvement opportunities. New projects will be substituted for any projects that are delayed with a goal to replace services with an elevated risk of failure.

PSE plans to replace approximately 250 wrapped steel services in both the CRM years 2014 and 2015. These projects will be determined based on the results of the risk model that is updated annually with new risk knowledge as well as additional risk knowledge that is gained from on-going review of additional risk knowledge that is gained from on-

going review of wrapped steel service installation records. A list of these services will be completed by October 1<sup>st</sup> of the year proceeding planned replacement.

### **Section 3: A plan for identifying the location of pipe that presents elevated risk of failure**

PSE has identified the location of pre-1972 wrapped steel services and has recorded this information in a database. While this database is a useful tool in managing these services, PSE is working towards a plan to utilize the new geographic information system (GIS) as the data source for the ongoing identification and tracking of these services. This is targeted to be completed by the end of 2013.

Utilizing the GIS will facilitate data integration allowing additional risk information to be analyzed in conjunction with service data. Currently the risk information is available to identify locations where wrapped steel services have been installed in casing, have inactive risers, and have buried meters. This information is currently available in multiple databases and requires integration with the service location information. Once the GIS system is able to be used, there will be improved risk knowledge and tracking of wrapped steel service risks.

In accordance with distribution integrity management principles, PSE will continue to evaluate the risk of wrapped steel services. If additional risk factors are identified, these will be integrated into the remediation plan.

### **Section 4: The pipe replacement program plan must be in the public interest**

The pipe replacement plans for the DuPont Aldyl "HD" plastic pipe, older vintage steel wrapped mains, and older vintage steel wrapped services included in this filing have been developed considering many factors. These factors include:

- Improving the safety of the distribution system by replacing pipe based on the relative level of risk presented for each material and location
- Minimizing the replacement costs by maximizing efficiencies and productivity
- Minimizing the impacts to municipalities and the general public

**APPENDIX A1 - 2013 PLANNED DUPONT ALDYL "HD" PLASTIC PIPE REPLACEMENTS**

ADDRESS	CITY	FOOTAGE
309 S CLOVERDALE ST	SEATTLE	80
1026 MADISON ST	SEATTLE	1,285
13615 108TH AVE NE	KIRKLAND	350
79 110TH AVE SE	BELLEVUE	390
4 150TH PL NE	BELLEVUE	530
11014 HOLDEN RD SW	LAKESWOOD	1,665
1012 SW 41ST ST	RENTON	3,310
18801 ALDERWOOD MALL PKY	LYNNWOOD	1,145
12010 SE 212TH PL	KENT	1,950
12413 MERIDIAN AVE E	PUYALLUP	450
719 FRONTAGE RD	LAKE STEVENS	2,000
715 17TH ST SE	AUBURN	130
9450 NE 14TH ST	CLYDE HILL	105
18500 37TH AVE NE	LAKE FOREST PARK	195
3414 E LAKE SAMMAM PKWY SE	SAMMAMISH	425
501 S 336TH ST	FEDERAL WAY	475
14500 JUANITA DR NE	KENMORE	550
721 91ST AVE SE	LAKE STEVENS	4,170
1001 N BROADWAY	EVERETT	200
10894 GARDEN PL S	RENTON	105
11452 PARK AVE S	TACOMA	85
1911 39TH AVE E	SEATTLE	85
4202 90TH AVE SE	MERCER ISLAND	100
31717 PACIFIC HWY S	FEDERAL WAY	140
2308 POINT VIEW PL NW	GIG HARBOR	205
5303 PT FOSDICK DR NW	GIG HARBOR	145
17275 NE 67TH CT	REDMOND	410
1555 NW SAMMAMISH RD	RENTON	460
19426 116TH AVE SE	RENTON	250
1409 PUYALLUP ST	SUMNER	1,065
2337 SW 336TH ST	FEDERAL WAY	325
10115 172ND AVE NE	REDMOND	185
3630 CEDAR ST	TACOMA	75
2921 23RD AVE CT SE	PUYALLUP	490
3301 W DRAVUS ST	SEATTLE	400
14301 101ST PL NE	KIRKLAND	730
1111 RIVER RD E	PUYALLUP	415

7841 S 180TH ST	KENT	1,175
15055 NE 6TH ST	BELLEVUE	1,050
15909 71ST AVE NE	KENMORE	655
12804 84TH AVE CT E	PUYALLUP	690
2223 NE 23RD ST	RENTON	1,750
2810 10TH ST CT SE	PUYALLUP	2,810
11615 71ST AVE CT NW	GIG HARBOR	245
111 W HIGHLAND DR	SEATTLE	1,470
10334 SE 230TH PL	KENT	605
221 SW 139TH ST	BURIEN	780
6920 SEAWAY BLVD	EVERETT	2,153
16322 25TH AVE NE	SHORELINE	3,675
34815 WEYERHAEUSER WAY S	FEDERAL WAY	220



**APPENDIX A2 - 2014 PLANNED DUPONT ALDYL "HD" PLASTIC PIPE REPLACEMENTS**

ADDRESS	CITY	FOOTAGE
11725 PACIFIC HWY S	LAKESWOOD	SERVICE
10894 GARDEN PL S	RENTON	105
31717 PACIFIC HWY S	FEDERAL WAY	140
420 2ND ST NW	PUYALLUP	245
3803 NE 120TH ST	SEATTLE	130
12413 MERIDIAN AVE S	PUYALLUP	525
220 THURSTON AVE NE	OLYMPIA	180
1555 NW SAMMAMISH RD	ISSAQUAH	395
19426 116TH AVE SE	KENT	250
1 30TH ST NW	AUBURN	540
9839 NE 19TH ST	BELLEVUE	321
8234 CUSTER RD SW	LAKESWOOD	321
150 112TH AVE NE	BELLEVUE	SERVICE
3301 W DRAVUS ST	SEATTLE	400
7841 S 180TH ST	KENT	1,175
9306 NORTHWOOD DR SE	OLYMPIA	666
1026 MADISON ST	SEATTLE	1,285
425 S 7TH ST	RENTON	1,796
15226 71ST PL NE	KENMORE	1,255
10429 SE KENT KANGLEY RD	KENT	3,900
111 W HIGHLAND DR	SEATTLE	1,470
22027 120TH PL SE	KENT	3,710
9300 S SHERIDAN AVE	TACOMA	2,430
15305 NE 95TH ST	REDMOND	7,785
4529 186TH AVE SE	ISSAQUAH	1,270
6920 SEAWAY BLVD	EVERETT	SERVICE
1405 28TH AVE CT E	MILTON	905
2003 S 244TH PL	DES MOINES	535
512 E MAPLE ST	CENTRALIA	1,430
2501 S 156TH ST	SEATAC	3,645
2210 TANDEM CT SE	OLYMPIA	2,220
3111 SE 20TH CT	RENTON	1,925
10806 SE 220TH PL	KENT	1,600
5600 S JUNETT ST	TACOMA	2,040
104 17TH AVE S	SEATTLE	4,200
9101 STEILACOOM RD SE	OLYMPIA	3,290
8721 192ND ST SW	EDMONDS	980

**APPENDIX A3 - 2015 PLANNED DUPONT ALDYL "HD" PLASTIC PIPE REPLACEMENTS**

ADDRESS	CITY	FOOTAGE
16007 NE 27TH ST	BELLEVUE	1,260
1616 169TH PL SW	LYNNWOOD	1,210
32000 10TH PL SW	FEDERAL WAY	4,580
7250 S 227TH PL	KENT	5,390
15500 WALLER RD	TACOMA	1,022
9811 36TH DR SE	EVERETT	4,370
1688 S 348 ST	FEDERAL WAY	665
941 4TH AVE N	KENT	2,275
19256 SE 49TH ST	ISSAQUAH	1,850
6501 208TH ST SW	LYNNWOOD	2,200
1229 S MOORLANDS DR	TACOMA	1,940
2613 43RD ST SE	PUYALLUP	1,090
330 160TH PL SE	MILL CREEK	3,635
4456 50TH AVE SW	SEATTLE	235
8053 MERIDIAN AVE N	SEATTLE	3,540
18433 135TH PL SE	KENT	1,513
18438 SE 247TH PL	COVINGTON	2,470
2901 115TH AVE NE	BELLEVUE	1,585
15919 SE 182ND PL	RENTON	1,670
11254 20TH AVE S	SEATTLE	1,565
1717 MONTEREY AVE. NE	RENTON	895
3326 161ST AVE SE	BELLEVUE	4,000
15200 38TH AVE E	TACOMA	7,280
21235 SE 29TH ST	SAMMAMISH	1,945
12241 MAIN ST	BELLEVUE	1,255
8200 BRIDGEPORT WAY SW	LAKESIDE	1,875
768 222ND PL NE	SAMMAMISH	1,920
7026 CLEOPATRA PL NW	SEATTLE	1,680
26427 CARNABY WAY	KENT	2,640
5000 S 180TH PL	SEATAC	2,205
4111 119TH ST CT NW	GIG HARBOR	3,135
2409 SE 21ST ST	RENTON	1,500
811 33RD ST	EVERETT	4,210
11320 16TH AVE CT NW	GIG HARBOR	1,780
7001 NE 164TH ST	KENMORE	4,565
12725 LAKE CITY WAY NE	SEATTLE	1,100

4529 110TH AVE NE	KIRKLAND	870
25505 120TH PL SE	KENT	5,280
16308 SE 46TH WAY	BELLEVUE	3,845
901 S JUNETT ST	TACOMA	2,440
18513 BLUE RIDGE DR	LYNNWOOD	5,090
34120 30TH AVE SW	FEDERAL WAY	7,925
13103 130TH AVE CT E	PUYALLUP	8,230
4272 WHITMAN AVE N	SEATTLE	15,560
8106 10TH AVE S	SEATTLE	10,520
12210 WILLOWS RD NE	REDMOND	2,600
4233 204TH AVE NE	SAMMAMISH	9,055

**APPENDIX B1 - 2013 PLANNED WRAPPED STEEL MAIN REPLACEMENTS**

<b>ADDRESS</b>	<b>CITY</b>	<b>FOOTAGE</b>
1400 S 259 ST	DES MOINES	3,585
24810 136 AVE SE	KENT	,740
13313 SE FAIRWOOD BLVD	RENTON	1,590
331 234 PL SW	BOTHELL	540
25211 32 PL S	KENT	2,575
18127 42 PL W	LYNNWOOD	1,300
23311 2 AVE W	BOTHELL	870
2614 183 AVE NE	REDMOND	1,340
21411 44 AVE W	MLT	350
12554 SE 231 ST	KENT	315
18931 33 AVE S	SEATAC	850
5206 200 ST SW	LYNNWOOD	330
5251 SANDPOINT WAY NE	SEATTLE	3,350

**APPENDIX B2 - 2014 PLANNED WRAPPED STEEL MAIN REPLACEMENTS**

<b>ADDRESS</b>	<b>CITY</b>	<b>FOOTAGE</b>
3849 NE 98 ST	SEATTLE	675
420 128 AVE NE	BELLEVUE	2,725
SE 56TH ST & I-405	BELLEVUE	320
3957 SW 324 ST	FEDERAL WAY	940
74 ST & I-5	EVERETT	460
800 144TH PL SE	BELLEVUE	1,345
6000 78 AVE SE	MERCER ISLAND	2,690
6500 SAND POINT WAY NE	SEATTLE	1,600
8200 SE 61 ST	MERCER ISLAND	1,355
3600 220 PL SW	MOUNTLAKE TERRACE	1,937
23400 48 AVE W	MOUNTLAKE TERRACE	355
21700 51 AVE W	MOUNTLAKE TERRACE	660
700 14 ST SW	PUYALLUP	516
4200 189 PL SW	LYNNWOOD	650
4200 191 ST SW	LYNNWOOD	590
10200 WOODINVILLE DR	BOTHELL	870
8400 NE 20TH ST	CLYDE HILL	380
4100 223 ST SW	MOUNTLAKE TERRACE	1,000
20200 60 AVE NE	KENMORE	900

**APPENDIX B3 - 2015 PLANNED WRAPPED STEEL MAIN REPLACEMENTS**

<b>ADDRESS</b>	<b>CITY</b>	<b>FOOTAGE</b>
5475 NE 200 PL	LAKE FOREST PARK	865
10049 41 AVE NE	SEATTLE	560
10050 43 PL NE	SEATTLE	130
1145 S 216 ST	DES MOINES	860
3926 180 PL SW	LYNNWOOD	800
1519 218 ST SW	SEATTLE	800
1363 184TH AVE NE	BELLEVUE	480
8700 NE 139TH ST	KIRKLAND	1,817
20810 124 AVE SE	KENT	5,641
12624 SE 202 PL	RENTON	2,677
22600 227TH ST SW	MOUNTLAKE TERRACE	670
21600 49 PL W	MOUNTLAKE TERRACE	2,100
19000 40 AVE W	LYNNWOOD	598
22800 76 AVE W	EDMONDS	1,575
18606 48 AVE W	LYNNWOOD	685

**APPENDIX C - 2013 PLANNED WRAPPED STEEL SERVICE REPLACEMENTS**

ADDRESS	CITY
10113 98TH ST SW	LAKEWOOD
1017 28TH ST SE	AUBURN
102 O ST NE	AUBURN
1020 S 43RD ST	TACOMA
10202 112 ST SW	LAKEWOOD
10202 87 AVE SW	LAKEWOOD
1023 1023 SUNSET WAY	BELLEVUE
10338 BEDFORD CT	SEATTLE
104 130 AVE SE	BELLEVUE
1050 S 140 ST	BURIEN
10524 SE 226TH ST	KENT
10904 SE 235TH PL	KENT
10909 SE 236TH ST	KENT
10920 SE 236TH ST	KENT
11018 DEEPWOOD DR SW	LAKEWOOD
11045 PHINNEY AVE N	SEATTLE
1105 PARK ST	SUMNER
11307 WOODLAND AVE E	PUYALLUP
11512 SE 254TH PL	KENT
11726 AURORA AVE N	SEATTLE
1201 PACIFIC AVE	TACOMA
12130 SE 160TH ST	RENTON
12401 VINE MAPLE DR SW	LAKEWOOD
12612 BLAKELY PL NE	SEATTLE
12613 SE 4 PL	BELLEVUE
12700 LAKECITY WAY	SEATTLE
129 CHRISTINA DR	SUMNER
1302 N ALDER	TACOMA
1310 SKYLINE TERRACE NW	OLYMPIA
1408 BLAINE AVE NE	RENTON
1412 3RD ST SE	AUBURN
14135 83RD PL NE	BOTHELL
1437 BISHOP RD	CHEHALIS
14401 DURYEA LN S	TACOMA
1503 3RD ST SE	AUBURN
1512 S 53RD ST	TACOMA

15232 NE 3RD PL	BELLEVUE
15326 OLD REDMOND RD	REDMOND
1539 168 AVE NE	BELLEVUE
16010 5 AVE NE	SHORELINE
162 CHERRY LN SE	OLYMPIA
16301 NE 18TH ST	BELLEVUE
16305 126TH AVE SE	RENTON
16400 4 AVE NE	SHORELINE
1658 S 25TH ST	TACOMA
1660 S 42ND ST	TACOMA
17024 129TH AVE SE	RENTON
18828 129 PL SE	RENTON
1905 R ST NE	AUBURN
19552 38 AVE NE	LAKE FOREST PARK
19832 5TH AVE NW	SEATTLE
20024 MERIDIAN PL N	SHORELINE
2011 5TH AVE	SEATTLE
20810 124TH AVE SE	KENT
2118 S WILKESON ST	TACOMA
2119 172ND AVE NE	BELLEVUE
212 5TH AVE SW	PACIFIC
21201 97 PL S	KENT
21348 103 PL SE	KENT
2208 HISTORIC WAY	PUYALLUP
22330 114TH PL SE	KENT
22609 56 AVE W	MOUNTLAKE TERRACE
23205 67TH AVE W	MOUNTLAKE TERRACE
240 SW JAMES ST	CHEHALIS
244 10TH AVE	KIRKLAND
247 SW JAMES ST	CHEHALIS
2520 CEDAR ST	EVERETT
2526 VISTA PL SE	OLYMPIA
25730 16 AVE S	DES MOINES
2641 S 227TH PL	DES MOINES
2814 NE 8TH ST	RENTON
2933 14 AVE SE	AUBURN
29638 41ST PL S	AUBURN
29653 43RD PL S	AUBURN
300 AIRPORT WAY	RENTON
3052 NE 96 ST	SEATTLE
3281 36TH AVE SW	SEATTLE



33 1 AVE N	ALGONA
3507 SHELBY RD	LYNNWOOD
3633 44TH AVE SW	SEATTLE
3717 S 126TH ST	SEATTLE
3735 S AINSWORTH AVE	TACOMA
3815 196 ST SW	LYNWOOD
3822 NE 190TH PL	SEATTLE
4003 224TH PL SW	MOUNTLAKE TERRACE
401 ANDOVER PARK E	SEATTLE
4054 19TH AVE SW	SEATTLE
407 S 50TH ST	TACOMA
4107 SW KENYON ST	SEATTLE
411 SCHOOL CT SE	LACEY
4136 N 37TH ST	TACOMA
416 N L ST	TACOMA
417 VIKING ST SE	LACEY
4230 S 116TH ST	TUKWILA
4231, 4301 182 PL SW	LYNNWOOD
439 38TH AVE NE	OLYMPIA
4502 222ND ST SW	MOUNT LAKE TERRACE
4520 S 290 ST	AUBURN
4618 S OTHELLO ST	SEATTLE
4710 S LUCILE ST	SEATTLE
4715 S 295TH PL	AUBURN
5027 21ST AVE SE	LACEY
5106 S 3RD AVE	EVERETT
514 10TH ST SE	PUYALLUP
519 3RD ST NE	PUYALLUP
5236 E B ST	TACOMA
53 SW SUNSET BLVD	RENTON
552 129TH AVE SE	BELLEVUE
5527 S ORCAS ST	SEATTLE
5616 MILWAUKEE AVE	PUYALLUP
5705 S DAWSON ST	SEATTLE
6831 TOPAZ DR SW	LAKESWOOD
6026 32ND AVE S	SEATTLE
607 MORRIS AVE S	RENTON
615 MORRIS AVE S	RENTON
6212 36 AVE SE	SEATTLE
6231 ISLAND CREST WAY	MERCER ISLAND
6312 185 PL SW	LYNNWOOD

640 1ST ST SW	AUBURN
6585 123RD AVE SE	BELLEVUE
6711 W MERCER WAY	MERCER ISLAND
6725 162ND PL SW	LYNNWOOD
6815 S ALDER ST	TACOMA
6824 S PARK AVE	TACOMA
700 BARCLIFT LN SE	OLYMPIA
7027 125TH AVE SE	NEWCASTLE
726 FREDERICK ST SE	OLYMPIA
733 143RD PL SE	BELLEVUE
7341 125TH PL SE	RENTON
7703 BOBCAT DR SE	LACEY
8003 NNE 203 ST	KENMORE
8008 8008 NE 142ND PL	BOTHELL
8016 S 116TH ST	SEATTLE
8044 38TH AVE NE	SEATTLE
810 27TH AVE	SEATTLE
8106 MAPLE AVE SE	SNOQUALMIE
811 MAIN ST	SULTAN
8123 27TH AVE SW	SEATTLE
8207 38TH AVE NE	SEATTLE
8228 S 206TH ST	KENT
825 140TH AVE SE	BELLEVUE
83 SW MCFADDEN AVE	CHEHALIS
8404 CUSTER RD SW	LAKESWOOD
8536 S 115 PL	SEATTLE
8606 16TH AVE S	SEATTLE
8658 10TH AVE SW	SEATTLE
90 NE WASHINGTON AVE	CHEHALIS
9264 57TH AVE S	SEATTLE
927 N 93RD ST	SEATTLE
9344 53 AVE S	SEATTLE
9401 26TH AVE SW	SEATTLE
9405 28TH ST CT E	PUYALLUP
9407 26TH AVE SW	SEATTLE
9431 S 248TH ST	KENT
9609 22ND AVE NW	GIG HARBOR
9810 S 210 PL	KENT